KENVIRONS

Case No. 2018-00066

CONTRACT DOCUMENTS AND SPECIFICATIONS

CONTRACT 1: PITTSBURG LIFT STATION & FORCE MAIN EXTENSIONS

WOOD CREEK WATER DISTRICT
LAUREL COUNTY, KENTUCKY

PREPARED BY:

KENVIRONS, INC.
452 VERSAILLES ROAD
FRANKFORT, KY 40601

PROJECT NO. 2016087

OCTOBER 2017

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SECTION 00100
ADVERTISEMENT FOR BIDS

Wood Creek Water District
Contract 1: Pittsburg Lift Station & Force Main Extensions
Contract 2: Individual Grinder Pumps

Separate Sealed BIDS for the construction of Contract 1: Pittsburg Lift Station & Force Main Extensions and the purchase of Contract 2: Materials Purchase Contract - Individual Grinder Pumps & Portable Generator will be received by the Wood Creek Water District, 1670 Hal Rogers Parkway, London, KY 40743 until _____, 2017 at _____ P.M local time and then publicly opened and read aloud at the District's Office.

Contract 1 consists of installing approximately 8,800 L.F. of 2" and 3" PVC sewer force main, and constructing a new 700 gallons per minute lift station and all necessary appurtenances. Contract 2 consists of the purchase and delivery of 300 individual grinder pumps with control panels, a portable trailer mounted generator and all necessary appurtenances.

The CONTRACT DOCUMENTS may be examined at the following locations:
WOOD CREEK WATER DISTRICT, 1670 HAL ROGERS PARKWAY, LONDON, KY 40743
KENVIRONS, INC., 452 VERSAILLES ROAD, FRANKFORT, KY 40601

Copies of the CONTRACT DOCUMENTS may be obtained from Lynn Imaging, 328 Old Vine Street, Lexington, KY 40507 (859-226-5850) and www.lynnimaging.com upon payment of a nonrefundable price of $200.00 for Contract 1 and $100.00 for Contract 2 for each set plus any shipping charges.

Each Bidder must accompany his bid with a Bid Bond in amount of not less than five (5) percent of the base bid. No Bidder may withdraw his bid for a period of ninety (90) days. The Bidder awarded the contract shall execute a 100% Performance Bond and a 100% Payment Bond and shall furnish insurance as required, in the General Conditions. This contract shall be completed within 60 calendar days after date of authorization to start work. Liquidated damages will be $800 per calendar day.

Bidders must comply with the President's Executive Order Nos. 11246 and 11375, which prohibit discrimination in employment regarding race, creed, color, sex, or national origin. Bidders must comply with Section 3, Section 109, Title VI of the Civil Rights Act of 1964, the Anti-Kickback Act and the contract Work Hours Standard Act. Bidders must certify that they do not, and will not, maintain or provide for their employees any facilities that are segregated on a basis of race, color, creed, or national origin.

Any bid that is obviously unbalanced may be rejected. The Wood Creek Water District reserves the right to reject any and all bids and waive informalities.

Small, minority and women's businesses and labor surplus area firms are encouraged to bid this project.

By: Glenn Williams, Chairman
Wood Creek Water District

SECTION 00200
INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

ARTICLE 1 - DEFINED TERMS

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

A. Issuing Office--The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents in the number and for the non-refundable deposit sum, if any, stated in the Advertisement for Bids may be obtained from the Issuing Office.

2.02 Complete sets of Bidding Documents must 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. The Owner may make such investigations as deemed necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such

information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein in a timely manner. Conditional bids will not be accepted.

B. Bidder and any subcontractors the bidder uses must be acceptable to the Owner and have current eligibility for federal programs.

C. Approval of any proposed subcontract award can not be given by the Owner unless and until the proposed subcontractor has submitted the Certifications and/or other evidence showing that it has fully complied with any reporting requirements to which it is or was subject.

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

4.01 Subsurface and Physical Conditions

A. The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Bidding Documents.

2. Those drawings of physical conditions in or relating to existing surface and subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Bidding Documents.

B. Copies of reports and drawings referenced in paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in paragraph 5.03 of the General Conditions has been identified and established in paragraph 5.03 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

4.02 Underground Facilities

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

4.03 Hazardous Environmental Condition

A. The Supplementary Conditions identify those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that Engineer has used in preparing the Bidding Documents.

B. Copies of reports and drawings referenced in paragraph 4.03.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in paragraph 5.06 of the General Conditions has been identified and established in paragraph 5.06 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

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 excavation and utility locates.

4.06 Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such other work.

4.07 It is 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, or 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 5.05 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 for 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 Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 - PRE-BID CONFERENCE

5.01 A pre-Bid conference will not be held.

ARTICLE 6 - SITE AND OTHER AREAS

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

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than five days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

ARTICLE 8 - BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 % of Bidder's maximum Bid price and in the form of a certified check 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 10 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 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

8.03 Bid security of other Bidders whom OWNER believes do not have a reasonable chance of receiving the award will be returned within seven days after the Effective Date of the Contract or 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

ARTICLE 9 - CONTRACT TIMES

9.01 The number of days within which, or the date by which, the Work is to be substantially completed. Upon substantial completion, if necessary, a date for final completion and payment should be determined between the Owner, Contractor and Engineer based on remaining work, market and weather conditions.

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 for the work, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or equal" or substitute materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or equal" or substitute unless written request for approval has been submitted by the Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids in the case of a proposed substitute and 5 days prior in the case of a proposed "or equal". Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of merit of the proposed item is upon the Bidder. Engineer's decision of approval or disapproval of proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner. Substitutes and "or-equal" materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.04 and 7.05 of the General Conditions after the Effective Date of the Contract.

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

11.03 If award is made, Contractor shall be allowed to submit proposed substitutes and "or equals" in accordance with the General Conditions.

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 If required by the bid documents, 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 and Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in paragraph 6.06 of the General Conditions.

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

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

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

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

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 by printing in ink or by typewriter and the Bid signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid From. A Bid price shall be indicated for each Bid 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. If required by State where work is to be performed, the corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporation business 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 business 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 business address of the firm must be provided on the Bid Form.

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 business address of the joint venture must be provided on the Bid Form.

13.08 All names shall be typed or printed in ink below the signatures.

13.09 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.

13.10 The address and telephone number for communication regarding the Bid shall be shown.

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

ARTICLE 14 - BASIS OF BID; COMPARSION 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.

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 Bid Form is to be completed and submitted with all the attachments required.

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. A mailed Bid shall be addressed to Owner at address in Article 1.01 of Bid Form.

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 major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for 90 days.

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 or prior to the Notice of Award.

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

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

19.06 If the Contract is to be awarded, Owner will award the Contract to the responsible Bidder whose Bid, conforming with all the material terms and conditions of the Instructions to Bidders, is lowest in price and in the best interest of the Owner by considering other factors such as work history, recommendations, etc.

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 must 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 10 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 United States Department of Agriculture, Rural Development (RD). Refer to SC 19 of Supplementary Conditions for information on the Federal Requirements.

SECTION 00410
BID FORM

Project Identification: Pittsburg Lift Station & Force Main Extensions

Contract Identification and Number: 1

ARTICLE 1 - BID RECIPIENT

1.01 This Bid Is Submitted To: Wood Creek Water District, 1670 Hal Rogers Parkway, P.O. Box 726, London, KY 40743

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

ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

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

ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, 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 SC-4.02, and (2) reports and drawings of a Hazard Environmental Condition, if any, which has been identified in SC-4.06.

E. Bidder has obtained and carefully studied (or accepts the consequences for 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 the Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times 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 correlated 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. 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.

J. 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.

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

ARTICLE 4 - FURTHER REPRESENTATIONS

4.01 Bidder further represents that:

A. This Bid is genuine and not made in the interest of or on the 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 sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

ARTICLE 5 - BASIS OF BID

5.01 This project is consists of a Base Project. Each bidder will need to fill out the bid schedule for the Base Project. The same unit price shall be used for each Alternate.

5.02 The Total Base Bid will be determined by adding the bid prices for the Base Project. The low bid determination will be based on the Total Base Bid.

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

BASE PROJECT:

No.	Item Description	Unit	Quantity	Unit Price	Item Price
1	3" PVC SDR-17 Force Main	LF	1,700	_____	_____
2	3" HDPE, DR-17 Force Main	LF	300	_____	_____
3	2" PVC SDR-17 Force Main	LF	6,850	_____	_____
4	Bored Encasement for 3" Pipe	LF	40	_____	_____
5	Open Cut Encasement for 3" Pipe	LF	25	_____	_____
6	Bored Encasement for 2" Pipe	LF	60	_____	_____
7	4" x 2" Tie-In	EA	1	_____	_____
8	3" x 2" Tie-In	EA	1	_____	_____
9	3" Stub-Out	EA	2	_____	_____
10	Air Release Valve	EA	3	_____	_____
11	End Line Clean-Out	EA	4	_____	_____
12	Pittsburg Lift Station	LS	1	_____	_____
13	Free Bore	LF	500	_____	_____
14	Pavement Replacement			_____	_____
	14a. Crushed Stone	LF	200	_____	_____
15	Telemetry Allowance	LS	1	$17,500.00	$17,500.00
	Total Base Bid				$_____

A. Unit Prices have been computed in accordance with paragraph 13.03.A of the General Conditions.

B. 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 in accordance with Paragraph 14.04 of the General Conditions on or before the date, or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the work within the Contract Times.

ARTICLE 7 - ATTACHMENTS TO THIS BID

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

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

B. If Bid amount exceeds $10,000, signed Compliance Statement (RD 400-6). 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 Tier Covered Transactions (AS-1048);

D. If Bid amount exceeds $100,000, signed RD Instruction 1940-Q, Exhibit A-1, Certification for Contracts, Grants and Loans. Refer to the Supplementary Conditions.

ARTICLE 8 - DEFINED TERMS

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

ARTICLE 9 - BID SUBMITTAL

9.01 This Bid submitted by:

Name (typed or printed): _____ SEAL, if required by State

By: _____
(Individual's signature)

Doing business as: _____

Bidder's Business address: _____

_____

Business Phone No. (_____)_____

Business FAX No. (_____)_____

Business E-Mail Address _____

State Contractor License No. _____. (If applicable)

Employer's Tax ID No. _____

Phone and FAX Numbers, and Address for receipt of official communications, if different from Business contact information:

_____

_____

9.02 Bid submitted on _____, 2017.

SEAL, if required

Section 00430
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): Wood Creek Water District
1670 Hal Rogers Parkway
P.O. Box 726
London, KY 40743

BID
Bid Due Date:
Project (Brief Description Including Location): Contract 1: Pittsburg Lift Station & Force Main Extensions
Laurel County, Kentucky

BOND
Bond Number:
Date (Not later than Bid due date):
Penal sum _____ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

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

Note: Above addresses are to be used for giving required notice.

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 Surety's liability.

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

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

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

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

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

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

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

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

CERTIFICATION FOR CONTRACTS, GRANTS AND LOANS

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant or Federal loan, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant or loan.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant or loan, the undersigned shall complete and submit Standard Form - LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including contracts, subcontracts, and subgrants under grants and loans) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

_____ _____

(name) (date)

_____

(title)

oOo

U.S. DEPARTMENT OF AGRICULTURE

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION - LOWER TIER COVERED TRANSACTIONS

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 7 CFR Part 3017, Section 3017.510, Participants' responsibilities. The regulations were published as Part IV of the January 30, 1989, Federal Register (pages 4722-4733). Copies of the regulations may be obtained by contacting the Department of Agriculture agency with which this transaction originated.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it not its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name | PR/Award Number or Project Name

Name(s) and Title(s) of Authorized Representative(s)

Signature(s) | Date

Instructions for Certification

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later than determined that the prospective lower tier participant knowingly
rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transactions," debarred," "suspended," "ineligible,", "lower tier covered transactions," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

USDA
Form RD 400-6
(Rev. 4-00)

Form Approved
OMB No. 0575-0018

COMPLIANCE STATEMENT

This statement relates to a proposed contract with _____

_____

(Name of borrower or grantee)

who expects to finance the contract with assistance from either the Rural Housing Service (RHS), Rural Business-Cooperative Service (RBS), or the Rural Utilities Service (RUS) or their successor agencies, United States Department of Agriculture (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance). I am the undersigned bidder or prospective contractor, I represent that:

1. ☐ I have ☐ have not, participated in a previous contract or subcontract subject to Executive 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.

2. If I have participated in such a contract or subcontract, ☐ I have, ☐ have not, filed all compliance reports that have been required to file in connection with the contract or subcontract.

If the proposed contract is for $50,000 or more and I have 50 or more employees, I also represent that:

3. ☐ I have, ☐ have not previously had contracts subject to the written affirmative action programs requirements of the Secretary of Labor.

4. If I have participated in such a contract or subcontract, ☐ I have, ☐ have not developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required of me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to either the RHS, RBS or RUS, or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and wash rooms, restaurants and other eating areas time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications for proposed subcontractors for specific time periods) I will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods): (See Reverse).

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR CERTIFICATIONS OF NON-SEGREGATED FACILITIES

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, may 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding $ 10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date _____

_____

(Signature of Bidder or Prospective Contractor)

_____

Address (including Zip Code)

SECTION 00510

NOTICE OF AWARD

To: _____
_____
_____
_____

PROJECT Description: Contract 1: Pittsburg Lift Station & Force Main Extensions

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, 2017 and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of $_____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

Within ten (10) days of your compliance of 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

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this ___ day of _____, 2017.

Wood Creek Water District
Owner

By: _____

Title: Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____ _____ this the _____ day of _____, 2017.

By: _____

Title: _____

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

THIS AGREEMENT is by and between Wood Creek Water District ("Owner") and

_____ ("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

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

Contract 1: Pittsburg Lift Station & Force Main Extensions

ARTICLE 2 – THE PROJECT

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

Contract 1: Pittsburg Lift Station & Force Main Extensions

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Kenvirons, Inc.

3.02 The Owner has retained Kenvirons, 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 **60** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment at a date determined by Owner, Contractor, and Engineer after substantial completion, based on remaining work, weather and market conditions.

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 within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract.

1. Substantial Completion: Contractor shall pay Owner **$800** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.

ARTICLE 5 – CONTRACT PRICE

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

A. For all Work, at the prices stated in Contractor's Bid, attached in Section 00410.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

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

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 25th 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; and

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

B. Upon Substantial Completion of the entire construction to be provided under the Contract Documents, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed, plus any reduction in retainage that has been agreed upon by Owner, Contractor, and Engineer.

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 as provided in Article 15 of the General Conditions shall bear interest at the maximum legal rate.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to 6, inclusive).
2. Performance bond (pages 1 to 2, inclusive).
3. Payment bond (pages 1 to 2, inclusive).
4. Other bonds.
   a. ___ (pages ___ to ___, inclusive).
5. General Conditions (pages 1 to 63, inclusive).
6. Supplementary Conditions (pages 1 to 3, inclusive).
7. Specifications as listed in the table of contents of the Project Manual.
8. Drawings consisting of 17 sheets with each sheet bearing the following general title: Contract 1: Pittsburg Lift Station & Force Main Extensions
9. Addenda (numbers ___, inclusive).

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

    a. Contractor's Bid (pages 1 to ___, inclusive).

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

    a. Notice to Proceed (pages 1 to 1, inclusive).

    b. Work Change Directives.

    c. Change 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 Paragraph 11.01 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

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

10.02 *Assignment of Contract*

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

10.03 *Successors and Assigns*

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

10.04 *Severability*

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

10.05 *Contractor's Certifications*

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

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

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

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

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

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in four copies. One counterpart each has been delivered to Owner, Contractor, Engineer, and Agency. All portions of the Contract Documents have been signed, initialed, or identified by Owner and Contractor or identified by Engineering on their behalf.

This Agreement will be effective on _____, 2017. This Agreement shall not be effective unless and until Agency's designated representative concurs.

OWNER:	CONTRACTOR:
Wood Creek Water District	
By:	By:
Title: Chairman	Title:
[CORPORATE SEAL]	[CORPORATE SEAL]
Attest:	Attest:
Title:	Title:
Address for giving notices:	Address for giving notices:
1670 Hal Rogers Parkway	
P.O. Box 726	
London, KY 40743	
	Agent for service of process:
(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.)	*(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Agency Concurrence:

As lender or insurer of funds to defray the costs of this Contract, and without liability for any payments thereunder, the Agency hereby concurs in the form, content, and execution of this Agreement.

Agency: USDA Rural Development	By:
Date:	Title: State Engineer

SECTION 00550
NOTICE TO PROCEED

TO: _____ DATE: _____

_____ Project: Contract 1: Pittsburg Lift Station

_____ & Force Main Extensions

_____ _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 2017 on or before_____, 2017 and you are to complete the WORK within 60 consecutive calendar days thereafter. The date of completion of all WORK is therefore_____, 2017.

Wood Creek Water District
Owner

By _____

Title Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby

acknowledged on behalf of _____

this the _____ of _____, 2017.

By: _____

Title: _____

Employer Identification
Number: _____

SECTION 00610
PERFORMANCE BOND

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

CONTRACTOR (Name and Address):

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

OWNER (Name and Address): Wood Creek Water District
1670 Hal Rogers Parkway, P.O. Box 726
London, KY 40743

CONTRACT
Date:
Amount:
Description (Name and Location): Contract 1: Pittsburg Lift Station & Force Main Extensions
Laurel County, Kentucky

BOND
Bond Number:
Date (Not earlier than Contract Date):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL
Company:

Signature: _____ (Seal)
Name and Title:

SURETY

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest: _____
Signature and Title

CONTRACTOR AS PRINCIPAL
Company:

Signature: _____ (Seal)
Name and Title:

SURETY

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title:

EJCDC No. C-610 (2002 Edition)
Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

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

2. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.

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

3.1. Owner has notified Contractor and Surety, at the addresses described in Paragraph 10 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and

3.2. Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 3.1; and

3.3. Owner has agreed to pay the Balance of the Contract Price to:

1. Surety in accordance with the terms of the Contract;

2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.

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

4.1. Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or

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

4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or

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

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

2. Deny liability in whole or in part and notify Owner citing reasons therefor.

5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 4.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

6. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To a limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

6.1. The responsibilities of Contractor for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions or failure to act of Surety under Paragraph 4; and

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

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

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

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

10. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

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

12. Definitions.

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

12.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3. Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone
Surety Agency or Broker
Owner's Respresentative (engineer or other party)

SECTION 00615
PAYMENT BOND

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

CONTRACTOR (Name and Address):

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

OWNER (Name and Address): Wood Creek Water District
1670 Hal Rogers Parkway, P.O. Box 726
London, KY 40743

CONTRACT
Date:
Amount:
Description (Name and Location): Contract 1: Pittsburg Lift Station & Force Main Extensions
Laurel County, Kentucky

BOND
Bond Number:
Date (Not earlier than Contract Date):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL
Company:

Signature: _____ (Seal)
Name and Title:

SURETY

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest: _____
Signature and Title

CONTRACTOR AS PRINCIPAL
Company:

Signature: _____ (Seal)
Name and Title:

SURETY

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title:

EJCDC No. C-615 (2002 Edition)
Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, the American Institute of Architects, the American Subcontractors Association, and the Associated Specialty Contractors.

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

2. With respect to Owner, this obligation shall be null and void if Contractor:

2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2. Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

4. Surety shall have no obligation to Claimants under this Bond until:

4.1. Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2. Claimants who do not have a direct contract with Contractor:

1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and

2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and

3. Not having been paid within the above 30 days, have sent a written notice to Surety and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:

6.1. Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2. Pay or arrange for payment of any undisputed amounts.

7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

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

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

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

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

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

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS

15.1. Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone
Surety Agency or Broker:
Owner's Representative (engineer or other party):

SECTION 00625
CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: Pittsburg Lift Station & Force Main Extensions	Owner: Wood Creek Water District	Owner's Contract No.: 1
Contract:		Date of Contract:
Contractor:		Engineer's Project No.: 2016087

This [tentative] [definitive] Certificate of Substantial Completion applies to:

☐ All Work under the Contract Documents: ☐ The following specified portions:

_____

_____

_____

_____

_____
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 Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A [tentative] [revised tentative] [definitive] list of items to be completed or corrected, is attached hereto. 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 Documents.

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:

☐ Amended Responsibilities ☐ Not Amended

Owner's Amended Responsibilities:

_____

_____

_____

Contractor's Amended Responsibilities:

_____

_____

_____

The following documents are attached to and made part of this Certificate:

_____

_____

_____

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 Documents.

_____ _____
Executed by Engineer Date

_____ _____
Accepted by Contractor Date

_____ _____
Accepted by Owner Date

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

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

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AMERICAN COUNCIL OF ENGINEERING COMPANIES

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National Society of Professional Engineers®

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

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

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

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

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

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

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

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

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

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

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

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

10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed

pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.02 *Terminology*

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

B. *Intent of Certain Terms or Adjectives*:

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

C. *Day*:

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

D. *Defective*:

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

   a. does not conform to the Contract Documents; or

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

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

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

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

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

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

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

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

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

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

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

2.02 *Copies of Documents*

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

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

2.03 *Before Starting Construction*

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

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

2. a preliminary Schedule of Submittals; and

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

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

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

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

2.05 *Initial Acceptance of Schedules*

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

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

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

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

2.06 *Electronic Transmittals*

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

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

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

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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

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

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

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

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

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

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

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*:

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

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

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

B. *Resolving Discrepancies*:

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

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

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

3.04 *Requirements of the Contract Documents*

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

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

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

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

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

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

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

4.03 *Reference Points*

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

4.04 *Progress Schedule*

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

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

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

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

4.05 *Delays in Contractor's Progress*

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

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

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

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

2. abnormal weather conditions;

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

4. acts of war or terrorism.

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

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

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

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

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

5.01 *Availability of Lands*

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

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

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

5.02 *Use of Site and Other Areas*

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

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

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

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

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

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

5.03 *Subsurface and Physical Conditions*

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

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

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

3. Technical Data contained in such reports and drawings.

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

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

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

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

5.04 *Differing Subsurface or Physical Conditions*

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

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

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

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

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

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

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the

necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

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

D. *Possible Price and Times Adjustments*:

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

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

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

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

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

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

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

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

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

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

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground

Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

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

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

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

E. *Possible Price and Times Adjustments*:

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

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

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

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

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

5.06 *Hazardous Environmental Conditions at Site*

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

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

2. Technical Data contained in such reports and drawings.

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

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

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

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

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

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

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner

shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

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

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

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

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

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

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

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

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by

Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

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

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

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

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

7.15 *Emergencies*

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

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements*:

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

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

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

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

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

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

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the

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

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

1. *Shop Drawings*:

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

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

2. *Samples*:

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

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

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

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

D. *Engineer's Review*:

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

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

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

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

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

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

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

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

E. *Resubmittal Procedures*:

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

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

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

7.17 *Contractor's General Warranty and Guarantee*

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

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

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

2. normal wear and tear under normal usage.

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

1. observations by Engineer;

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

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

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

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

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

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

8. any correction of defective Work by Owner.

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

7.18 *Indemnification*

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

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

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

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

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

7.19 *Delegation of Professional Design Services*

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

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

professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

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

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

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

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

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

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

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

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

8.02 *Coordination*

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

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

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

3. the extent of such authority and responsibilities.

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

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner 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 utilities, fuel, and sanitary facilities at the Site.

   h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

   i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:

   1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers,

architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

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

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final

payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require 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 utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all disputes that Contractor believes are unsettled; and

e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance*:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within 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.

SECTION 00800
SUPPLEMENTARY CONDITIONS

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

The terms used in these supplementary conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meaning 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 sued in the General Conditions, with the prefix "SC" added thereto.

SC 1.01.A.3 Add the following at the end of the last sentence of Paragraph 1.01.A.3:

The Application for Payment form to be used on this Project is EJCDC C-620 (2013), or RD 1927-7.

SC 1.01.A.8 Add the following at the end of the last sentence of Paragraph 1.01.A.8:

The Change Order form to be used on this Project is EJCDC C-941 or Form RD 1927-7. Agency approval is required before Change Orders are effective or eligible for payment.

SC 1.01.A.48 Add the following language at the end of the last sentence of Paragraph 1.01.A:

A work Change Directive cannot change Contract Price or Contract Times without a subsequent Change Order.

SC 1.01.A.49 Add the following new Paragraph:

Abnormal Weather Conditions – Conditions of extreme or unusual weather for a given region, elevation, or season as determine by Engineer. Extreme or unusual weather that is typical for a given region, elevation, or season shout not be considered Abnormal Weather Conditions.

SC 1.01.A.50 Add the following new Paragraph after Paragraph 1.01.A.49:

Agency-The project is financed in whole or in part by USDA Rural Utilities Services pursuant to the Consolidated Farm and Rural Development Act (7 USC Section 1921 et seq.) The Rural Utilities Service programs are administered through USDA Rural Development offices; therefore, the Agency for these documents is USDA Rural Development.

SC 2.02.A Amend the first sentence of Paragraph 2.02.A to read as follows:

Owner shall furnish the Contractor five copies of the Contract Documents (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format.

SC 2.06.A Add the following language at the end of Paragraph 2.06.A:

All Shop Drawings shall be submitted and returned in portable document format (PDF).

SC 2.06.B Delete Paragraph 2.06.B and replace it with the term [deleted]:

SC 4.01.A Amend the last sentence of Paragraph 4.01.A by striking out the following words:

In no event will the Contract Times commence run later than the ninetieth day after the day of Bid opening or the thirtieth day of the Effective Date of the Contract, whichever is earlier.

SC 5.03 Delete Paragraphs 5.03.A and 5.03B in their entirety and insert the following:

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

SC 5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

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

B. Not Used.

SC 6.02 Add the following new paragraph immediately after Paragraph 6.02.A:

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

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.B:

C. 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. Federal, if applicable (e.g., Longshoremen's)	Statutory
c. Employer's Liability	$ 500,000

2. Contractor's General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of the Contractor:

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. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.	

f. Excess or Umbrella Liability
   1) General Aggregate $ 5,000,000
   2) Each Occurrence $ 5,000,000

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

   a. Bodily Injury:
      Each Person $ 1,000,000
      Each Accident $ 1,000,000
   b. Property Damage:
      Each Accident $ 1,000,000
   c. Combined Single Limit of $ 1,000,000

4. The Contractual Liability coverage required by paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:

   a. Bodily Injury:
      Each Person $ 2,000,000
      Each Accident $ 2,000,000
   b. Property Damage:
      Each Accident $ 2,000,000
      Annual Aggregate $ 2,000,000

SC 7.04 Amend the third sentence of Paragraph 7.04.A by striking out the following words:

Unless the specifications of description contains or is followed by words reading that no like, equivalent, or "an-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 the paragraph.

SC 7.04.A.1 Delete paragraph 7.04.A.1.a.4 and insert "Deleted" in its place

SC 7.06.A Amend Paragraph 7.06A by adding the following text at the end of the Paragraph:

The Contractor shall not award work valued at more than fifty percent of the Contract Price to Subcontractor(s).

SC 7.06.B Delete paragraph 7.06.B and insert "Deleted" in its place.

SC 7.06.E Amend the second sentence of Paragraph 7.06E by striking out "Owner may also require Contractor to retain specific replacements provided, however, that":

SC 10.03 Add the following language at the end of Paragraph 10.03:

The Engineer will provide Resident Project Representative services for this project. The Duties, Responsibilities, and Limitations of Authority of the Resident Project Representative will be as stated in Exhibit D of the Agreement Between Owner and Engineer, E-500, 2013 Edition, as amended and executed for this specific Project.

SC 11.07.C Add the following new Paragraph after Paragraph 11.07B.

All Contract Change Orders must be concurred by Agency before they are effective or can be eligible for reimbursement.

SC 13.02.C Delete Paragraph 13.02.C and insert "Deleted" in its place.

SC 15.01.B Amend the second sentence of Paragraph 15.01B by striking out the following text: "a bill of sale, invoice, or other."

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 the following new Paragraph after Paragraph 15.01.B.3:

The Application for Payment form to be used on the Project is EJCDC C-620 unless another form is agreed upon by the Engineer, Owner, and Agency. The Agency must approve all Applications for Payment before payment is made.

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 and Agency for consideration. If both the Owner and Agency find the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due and payable twenty (20) days after the Application for Payment if presented to the Owner, and the Owner will make payment to the Contractor.

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 18.09 Add the following new paragraph after Paragraph 18.08:

Tribal Sovereignty: No provision of this Agreement will be construed by any of the signatories as abridging or debilitating any sovereign powers of the {insert name of tribe} Tribe; affecting the trust-beneficiary relationship between the Secretary of the Interior, Tribe, and Indian landowner(s); or interfering with the government-to-government relationship between the United States and the Tribe.

SC 19 Add Article 19 titled "FEDERAL REQUIREMENTS"

SC 19.01 Add the following language as Paragraph 19.01 with the title "Agency not a Party"

A. This Contract is expected to be funded in part with funds provided by Agency. Neither Agency, nor any of its departments, entities, or employees is a party to this Contract.

SC 19.02 Add the following sections after Article 19.01 with the title "Contract Approval":

A. Owner and Contractor will furnish Owner's attorney such evidence as required so that the Owner's attorney can complete and execute the following "Certificate of Owner's Attorney" (Exhibit F) before Owner submits the executed Contract Documents to Agency for approval.

SC 19.03 Add the following language after Article 19.02B with the title "Conflict of Interest":

A. Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer. Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or it about to employ, any of the above, has a financial interest in Contractor. Owner's officers, employees, or agents shall

neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or Subcontractor.

SC 19.04 Add the following language after Article 19.03.A with the title "Gratuities";

A. If Owner finds after a notice and hearing that Contractor, or any of the Contractor's agents or representatives offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of Owner or Agency in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, Owner may, by written notice to Contractor, terminate this Contract. Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this contract.

B. In the event this Contract is terminated as provided in paragraph 19.04.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of Contract by Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, owner may pursue exemplary damages in an amount (as determined by Owner) which shall not be less than three nor more than ten times the costs Contractor incurs in providing any such gratuities to any such officer or employee.

SC 19.05 Add the following language after Article 19.04.B with the title "Audit and Access to Records":

A. Owner, Agency, the Comptroller General of the United States, or any of their duly authorized representatives shall have access to any books, documents, papers, and records of the Contractor which are pertinent to the Agreement, for the purpose of making audits, examinations, excerpts, and transcriptions. Engineer shall maintain all required records for three years after final payment is made and all other pending matters are closed.

SC 19.06 Add the following language after Article 19.05.A with the title "Small, Minority, and Women's Businesses";

A. If Contractor intends to let any subcontracts for a portion of the work, Contractor shall take affirmative steps to assure that small, minority and women's businesses are used when possible as sources of supplies, equipment, construction, and services. Affirmative steps shall consist of: (1) including qualified small minority and women's businesses on solicitation lists, (2) assuring that small, minority and women's businesses are solicited whenever they are potential sources; (3) dividing total requirements when economically feasible into small tasks or quantities to permit maximum participation of small, minority, and women's businesses; (5) using the services and assistance of the Small Business Administration and the Minority Business Development Agency of the US Department of Commerce; (6) requiring each party to a subcontract to take the affirmative steps of this section' and (7) Contractor is encouraged to procure goods and service from labor surplus area firms.

SC 19.07 Add the following language after Article 19.06.A with the title "Anti Kickback";

A. Contractor shall comply with the Copeland Anti-Kickback Act (18 USC 874 and 40 USC 276c) as supplemented by Department of Labor regulations (29 CFR Park3, "Contractors and subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans or Grants of the United States"). The Act provides that Contractor or subcontractor shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled. Owner shall report all suspected or reported violations to Agency.

SC 19.08 Add the following language after Article 19.07.A with the title "Clean Air and Pollution Control Acts";

A. If this Contract exceeds $100,000, compliance with all applicable standards orders or requirements ussued under sections 306 of the Clean Air Act *42 USC 1857(b) and 42 USC 7401et.seq.), section 508 of the Clean Water Act (33 USC 1368) and Federal Water Pollution Control Act (33 USC 1251et. seq.), Executive Order 11738, and Environmental Protection Agency regulations as required. Contractor will report any violations to the Agency and the Regional Office of the EPA.

SC 19.09 Add the following language after Article 19.08 with the title "State Energy Policy":

A. Contractor shall comply with the Energy Policy and Conservation Act (P.L. 94-163). Mandatory standards and policies relating to energy and efficiency, contained in any applicable state Energy Conservation plan shall be utilized

SC 19.10 Add the following language after Article 19.09 with the title "Equal Opportunity Requirements";

A. If this Contract exceeds $10,000, Contractor shall comply with Executive Order 11246, "Equal Employment Opportunity", as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity." And as supplemented by regulations 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

B. Contractor's compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the Standard Federal equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR art 60-4 and its efforts to meet the goals established for the geographical area where the Contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting Contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR part 60-4. Compliance with the goals will be measured against the total work hours performed.

C. Contractor shall provide written notification to the Director of the Office of Federal Contractor Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tire for construction work under the Contract resulting from this solicitation. The notifications shall list the name, address, and telephone number for the subcontractor; employee identification number; estimated starting and completion date of the subcontract; and the geographical area in which the Contract is to be performed.

SC 19.11 Add the following language after Article 19.10.C with "Restrictions of Lobbying";

A. Contractor and each subcontractor shall comply with Restrictions on Lobbying (Public Law 101-121, Section 319) as supplemented by applicable Agency regulations. This Law applies Federal loan that exceeds $150,000 or a Federal grant that exceeds $100,000. If applicable, Contractor must complete a certification form on lobbying activities related to the specific Federal loan or grant that is a funding source for this Contract. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, or an

employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 USC 1352. Each tier shall disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Certifications and disclosures are forwarded from tier to tier up to the Owner. Necessary certification and disclosure forms shall be provided by Owner.

SC 19.12 Add the following language after Article 19.11.A with the title "Environmental Requirements":

When constructing a Project involving trenching and/or other related earth excavation, Contractor shall comply with the following environmental conditions:

A. Wetlands- When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.

B. Floodplains- When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise concert 100-year floodplain areas (Standard Flood Hazard Area) delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, E.G. alluvial soils on NRCS Soul Survey Maps.

C. Historic Preservation- Any excavation by Contractor that uncovers an historical or archaeological artifact or human remains shall immediately report to the Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the State Historic Preservation Officer (SHPO).

D. Endangered Species- Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or other threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the US Fish and Wildlife Service.

KENVIRONS, INC.
FRANKFORT, KENTUCKY

Project No.
2016087
Change Order No.
1

CONTRACT CHANGE ORDER

Contract For:
Contract 1: Pittsburg Lift Station & Force Main Extensions

County
Laurel

Owner:
Wood Creek Water District

To _____
(Contractor)

You are hereby requested to comply with the following changes from the contract plans and specifications:

Description of Changes (Supplemental Plans and Specifications Attached)	DECREASE Contract Price	INCREASE Contract Price
TOTALS	$	$
NET CHANGE IN CONTRACT PRICE	$	$

JUSTIFICATION:

The amount of the Contract will be (Decreased) (Increased) by the sum of: _____

_____ Dollars ($ _____

The Contract Total including this and previous Change Orders will be: _____

_____ Dollars ($ _____

The Contract Period provided for completion will be (Increased) (Decreased) (Unchanged): _____

This document will become a supplement to the contract and all provisions will apply hereto.

Requested _____ _____
(Owner) (Date)

Recommended _____ _____
(Owner's Architect/Engineer) (Date)

Accepted _____ _____
(Contractor) (Date)

Approved _____ _____
(Name and Title) (Date)

FORM APPROVED
OMB NO. 0575-0042

Form RD 1924-18
(Rev. 6-97)

UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL DEVELOPMENT
FARM SERVICE AGENCY

PARTIAL PAYMENT ESTIMATE

CONTRACT NO.

PARTIAL PAYMENT ESTIMATE NO.

PAGE _____

OWNER:	CONTRACTOR:	PERIOD OF ESTIMATE
		FROM _____ TO _____

CONTRACT CHANGE ORDER SUMMARY

No.	Agency Approval Date	Amount Additions	Amount Deductions
TOTALS		$0.00	$0.00
NET CHANGE		$0.00	$0.00

ESTIMATE

1. Original Contract	
2. Change Orders	$0.00
3. Revised Contract (1 + 2)	$0.00
4. Work Completed*	
5. Stored Materials*	
6. Subtotal (4 + 5)	$0.00
7. Retainage*	
8. Previous Payments	
9. Amount Due (6-7-8)	$0.00

** Detailed breakdown attached*

CONTRACT TIME

Original (days) _____
Revised _____
Remaining _____

On Schedule ☐ Yes ☐ No

Starting Date _____
Projected Completion _____

CONTRACTOR'S CERTIFICATION:

The undersigned Contractor certifies that to the best of their knowledge, information and belief the work covered by this payment estimate has been completed in accordance with the contract documents, that all amounts have been paid by the contractor for work for which previous payment estimates was issued and payments received from the owner, and that current payment shown herein is now due.

Contractor _____

By _____

Date _____

APPROVED BY OWNER:

Owner _____

By _____

Date _____

ARCHITECT OR ENGINEER'S CERTIFICATION:

The undersigned certifies that the work has been carefully inspected and to the best of their knowledge and belief, the quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents.

Architect or Engineer _____

By _____

Date _____

ACCEPTED BY AGENCY:

The review and acceptance of this estimate does not attest to the correctness of the quantities shown or that the work has been performed in accordance with the contract documents.

By _____

Title _____

Date _____

TYPICAL UNIT PRICE BREAKDOWN *

ITEM	DESCRIPTION	CONTRACT *(revised)*			THIS PERIOD		TOTAL TO DATE		% COM-PLETE
		QUANTITY	UNIT PRICE	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
				$0.00		$0.00		$0.00	0
	TOTALS			$0.00		$0.00		$0.00	0

TYPICAL LUMP SUM PRICE BREAKDOWN *

ITEM	DESCRIPTION	SCHEDULED VALUE	WORK COMPLETED		% COM-PLETE
			THIS PERIOD	TO DATE	
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
	TOTALS	$0.00	$0.00	$0.00	0

TYPICAL STORED MATERIALS AND RETAINAGE BREAKDOWN *

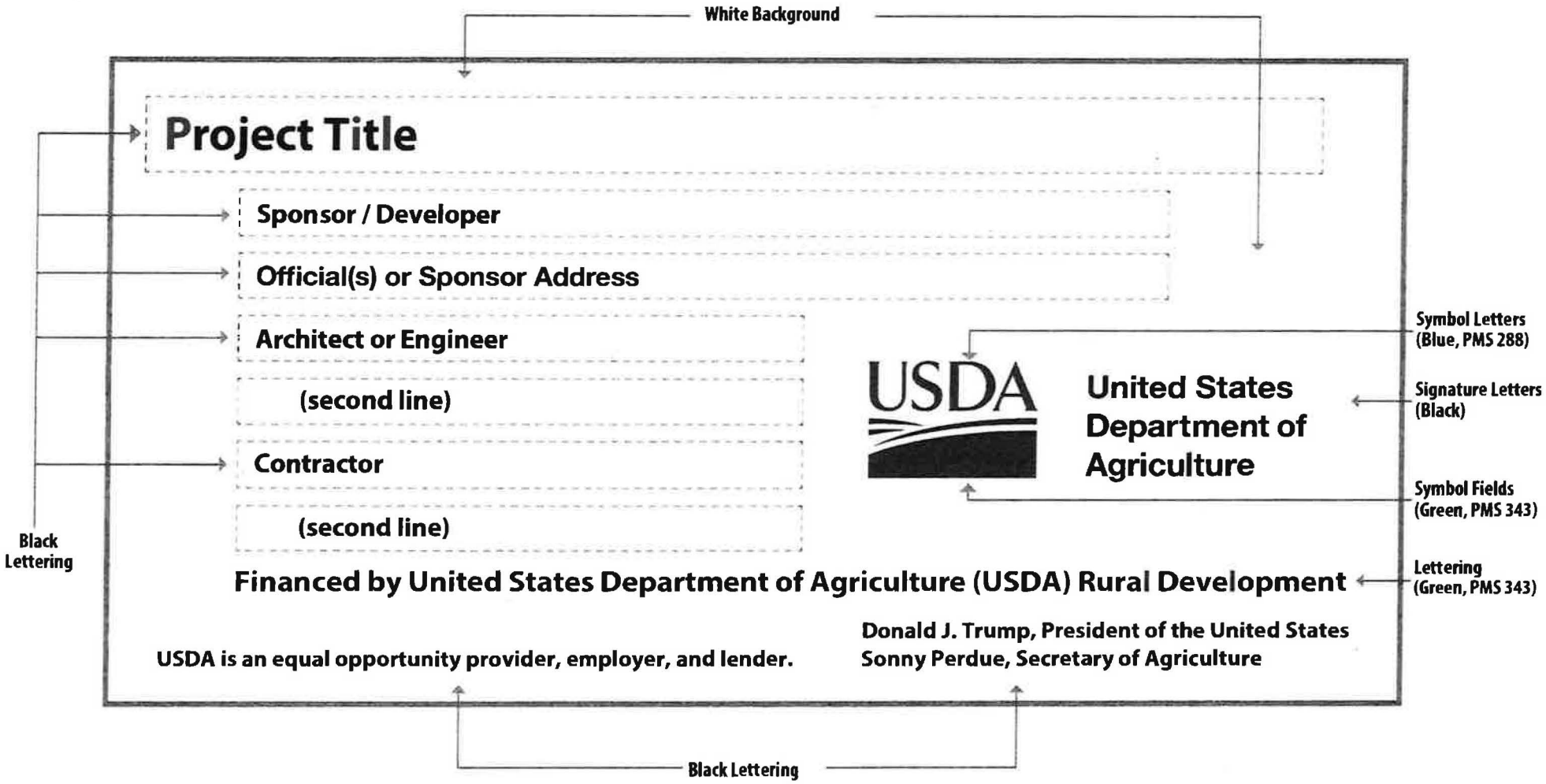
MATERIALS STORED AT END OF THIS PAYMENT PERIOD			
DESCRIPTION	QUANTITY	UNIT VALUE	AMOUNT
			$0.00
			$0.00
			$0.00
			$0.00

RETAINAGE			
	THIS ESTIMATE	PERCENT	RETAINED
WORK COMPLETED:		%	
STORED MATERIALS:			
OTHER (explain)			
TOTAL			$0.00

* As a minimum, detailed breakdowns should contain this information.

TEMPORARY CONSTRUCTION SIGN FOR RURAL DEVELOPMENT PROJECTS

Recommended Fonts: Helvetica, Arial, or Myriad Pro



SIGN DIMENSIONS : 1200 mm x 2400 mm x 19 mm (approx. 4' x 8' x ¾")
PLYWOOD PANEL (APA RATED A-B GRADE–EXTERIOR)

TECHNICAL SPECIFICATIONS

CONTRACT 1: PITTSBURG LIFT STATION & FORCE MAIN EXTENSIONS

WOOD CREEK WATER DISTRICT
LAUREL COUNTY, KENTUCKY

PREPARED BY:

KENVIRONS, INC.
452 VERSAILLES ROAD
FRANKFORT, KY 40601

PROJECT NO. 2016087

OCTOBER 2017

DIVISION 1: GENERAL REQUIREMENTS

SECTION 01000

SUMMARY OF WORK & BID ITEM DESCRIPTIONS

1.0 SCOPE OF WORK PERFORMED UNDER THIS CONTRACT

This contract provides for the construction of Contract 1.

2.0 BID ITEM DESCRIPTIONS

Bid Items shall be as defined below. Work shown, specified and/or required but not specifically set forth below as being a part of a particular Bid Item shall be considered incidental to the appropriate, associated Bid Item and all costs thereof shall be included in the cost of the associated Bid Item. The tabulation below indicates the extent of each Bid Item and the Work associated with that Item.

Each Bid Item includes all necessary materials, labor, tools, equipment, clean-up, public protection and all Work necessary to produce a sound, functioning installation in compliance with the Contract Documents and in a good, workmanlike manner.

Each Bid Item includes the removal and lawful disposal of all excess and waste materials from the Owner's property and the general cleanup and surface restoration of the Work site.

All equipment specified to be removed and removed under this Contract shall remain the property of the Owner and shall be delivered by the Contractor to the Owner, at a location as directed and at no additional cost to the Owner. This requirement may be waived in writing by the Owner, and in such case, shall be removed by the Contractor as waste materials.

All Work within Commonwealth of Kentucky highway right-of-way shall comply with current Kentucky Department of Highways Standard Specifications and shall be provided in compliance with all terms of the governing DOH Encroachment Permit.

Work to be provided under respective Bid Items shall be as follows:

Bid Item Nos. 1, 2 & 3: Furnish and install 3" PVC, SDR-17 and HDPE, DR-17 Force Main, and 2" PVC, SDR-17 Force Main and all necessary appurtenances as shown and specified in the Contract Documents, complete and functional.

Work includes excavation, pipe bedding, poured concrete thrust blocking, backfill, surface restoration, flushing, and pressure testing. Work also includes final closing connections and any and all incidental and/or temporary Work required to properly install and test the new force main pipe in accordance with the Contract Documents.

All trench excavation shall be included in the Bid Item price as unclassified excavation and no additional payment will be due to the Contractor for rock excavation,

dewatering and/or required trench bottom improvement, if any. Bid Item footage shall be paid through casing pipe at the Bid Item Unit Price. Bid Item price includes installation of the carrier pipe in the casing, including all appurtenant position guides and end seals complete, but does not include the cost of providing and installing the casing pipe, which shall be paid under separate Bid Item.

A Unit Price per linear foot of 3" and 2" PVC SDR-17 Force Main installed, complete and functional.

Bid Item Nos. 4, 5 & 6: Furnish and install continuous welded steel casing (cover pipe) of nominal 8-inch outside diameter and 0.250-inch wall thickness for 3" PVC SDR-17, by boring and jacking or open cut to the lines and grades shown and specified in the Contract Documents, or as directed by the Engineer.

Furnish and install continuous welded steel casing (cover pipe) of nominal 6-inch outside diameter and 0.250-inch wall thickness for 2" PVC SDR-17, by boring and jacking to the lines and grades shown and specified in the Contract Documents, or as directed by the Engineer.

Bid Item includes unclassified excavation of jacking pit and interceptor trench, set-up and casing installation, teardown and backfill of pit and trench, and surface restoration by preparation and seeding.

Unless otherwise ordered and authorized in writing by the Engineer, casing length installed shall be as shown on the Project Drawings.

Item does **not** include carrier pipe material and installation which will be paid under separate Bid Item.

A Unit Price per lineal foot of 8" and 6" O.D. Steel Casing pipe installed, complete and functional.

Bid Item Nos. 7 & 8: Remove existing clean-out and install a 4" x 2" ductile iron reducer in existing force main.

Remove existing clean-out and install a 3" x 2" ductile iron reducer in existing force main.

Bid Item includes unclassified excavation, pipe materials, pipe installation, pipe bedding, poured concrete thrust blocking, excavation backfill and surface restoration.

Bid Item also includes flushing and pressure testing, which may be provided in conjunction with Bid Item No. 1.

A Per Each Price for the completed 4" x 2" and 3" x 2" Tie-In, complete and functional.

Bid Item No. 9: Furnish and install 3" gate valve w/ cast iron valve box, 6' of 3" PVC, SDR-17 pipe, and 3" ductile iron, mechanical joint end cap as shown on Sheet D-2 of the Project Drawings.

Bid Item includes unclassified excavation, pipe materials, pipe installation, pipe bedding, poured concrete thrust blocking, excavation backfill and surface restoration.

A Per Each Price for the 3" stub-out, complete and functional.

Bid Item No. 10: Furnish and install an air release valve, and fittings as shown on Sheet D-1 of the Project Drawings.

Bid Item includes unclassified excavation, pipe materials, pipe installation, pipe bedding, poured concrete thrust blocking, excavation backfill and surface restoration.

A Per Each Price for the air release valve, complete and functional.

Bid Item No. 11: Furnish and install the end line clean-out, and fittings as shown on Sheet D-1 of the Project Drawings.

Bid Item includes unclassified excavation, pipe materials, pipe installation, pipe bedding, poured concrete thrust blocking, excavation backfill and surface restoration.

A Per Each Price for the end line clean-out, complete and functional.

Bid Item No. 12: Furnish and install one 700 GPM Lift Station including wet well, valve vault, meter vault, 3,000 Gallon Hydrogen Peroxide Double Wall Storage Tank and appurtenances, modifications to existing control building, two (2) 60 horsepower pumps, controls and appurtenances, access hatches, all piping, valves, pump controls, wiring, mechanical and electrical equipment, and all incidental equipment and Work as shown and/or specified in the Contract Documents, complete and functional.

Bid Item also includes two (2) variable frequency pump motor drives (VFDs) with appurtenant pressure sensing transducers, power connections and signal wiring as shown and specified, installed complete and functional.

Bid Item also includes installation of a new electric service drop pole, service drop, meter base, underground power wiring, main disconnect switch and incoming electrical surge protection as shown and specified, complete and functional.

A Lump Sum Bid Price for the Pittsburg Lift Station and all necessary appurtenances, complete and functional.

Bid Item No. 13: Contractor shall provide a jacking pit and bore through the earth at proper line and grade. The augured hole shall be as small as practical to allow the carrier pipe to pass through.

This bid item does not apply to service tubing.

A Unit Price per linear foot of Free Bore installed, complete and functional.

Bid Item No. 14a: The Crushed Stone Structural Fill Unit Price shall include all Crushed Stone Structural Fill required under any structural elements. This Unit Price does not include any aggregate associated with trenching, pavements, access roads or contractor errors. This item does not apply to aggregate base under bituminous paving, sidewalks or gravel areas. There will be no compensation for over excavation beyond the plan limits. The intent of this item is to establish a unit price for crushed stone fill in the event unforeseen subsurface conditions necessitate additional foundation stabilization beyond the plan limits.

The unit price shall include all costs associated with removing and disposing of unsuitable foundation material on the project site and filling with crushed stone aggregate. Aggregate shall be compacted in 6 inch lifts.

A Unit Price per linear foot of Crushed Stone installed, complete and functional.

Bid Item No. 15: This bid item stipulates an established cost of $17,500 for the purchase of a Telemetry (SCADA/RTU) Panel and shall be included in the Total Base Bid. The Owner shall obtain cost quotations for the equipment and deliver the quotations to the Contractor for the purchase of the Telemetry Panel. The Contractor shall be responsible for installing the panel and all related field wiring as indicated in the plans and specifications. A contract cost adjustment will be made by Change Order to reflect the actual equipment cost. . The following list of equipment will be provided by the telemetry equipment manufacturer. All other equipment required for a complete and operable telemetry system shall be provided by the contractor.

Equipment provided by telemetry manufacturer:

Quantity	Item
1	Complete Telemetry Panel
1	Antenna with mounting U-bolts
1	Coaxial cable with Connectors as needed
1	Submersible Pressure Transmitter
2	Wet Well Level Float Switches

Telemetry manufacturer shall cover freight cost to jobsite. Manufacturer will make a single trip to provide startup services. A two week notice and full payment (less retainage) will be required prior to arranging startup services. Verification of installation shall be confirmed by the Contractor prior to startup.

END OF SECTION

SECTION 01001

SPECIAL CONDITIONS

1.0 DESCRIPTION OF THE WORK AND DESIGNATION OF OWNER

These Specifications and accompanying Drawings describe the work to be done and the materials to be furnished for the construction of the project entitled Contract 1: Pittsburg Lift Station & Force Main Extensions.

All references to the Owner in these Specifications, Contract Documents and plans shall mean the Wood Creek Water District.

2.0 AVAILABLE FUNDS

The attention of all Bidders is directed to the fact that funds will be made available for the award of the contract through Rural Development.

3.0 TIME OF COMPLETION

The time allowed for the completion of each contract is 60 calendar days. The time allowed for completion shall begin at midnight, local time, on the date which the Owner, or his authorized representative, the Engineer, shall instruct the Contractor in writing to start work, but no later than 10 days after Notice to Proceed.

Additional time will be allowed the Contractor to cover approved over-runs or additions to the contract in the same proportion that the said over-run or addition in net monetary value bears to the original amount; the total of said additional time to be computed to the nearest whole calendar day.

4.0 LIQUIDATED DAMAGES

It is understood that time is the essence of this contract and that the Owner will sustain damages, monetary and otherwise, in the event of delay in completion of the work hereby contracted.

Therefore, if the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part of the consideration for the awarding of these contracts, to pay to the Owner the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the work. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and

ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

Liquidated damages are fixed at $800 per calendar day of over-run beyond the date set for completion or authorized extension thereof.

5.0 INSURANCE

See Section 00800, Supplementary Conditions SC 6.03 for the minimum amounts of insurance coverage to be furnished under these contracts.

6.0 PERFORMANCE AND PAYMENT BOND

The Contractor shall furnish separate performance and payment bonds issued by an approved bonding company in an amount at least equal to one hundred percent (100%) of the contract price, as security for the faithful performance of this contract and for the payment of persons performing labor and furnishing materials in connection with this contract. These bonds shall be executed by a company authorized to do business in the State of Kentucky and shall be signed or countersigned by a Kentucky resident agent. Bonds shall remain in effect for one year after date of final acceptance of the work.

7.0 SITE DIMENSIONS

All Contractors furnishing materials and equipment for this contract shall obtain exact dimensions at the site. Scale or figure dimensions on the drawings and details show the correct size under ideal conditions and shall not, under any circumstances, be so construed as to relieve the Contractor from responsibility for taking measurements at the site and furnishing materials or equipment of the correct size.

8.0 DAMAGE TO EQUIPMENT STORED AND/OR IN PLACE PRIOR TO INITIAL OPERATION

Any equipment damaged or which has been subjected to possible damage by reason of inundation, improper storage and/or protection during the construction period of project, shall be handled only as follows:

a) Be replaced with new equipment.

b) With approval of the Engineer, be returned to the manufacturer of the equipment, or his authorized repair agency, for inspection and repair provided, however, that such repair after inspection will place

the equipment in new condition, and restore the manufacturer's guarantee the same as for new equipment.

9.0 SALVAGED MATERIALS AND EQUIPMENT

All materials and/or equipment to be removed from existing structures and not specifically specified to be re-used shall remain the property of the Owner. Such materials and/or equipment shall be stored on sites by the Contractor as directed by the Owner.

The use of second hand and/or salvaged materials will not be permitted, unless specifically provided for in the detailed specifications. Materials and equipment shall be new when turned over to the Owner.

10.0 TEMPORARY FACILITIES

a) Build and maintain temporary offices and storage sheds as necessary for the work. Location of temporary buildings shall be subject to the approval of the Engineer.

b) Provide temporary heat, light and power required by the work. Temporary telephone service shall be provided in the job office paid for by the General Contractor, except that the party placing a long distance call shall pay the toll charge.

c) Each Contractor shall construct and maintain, in a sanitary condition, sanitary facilities for his employees and also employees of his subcontractors. At completion of the contract work, these sanitary facilities shall be properly disposed of as directed by the Engineer.

d) Temporary construction for safety measures, hoists and scaffolds shall be erected in accordance with the General Conditions.

e) Construction yard shall be located on job site. Provide security and safety protection.

f) The obtaining of all utilities for construction, including power and water, shall be the responsibility of the Contractor, and he shall bear the cost of all utilities used for construction. Cost of all connections and facilities for use of utilities shall be borne by the Contractor.

11.0 PROPERTY PROTECTION

Care is to be exercised by the Contractor in all phases of construction to prevent damage and injury to the Owner's or other property.

In connection with work performed on "private property" (property other than that belonging to the Owner), the Contractor shall confine his equipment, the storage of materials, and the operation of his workmen to the limits indicated on the plans, or to lands and right-of-way provided for the project by the Owner, and shall take every precaution to avoid damage to the private property Owner's buildings, grounds and facilities.

Fences, hedges, shrubs, etc. within the construction limits shall be carefully removed, preserved, and replaced when the construction is completed. Where ditches or excavations cross lawns, the sod shall be removed carefully and replaced when the backfilling has been completed. If sod is damaged or not handled properly, it shall be replaced with new sod equal to existing sod at the Contractor's expense. Grassed areas, other than lawns, shall be graded, fertilized and seeded when construction is completed. When construction is completed the private property Owner's facilities and grounds shall be restored to as good or better condition than found as quickly as possible at the Contractor's expense. All disturbed areas shall be re-vegetated (permanently or temporarily) within 14 days.

12.0 CONFLICT WITH OR DAMAGE TO EXISTING UTILITIES AND FACILITIES

Insofar as location data is available to the Engineers, existing underground utilities (such as waterlines, sewer lines, gas lines, telephone conduits, etc.) are accurately located on the drawings. Due, however, to the approximate nature of much of this data, the location of any particular facility cannot be certified to be correct. In general, locations and elevations shown are approximate only.

Before proceeding with the work, the Contractor shall confer with all public or private companies, agencies, or departments that own and operate utilities in the vicinity of the construction work. The purpose of the conference is to verify the location of, and possible interference with, the existing utilities that are shown on the Plans, arrange for necessary suspension of service, and make arrangements to locate and avoid interference with all utilities that are not shown on the Plans.

13.0 CONTROL OF EROSION

The Contractor shall be responsible for control of siltation and erosion from the project work. Control shall include all necessary ditching, check dams, mulching, etc. to prevent deposition of materials in roadside ditches. The Owner shall incur no extra costs from such work.
The contractor shall obtain and pay for all grading, storm water, etc. permits, if any required to complete the work. The contractor shall maintain compliance with all conditions, limitations and stipulations of all permits. The contractor shall not commence work, except mobilization, until he has obtained all required

permits for said work. The contractor shall supply the owner with copies of all permits within 24 hours of receipt. A KPDES Storm Water Discharge Permit will be required for this project. The contractor shall fill out, sign and submit the Notice of Intent (NOI) and the Notice of Termination (NOT). The notice to proceed will not be issued until the permit has been provided. The Kentucky Pollution Discharge Elimination System (KPDES) Form NOI-SWCA is included in these Specifications. The preferred electronic Notice of Intent (eNOI) for Stormwater Discharges Associated with Construction Activity (KPDES Form NOI-SWCA) under the KPDES General Permit is available on the Web.

For the eNOI, visit: https://dep.gateway.ky.gov/eForms/default.aspx?FormID=48.

14.0 MEASUREMENT AND PAYMENT

14.1 MEASUREMENT OF QUANTITIES

All Work completed under the Agreement will be measured by the Engineer according to United States standard measure.

14.1.1: Unless otherwise specified, measurement of concrete quantities will include only that volume within the neat lines as shown on the Plans or as altered by the Engineer to fit field conditions. The prismoidal formula will be used in computing the volumes of structures, or portions of structures, having end sections of unequal areas.

14.1.2: All items which are measured by the linear foot, such as pipe, will be measured along the centerline distance of the installed item with no allowance for connections, fittings or laps at connections.

14.1.3: In computing volumes of excavation, borrow and embankments, the average end-area method will be used. For the purpose of ascertaining quantities, it is agreed that the planimeter shall be considered an instrument of precision adapted to the measurement of areas.

14.2 LUMP SUM

When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.

14.3 PLAN QUANTITIES

When the plan quantities for a specific portion of the Work are designated as the pay quantities in the Contract Documents, they shall be the final quantities for which payment for such specific portion of the Work will be made, unless the dimensions of said portions of the Work shown on the plans are revised by the

Engineer. When revised dimensions result in an increase or decrease in the quantities of such Work, the final quantities for payment will be revised in the amount represented by the authorized changes in dimensions.

14.4 ACTUAL QUANTITIES

When actual quantities for a specific portion of the Work are designated as the pay quantities in the Contract Documents, they shall be the final quantities for which payment for such specific portion of the Work will be made. The actual quantities will be determined by the difference in field measurements and cross sections before and after construction.

14.5 SCOPE OF PAYMENT

The contract unit prices whether based on lump sum, plan quantities or actual quantities for the various bid items of the Contract Documents shall be considered full compensation for all labor, materials, supplies, equipment, tools, and all things of whatever nature required for the complete incorporation of the item into the Work the same as though the items were to read "in Plan" unless the Contract Documents provide otherwise.

14.6 PAYMENTS

Estimates for payment, partial payments and final payments shall be in accordance with and follow procedures set forth in the General Conditions and Supplementary Conditions.

15.0 ACCESS ROADS

The Contractor, Contractor's employees and all trucks delivering equipment, supplies or materials to the project shall use the access roads shown in the Plans for entering and leaving the project sites.

16.0 TESTING LABORATORY SERVICES

16.1 GENERAL

16.1.1 Work Included. From time to time during progress of the Work, the Owner may require that testing be performed to determine that materials provided for the Work meet the specified requirements; such testing includes, but is not necessarily limited to:

1) Material Compaction
2) Cast-In-Place Concrete

16.1.2 Related Work Described Elsewhere. Requirements for testing may be described in various Sections of these Specifications; where no testing requirements are described, but the Owner decides that testing is required, the Owner may require testing to be performed under current pertinent standards for testing.

16.1.3 Selection of Testing Laboratory. The Owner will select a testing laboratory.

16.1.4 Codes and Standards. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

16.1.5 Product Handling. The Contractor shall promptly process and distribute all required copies of test reports for which he is responsible and related instructions to ensure all necessary retesting and/or replacement of materials with the least possible delay in progress of the Work.

16.2 PAYMENT FOR TESTING SERVICES

16.2.1 Initial Services. The Contractor will pay for all initial testing services required by the Owner.

16.2.2 Retesting. When initial tests indicate non-compliance with the Contract Documents, all subsequent retesting made necessary by the non-compliance shall be performed by a testing laboratory selected by the Contractor and approved by the Engineer and the costs thereof will be paid directly by the Contractor.

16.2.3 CONTRACTOR'S Convenience Testing. Inspection or testing performed exclusively for the CONTRACTOR'S convenience shall be the sole responsibility of the Contractor.

16.3 EXECUTION

16.3.1 Cooperation with Testing Laboratory. Representatives of the testing laboratory shall have access to the Work at all times. The Contractor shall provide facilities for such access in order that the laboratory may properly perform its functions.

16.3.2 SCHEDULES FOR TESTING

16.3.2.1 Establishing Schedule. By advance discussion with the testing laboratory selected by the Owner, the Contractor shall allow for the time required for the laboratory to perform its tests and to issue each of its findings. The Contractor shall allow for this time within the construction schedule.

16.3.2.2 Revising Schedule. When changes of construction schedule are necessary during construction, the Contractor shall coordinate all such changes of schedule with the testing laboratory as required.

16.3.2.3 Adherence to Schedule. When the testing laboratory is ready to test according to the determined schedule but is prevented from testing or taking specimens due to incompleteness of the Work, all extra costs for testing attributed to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

16.3.3 Taking Specimens. All specimens and samples for testing, unless otherwise provided in these Contract Documents, will be taken by the testing laboratory; all sampling equipment and personnel will be provided by the testing laboratory; and all deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

17.0 SUBMITTALS AND SUBSTITUTIONS

17.1 GENERAL

17.1.1 Work Included. Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards. To insure that the specified products are furnished and installed in accordance with design intent, procedures have been established for advance submittal of design data and for its review and approval or rejection by the Engineer.

17.1.2 Related Work Described Elsewhere.

17.1.2.1 Contractual requirements for submittals are described in the General Conditions and Supplementary Conditions.

17.1.2.2 Individual submittals required are described in the pertinent sections of these Specifications.

17.2 SUBSTITUTIONS

17.2.1 ENGINEER'S Approval Required. The Agreement is based on the materials, equipment, and methods described in the Contract Documents. The Engineer will consider proposals for substitution of materials, equipment, and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Engineer to evaluate the proposed substitution. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this Work by the Engineer.

17.2.2 "Or Equal". Where the phrase "or equal" occurs in the Contract Documents, do not assume that material, equipment, or methods will be approved as equal by the Engineer unless the item has been specifically approved for this Work. The decision of the Engineer shall be final.

17.2.3 Availability of Specified Items. The Contractor shall verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the Work. In the event the specified item or items will not be so available, the Contractor shall notify the Engineer prior to receipt of Bids.

17.3 IDENTIFICATION OF SUBMITTALS

The Contractor shall completely identify each submittal and resubmittal by showing at least the following information:

1) Name and address of submitter, plus name and telephone number of the individual who may be contacted for further information.

2) Name of project as it appears in these Specifications.

3) Drawing number and Specifications Section number to which the submittal applies.

4) Whether this is an original submittal or resubmittal.

17.4 COORDINATION OF SUBMITTALS

17.4.1 General. Prior to submittal for Engineer's review, the Contractor shall use all means necessary to fully coordinate all material, including the following procedures:

1) Determine and verify all field dimensions and conditions, materials, catalog numbers, and similar data.

2) Coordinate as required with all trades and with all public agencies involved.

3) Secure all necessary approvals from public agencies and others and signify by stamp, or other means, that they have been secured.

4) Clearly indicate all deviations from the Contract Documents.

17.4.2 Grouping of Submittals. Unless otherwise specifically permitted by the Engineer, the Contractor shall make all submittals in groups containing all associated items; the Engineer may reject partial submittals as not complying with the provisions of the Contract Documents. The Contractor shall submit all submittals to Engineer in digital PDF format.

17.5 TIMING OF SUBMITTALS

The Contractor shall make all submittals far enough in advance of schedule dates of installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal, and for placing orders and securing delivery. In scheduling, allow at least five full working days for the Engineer's review following his receipt of the submittal.

18.0 INSTALLATION REQUIREMENTS

Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the respective manufacturers, unless otherwise specified.

19.0 PROOF OF COMPLIANCE

Whenever the Contract Documents require that a product be in accordance with Federal specification, ASTM designation, ANSI specification, or other association standard, the Contractor shall present an affidavit from the manufacturer certifying that the product complies therewith. Where requested or specified, the Contractor shall submit supporting test data to substantiate compliance.

20.0 PROJECT RECORD DOCUMENTS

20.1 As the Work progress, the Contractor shall keep a complete and accurate record of changes or deviations from the Contract Documents and the Shop Drawings, indicating the Work as actually installed. Changes shall be neatly and correctly shown on the respective portion of the affected document, using black line prints of the Drawings affected, or the Specifications, with appropriate

supplementary notes. This record set of Drawings, Shop Drawings, and Specifications shall be kept at the job site for inspection by the Engineer.

20.2 The records above shall be arranged in order, in accordance with the various sections of the Specifications, and properly indexed. Prior to application for final payment, and as a condition to its approval by the Engineer, deliver the record Drawings and Specifications, arranged in proper order, indexed, and endorsed as hereinbefore specified.

20.3 No review or receipt of such records by the Engineer or Owner shall be a waiver of any deviation from the Contract Documents or the Shop Drawings or in any way relieve the Contractor from his responsibility to perform the Work in accordance with the Contract Documents and the Shop Drawings to the extent they are in accordance with the Contract Documents.

21.0 PROJECT MEETINGS

The Contractor's Superintendent for the Work shall attend project meetings as required by either the Owner or Engineer.

22.0 VIDEO TAPE

The line Contractor, before proceeding with any work, shall make or have made a video of all areas where work is to be performed and a copy of this video cassette shall be furnished to the Engineer to review for completeness. This video shall be utilized as backup and reference for claims and cleanup.

23.0 DAILY REPORTS

The project inspector, as designated by the Owner and/or Engineer, will keep a daily record of materials installed. This daily report will be used by the Owner and the Engineer to determine the payments due to the Contractor. The Contractor shall sign the inspector's daily report each day. Should the contractor disagree with the inspector's report, the differences shall be resolved before the end of the next day, with the Contractor signing the daily report.

24.0 FINAL ADJUSTMENT OF QUANTITIES

Upon completion of the project, a final adjusting change order will be written to reconcile the differences between the bid quantities and the actual quantities installed. This final adjusting change order will be determined based on the inspector's daily reports.

SECTION 01002

SPECIAL CONSTRUCTION CONSIDERATIONS

1.0 CONSTRUCTION SEQUENCE

It shall be the sole responsibility of the Contractor to plan and implement construction sequences, to follow the Plans and Specifications and to protect any portions of the Work already completed.

2.0 CLEAN-UP

The work will not be considered as complete, and final payment will not be made, until all areas in connection with the Work have been cleared of all rubbish, equipment, excess materials and temporary structures.

3.0 SECURITY BY CONTRACTOR

In addition to the other provisions of the Contract Documents, the Contractor shall be responsible for providing security as he deems necessary for his work areas, storage areas, office areas, equipment, and any other item or area that he is using. The Owner will not be responsible for any damages due to insufficient site security.

4.0 BID SCHEDULE QUANTITIES

The material quantities shown in the bid schedule are not guaranteed and should not be used indiscriminately when ordering materials. The Contractor shall be responsible for ordering material quantities necessary for installation to the limits as shown on the drawings unless otherwise instructed. Any left-over quantities shall be the property of the Contractor unless other arrangements are made. The Owner shall not be responsible for re-stocking or other charges associated with left-over materials or increased costs associated with increases in price for materials needed to complete the project as shown on the drawings.

5.0 PERMITS

The contractor shall obtain and pay for all grading, storm water, etc. permits, if any, required to complete the work. The contractor shall maintain compliance with all conditions, limitations and stipulations of all permits. The contractor shall not commence work, except mobilization, until he has obtained all required permits for said work. The contractor shall supply the owner with copies of all permits within 24 hours of receipt. A KPDES Storm Water Discharge Permit will be required for this project. The contractor shall fill out, sign and submit the Notice of Intent (NOI) and the Notice of Termination (NOT).

6.0 GENERAL CERTIFICATION – NATIONWIDE #12 REQUIREMENTS

The contractor will be required to comply with the requirements of the General Certification – Nationwide Permit #12 contained in Appendix A to these Specifications.

DIVISION 2: SITE WORK

SECTION 02001

EARTHWORK

1.0 SCOPE

This section covers the required topsoil removal, excavation, the removal and proper utilization or disposal of all excavated materials, necessary borrow, fill requirements, and the shaping and finishing of all excavation work to the required lines and grades.

2.0 TOPSOIL REMOVAL

All topsoil on areas to receive fill shall be stripped and stockpiled at an approved location.

3.0 CLEARING AND GRUBBING

Work shall consist of cutting and removing designated trees, stumps, brush, logs, removal of fences, or other loose and projecting material. Unless otherwise specified, it shall also include the grubbing of stumps, roots and other natural obstructions which, in the opinion of the Engineer, must be removed to prosecute properly the construction work and operate properly the facility upon the completion of construction.

No cleared or grubbed materials shall be used in backfills or embankment fills.

All stumps, roots and other objectionable material shall be grubbed up so that no roots larger than 3 inches in diameter remain less than 18 inches below the ground surface.

All holes and depressions left by grubbing operations shall be filled with suitable material and compacted to grade.

Disposal shall be by burning or other methods satisfactory to the Engineer; however, burning will be permitted only when the Contractor has obtained written permission from the local regulatory agency.

The Contractor shall also remove from the site and satisfactorily dispose of all miscellaneous rubbish including, but not limited to, masonry, scrap metal, rock, pavement, etc., that is under the fill or to be removed as shown on the Drawings, specified herein, or directed by the Engineer.

Existing improvements, adjacent property, utility and other facilities, and trees, plants and brush that are not to be removed shall be protected from injury or damage resulting from the Contractor's operations.

Trees and shrubs, designated to remain or that are beyond the clearing and grubbing limits, which are injured or damaged during construction operations shall be treated at the Contractor's expense by experienced tree surgery personnel.

3.1 EROSION CONTROL

Temporary measures shall be applied throughout the construction permit to control and to minimize siltation to adjacent properties and waterways. Such measures shall include, but not be limited to, the use of berms, baled straw silt barriers, gravel or crushed stone, mulch, slope drains and other methods. These temporary measures shall be applied to erodible material exposed by any activity associated with the construction of this project.

4.0 STRUCTURAL EXCAVATION

Structural excavation shall consist of and include the removal of all materials encountered or involved in the excavation and subgrade preparation for the placing of structures. The final depths and extent of structural excavation will be determined by the nature of the material encountered; however, after excavation to the limits as shown on the drawings, the ENGINEER shall inspect the work and determine if additional excavation is required.

5.0 EXCAVATION CONSTRUCTION METHODS

5.1 OPEN-CUT EXCAVATION - GENERAL

All open cut excavation shall be performed in accordance with this section to the lines, grades, and dimensions shown on the drawings or established by the ENGINEER.

All necessary precautions shall be taken to preserve the material below and beyond the lines of all excavation in the soundest possible condition. Any damage to the work due to the CONTRACTOR'S operations, including shattering of the material beyond the required excavation lines, shall be repaired at the expense of and by the CONTRACTOR. Any and all excess excavation for the convenience of the CONTRACTOR for any purpose or reason, except as may be ordered in writing by the ENGINEER and whether or not due to the fault of the CONTRACTOR, shall be at the expense of the CONTRACTOR. Where required to complete the work, all such excess excavation and over-excavation shall be refilled with materials furnished and placed at the expense of and by the CONTRACTOR. Slopes shattered or loosened by blasting shall be taken down at the expense of and by the CONTRACTOR.

All excavation for embankment and structure foundations shall be performed in the dry. No excavation shall be made in frozen materials without written approval.

The bottom and side slope of rock or shale upon or against which concrete or pervious blanket material is to be placed shall be excavated to the required dimensions as shown on the drawings or established by the ENGINEER. No material will be permitted to extend within the neat lines of the structure. If, at any point in rock or shale upon written orders from the ENGINEER, material is excavated beyond the limits required to receive the structure, the additional excavation shall be filled solidly with concrete. If material is excavated beyond the limits required to receive the structure without written orders from the ENGINEER, the additional excavation shall be brought back to grade with "Class A" concrete at the CONTRACTOR'S expense.

5.2 UTILIZATION OF EXCAVATED MATERIAL

All suitable material removed from the excavations shall be used insofar as practicable, in constructing the permanent works and at such other places as directed. The CONTRACTOR shall not waste materials removed from excavations and suitable for use in the construction of the permanent works, without a written application to do so and a written approval from the ENGINEER.

5.3 DISPOSAL OF SURPLUS AND/OR WASTE MATERIAL

All surplus excavated material and/or all waste materials shall be disposed of outside of the floodplain in an area provided by the CONTRACTOR and approved by the ENGINEER.

The surfaces thereof shall be left in a neat and sightly condition and sloped to provide positive drainage. Compaction of the waste materials shall be required.

5.4 BLASTING FOR EXCAVATION

A. General

Blasting may be done only to the depth, amount, and extent, and in such locations approved by the ENGINEER. Approval of the methods of blasting by the ENGINEER will not relieve the CONTRACTOR of his responsibility in blasting operation, and no payment will be made for any necessary extra excavation below or outside of the limit lines indicated on the drawings, or modifications thereof, due solely to injury caused by over-shooting, improper blasting, or carelessness on the part of the CONTRACTOR. All material thus removed shall be replaced by concrete when a concrete structure is to be placed upon or against such surface, or by compacted fill material when fill is to be placed thereon, at the expense of the CONTRACTOR and in a manner satisfactory to the ENGINEER. Extra fill is to be of the same type as that to be placed directly above it.

B. Blasting Trench and/or Structure Excavation

The use of explosives or blasting material of any kind in trench excavation and/or the structure excavation shall be carried out by using not over one-half (1/2) pound of explosives (equivalent in strength to 40 percent dynamite) per cubic yard of material to be blasted and by shooting only a few holes simultaneously.

C. Use of Explosives

The transportation, handling, storage, and use of dynamite and other explosives shall be directed and supervised by a person of proven experience and ability in blasting operation. All blasting operations shall be in accordance with applicable local, state, and federal laws. Before any explosives are brought on the job, permission to do so shall be obtained from the ENGINEER. All blasts shall be fired electrically with an electric blasting machine. Where detonating cord is used as a detonating agent, the detonation cord shall be fired with an electric blasting cap. Delay electric detonators shall be used for all delayed blasts. Blasting machines used for firing shall be known to be in good condition and of sufficient capacity to fire all charges. Rubber-covered or other adequately insulated copper wires in good condition shall be used for firing lines and shall have solid cores of appropriate gage. Sufficient firing lines shall be provided to permit the blaster to be located at a safe distance from the blast. Single conductor lead lines shall be used. All operations involving the handling or use of explosives shall be discontinued during approach of a thunderstorm or while it is in progress. Blasting operations in the proximity of overhead power lines, communication lines, or other structures shall not be carried on until the operator and/or OWNER of such lines has been notified and precautionary measures deemed necessary have been taken. All holes loaded on a shift shall be fired on the same shift. The use of black powder is prohibited. Before any drilling operations in preparation for blasting are started, the CONTRACTOR shall furnish the ENGINEER a detailed plan of operations showing the method proposed for the prevention of damage. In order to assure adequate protection, such plan may be modified to meet the conditions that may develop.

5.5 SHEETING AND BRACING

Sheeting and bracing as may be required to safely support the sides of excavations while maintaining the required side slopes shall comply with the safety precautions as outlined in current and accepted safety manuals, such as "Associated General Contractors Manual of Accident Prevention in Construction". Where sheeting and bracing are necessary to prevent caving of the walls of excavations and to safeguard the workmen, the excavations shall be dug to such widths that proper allowance is made for the space occupied by the

sheeting and bracing. The CONTRACTOR shall perform the additional excavation required and furnish and put in place the necessary sheeting and bracing and shall remove the same as the excavation is filled, at his own expense.

5.6 REMOVAL OF WATER

The CONTRACTOR shall construct and maintain all necessary channels, flumes, and/or other temporary diversion and protective works; shall furnish all materials required therefore; and shall furnish, install, maintain and operate all well points, casings, pumps and other equipment for dewatering the various parts of the work and for maintaining the foundations, trenches and other parts of the work free from water as required for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed, or leveled, to give a slightly appearance and so as not to interfere in any way with the operation, usefulness or stability of the permanent structures.

5.7 PROTECTION OF FINISHED STRUCTURE EXCAVATIONS

It shall be the CONTRACTOR'S responsibility to maintain finished excavated foundation surfaces for the works in good condition until such time as the structures are placed on or against the surfaces.

5.8 BORROW

Borrow excavation shall consist of and include the required excavation and proper utilization of approved materials obtained from designated areas when sufficient quantities of suitable materials are not available from other required excavation.

The control of excavation in any borrow area and the selection of materials therefrom shall at all times be as directed by the ENGINEER. On completion of excavation, all borrow pits shall be left in a neat and sightly condition. Unless otherwise approved by the ENGINEER, all borrow pits shall be so graded and dressed that water will readily drain therefrom, and away from all embankments, berms and structures. When shown on the drawings, terraces, or diversions shall be constructed to protect the slopes of the borrow areas from erosion and shall be considered a subsidiary of this specification.

6.0 STRUCTURE FOUNDATION FILL

After clearing and stripping operations have been completed, all structure locations shall be proofrolled with a loaded pan or heavy pneumatic tired vehicle to densify upper soils and to locate possible areas which will require undercutting, removal and/or re-compaction. This operation shall be conducted under the surveillance of the ENGINEER.

6.1 FILL MATERIAL APPROVAL

Before initiating filling operations, the CONTRACTOR shall receive approval of fill material by the ENGINEER. Several laboratory Proctor density tests shall be run on representative samples obtained from the proposed borrow material.

6.2 PLACEMENT OF FILLS

Where structures or other appurtenances are constructed on fill, the fill shall be placed in layers not over six (6") inches deep, as measured before compaction and be thoroughly compacted.

6.3 COMPACTION

Compaction may be obtained by use of a sheepsfoot roller or pneumatic-tired roller. Water shall be applied as directed to obtain close adhesion between layers and all parts of the material. Fill shall be compacted to a minimum of 95% of the Standard Proctor maximum dry density (ASTM Specifications D- 698). A minimum of two (2) compaction tests per each two (2') feet of fill on a structure location shall be run by an experienced soils engineering technician.

In order to prevent damage to existing structures, heavy construction equipment shall not be allowed to operate within approximately 8 feet horizontally of the existing structure exterior wall.

7.0 BACKFILLING AROUND STRUCTURES

Only suitable material approved by the ENGINEER shall be used for backfilling around structures.

Backfilling around structures shall have material placed in layers of six (6") inch depth and compacted by pneumatic tools or other small equipment operated by hand. In no case shall the backfilling be allowed to obtain an elevation of one (1') foot above any other area. It shall be uniformly compacted throughout the structure depth. Any deviation shall be cause for the ENGINEER to require the material deposited to be removed and re-compacted at the CONTRACTOR'S expense.

All backfilling shall be done in such a manner that the pipe or structure over or against which it is being placed will not be disturbed or injured. Any pipe or structure injured, damaged or moved from its proper line or grade during backfilling operations shall be removed or repaired to the satisfaction of the ENGINEER and then re-backfilled.

8.0 DAM EMBANKMENT *(NOT APPLICABLE TO THIS PROJECT)*

One foot of material shall be stripped from the top of the existing embankment. This material shall be stockpiled for use as final cover. The surface of the embankment shall then be moistened and/or worked with a harrow, scarifier, or other suitable equipment to provide a satisfactory bonding surface for the additional fill. The surface condition must be approved by the ENGINEER prior to any fill being placed.

No fill material used in raising the embankment shall be dumped in place, but shall be distributed by blading or dozing in a manner that will insure placement so that voids, pockets, and bridging are held to a minimum. The hauling and placement equipment shall be routed over the area such that all areas receive approximately the same compactive effort. The fill shall be compacted such that in-place density checks indicate a soil dry density of at least 90 percent of the maximum value as determined by the standard Proctor density test. The embankment shall be raised in approximately horizontal lifts extending the entire length and width of the embankment. The thickness of the lifts before compaction shall not be more than eight (8) inches.

The stockpiled topsoil shall be uniformly spread over the raised embankment to insure that the final surface is capable of being vegetated.

It is anticipated that sufficient material to reach the designated elevations and grades will be generated from the excavation necessary to construct the principal spillway and the cleaning of the emergency spillway. Should an insufficient supply of material be available from these two sources, the needed additional material will be obtained from the borrow area below the toe of the embankment designated on the Drawings. Borrow operations shall be conducted in accordance with 4.08 BORROW.

9.0 PRELOADING OF STRUCTURES

All tanks shall be preloaded with water prior to making final pipe connections. Elevations of structures shall be monitored until settlement has virtually ceased.

10.0 BACKFILLING TRENCHES

The backfill shall be in accordance with other applicable sections of these specifications.

11.0 FINISH GRADING

Finish grading shall be to the finished elevations and grades shown, and shall be made to blend into conformation with remaining natural ground surfaces. All finish graded surfaces shall be left smooth and free to drain. Areas to be sown in grasses shall be prepared according to Section 02003. Excess materials shall

be spread and compacted as directed. Grading within the construction area and around the outside of building and structure lines shall be performed in a manner which will prevent accumulation of water within the area. Where necessary, or where shown, finish grading shall be extended to insure that water will be directed to drainage ditches, and the site area left smooth and free from depressions holding water.

12.0 MAINTENANCE

All excavated and filled areas for structures, trenches, fills, topsoil areas, embankments and channels shall be maintained by the CONTRACTOR in good condition at all times until final acceptance by the OWNER. The CONTRACTOR shall maintain trench backfill at the original ground surface by periodically adding specified backfill material as necessary or when directed by the ENGINEER. Such maintenance shall be continued until final acceptance of the project.

13.0 PAYMENT

Payment for all excavation and fill work shown on the Drawings and herein specified, that is required to complete the clearing, grubbing, site grading, roads, structural excavation, trench excavation, borrow excavation, backfill, sheeting, shoring, topsoil, crushed stone or gravel, drainage, pumping, embankment fills and any other excavation and fills required to complete the work as shown on the Drawings shall be included in the work to which it is subsidiary in the Bid Schedule and no measurement of the quantities will be made. The contours and elevations of the present ground are believed to be reasonably correct but are not guaranteed. The CONTRACTOR shall satisfy himself by actual examination of the site of work as to the existing elevations and contours and the amount of work required under this Section.

The cost of all initial soils inspections and testing shall be paid by the OWNER. If compaction tests do not meet required values, the cost of additional testing as required by the ENGINEER shall be paid by the CONTRACTOR.

SECTION 02003

SEEDING, MULCHING AND CLEANING UP

1.0 GENERAL

The Work covered by this Specification consists of furnishing all materials, equipment, and labor for preparing the seedbed, fertilizing, seeding and mulching the disturbed areas as directed by the ENGINEER. This Specification also covers cleaning up and repairing damage.

The ENGINEER shall direct all areas to receive seeding and mulching. All areas receiving seeding and mulching shall have lime and fertilizer applied.

2.0 MATERIALS

2.1 LIME

Two tons of agricultural limestone per acre shall be required.

2.2 FERTILIZER

A. Amounts. The following amounts of fertilizer are required per acre:

(1) Nitrogen (N)	60 lbs.
(2) Phosphorous (P205)	120 lbs.
(3) Potash	120 lbs.

B. Analysis. This requirement can be met by applying fertilizer having an analysis of 10-20-20 at the rate of 600 pounds per acre.

2.3 SEED

The following amounts of pure live seed are required per acre:

(1) KY-31 Fescue	60 lbs.
(2) Perennial Ryegrass	25 lbs.
(3) Red Clover	10 lbs.

2.4 MULCH

Mulch shall consist of wood fiber applied at a rate of 1600 pounds per acre, bituminous treated straw applied at a rate of 2000 pounds per acre or other mulch subject to the advance approval of the ENGINEER.

3.0 EXECUTION

3.1 TIME

The seeding shall be completed within two weeks after completion of the work or as soon thereafter as conditions are favorable.

3.2 PREPARATION OF SEEDBED

A. Application of Lime and Fertilizer. Immediately prior to seedbed preparation, the CONTRACTOR shall apply the agricultural lime and fertilizer uniformly over the area to be seeded.

B. Mechanical Tillage. The seedbed shall be prepared by pulverizing and breaking up the soil to a minimum depth of two inches with a disk harrow, drag harrow, spike tooth harrow or similar tool. All rocks, clods, and undesirable material that would interfere with seeding operations shall be removed.

3.3 SEEDING

A. Time. The seeding operations shall be performed immediately after, or as soon as practicable, after the seedbed has been prepared.

B. Equipment. The seed shall be drilled or broadcast uniformly over the seedbed with regular approved type of equipment or method acceptable to the ENGINEER.

C. Tillage. The seeded area shall be passed over with a harrow or cultipacker to help cover more seed and improve seedling establishment. Excessive tillage shall be avoided.

3.4 MULCHING

The approved mulch shall be applied uniformly over the seeded area at the rate required.

4.0 CLEANING UP

4.1 After all construction work is complete, prior to final payment, all exposed areas shall be cleaned and left in a sightly manner.

4.2 All unused material shall be removed from the site. No burning will be allowed on the site.

5.0 HYDROSEEDING AND HYDROMULCHING

The CONTRACTOR may hydroseed and hydromulch if the following requirements are met.

1. The individual seed quantities shall be increased by 20%.

2. The mulch shall be a processed hay or straw applied at a rate of 3/4 ton per acre with 80 lbs. per acre of an organic tackifier.

3. The hydroseeder slurry shall not be allowed to drop below a pH of 5.0.

6.0 MAINTENANCE AND WARRANTIES

6.1 MAINTENANCE

The CONTRACTOR shall be responsible for the maintenance of all work under this Section until final acceptance. Adequate protection of exposed slopes shall be provided at all times to prevent excessive erosion. No work will be accepted unless there is evidence of healthy growth and sufficient cover to prevent erosion.

6.2 WARRANTIES

Work executed under this Section shall be guaranteed for one year with the guarantee beginning on the date of final acceptance of all work under this Contract. Any seeded areas of the site which are found to not have an adequate growth of cover during the guarantee period, shall be re-seeded as soon as weather conditions permit, at no cost to the OWNER.

7.0 PAYMENT

Payment for all re-vegetation work and cleanup shall be included in the work to which it is subsidiary in the Bid Schedule and no measurement of the quantities will be made.

DIVISION 11: EQUIPMENT

SECTION 11310

LIFT STATION – SOLIDS HANDLING

1.0 GENERAL

The Contractor shall furnish all labor, materials, equipment and services for manufacturing, assembling, delivering, installing, testing and placing in service the sanitary lift station including pumps, motors, controls, basin and appurtenances.

1.1 DEFINITIONS

When the term "pumping unit" is used, it shall be deemed to mean a pump or pumps, complete with, but not limited to, drive motor, accessories, appurtenances and all associated equipment.

1.2 CONTRACT DRAWINGS

The contract drawings are intended to show a general arrangement of pumping equipment, controls, connected piping and valves. The pump manufacturer shall furnish each pumping unit complete with motor and all components necessary for the intended function of the unit and shall be held entirely responsible for the compatibility of all components furnished.

2.0 MATERIALS

2.1 SUBMERSIBLE NON-CLOG PUMP STATIONS

The non-clog pumps and integrated, close-coupled motor shall be a water tight, fully submersible unit, capable of handling raw unscreened sewage, storm water, and other similar solids-laden fluids without clogging. The pump with its appurtenances and cable shall be capable of continuous submergence in the pumped liquid to a depth of 65 feet.

Major pump components shall be of gray cast iron, ASTM A-48, Class 40, with smooth surfaces devoid of porosity or other irregularities. All exposed nuts and bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumped media (other than the stainless steel components) shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a high solids two part epoxy paint finish on the exterior of the pump.

2.1.1 Motors. The motor housing shall be gray cast iron, ASTM A48 Class 40. The motor shall be of the squirrel-cage induction shell type (NEMA design B),

housed in an air filled, water tight housing, and shall be capable of continuous submerged operation underwater to a depth of 65 feet. The explosion proof variant shall be FM approved for use in NEC Class I, Division I, Groups C & D hazardous locations, and shall carry a T3C surface temperature class rating. The stator windings and stator leads shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be heat-shrink fitted into the stator housing. The use of bolts, pins or other fastening devices requiring penetration of the stator housing shall not be required. The rotor bars and short circuit rings shall be made of cast aluminum. The motor shall be designed for continuous duty operation, handling pumped media with a temperature of up to 40°C (104°F), and capable of handling up to 12 evenly spaced starts per hour. The service factor (as defined by NEMA) shall be a minimum of 1.10. The motor shall be capable of handling an input voltage variation of +/- 10% from nominal. Each pump shaft shall rotate on permanently lubricated, greased bearings. The upper bearing shall be a deep groove ball bearing. The lower bearings shall be a heavy-duty double row angular contact ball bearing. L-10 bearing life shall be a minimum of 50,000 hours at flows ranging from ½ of BEP flow to 1½ times BEP flow (BEP is best efficiency point).

Each phase of the motor shall contain a bi-metallic temperature monitor switch in the upper portion of the stator windings. These thermal switches shall have normally closed contacts and shall be connected in series. The thermal switches shall be set to open at 140°C +/- 5°C. They shall be connected to the control panel, and used in conjunction with, and supplemental to, external motor overload protection so that over temperature in any phase signals the control panel to shut down the motor. Pump motors and motor accessories shall be manufactured and rated for variable frequency drive (VFD) operation.

2.1.2 Seals. Each pump shall be equipped with a tandem mechanical shaft seal system consisting of two totally independent mechanical seals. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary industrial duty **silicon-carbide** seal ring and one rotating industrial duty **silicon-carbide** seal ring. The upper, secondary seal unit, located between the lubricant chamber and motor housing, shall contain one stationary **carbon** seal ring and one rotating seal ring made from **high chrome steel**. Each seal interface shall be held in contact by its own spring system. The seals shall not require routine maintenance, or adjustment, and shall not be dependent on the direction of rotation for proper sealing. Each pump shall be provided with a lubricant chamber for the shaft sealing system which shall provide superior heat transfer and maximum seal cooling. The lubricant chamber shall be designed to prevent overfilling, and to provide lubricant expansion capacity. The drain and inspection plug shall have a positive anti-leak seal, and shall be easily accessible from the outside of the pump. The seal system shall not rely upon the pumped media for lubrication and shall not be damaged when the pump is run dry. The motors

shall be protected by two mechanical seals mounted in tandem with a seal chamber between the seals. Seal chamber shall be oil filled to lubricate seal face and to transmit heat from shaft to outer shell. The upper seal face shall be tungsten carbide and the lower seal face shall be ceramic. Seals shall be nonproprietary items.

An electrical probe shall be provided in a moisture sensing chamber for detecting the presence of water. A solid-state device mounted in the pump control panel or in a separate enclosure shall send a low voltage, low amperage signal to the probe. If, due to a mechanical seal failure, water enters the sensing chamber, the probe shall signal a solid state relay in the control panel. The relay shall then energize a warning device in the control panel. Systems utilizing float switches, dual probes, or any other monitoring devices located solely in the stator housing are not considered to be early warning systems, and shall not be considered equal. The moisture sensing chamber shall have a drain / inspection plug with a positive anti-leak seal which is easily accessible from the outside of the pump.

2.1.3 Impeller Non Clog. The impeller shall be of ductile iron and epoxy coated and shall be of the enclosed, non-clogging dynamically balanced two vane vortex design capable of passing spherical solids with a diameter of 3 inches. The impeller shall have a slip fit into the motor shaft and drive key, and shall be fastened to the shaft by a stainless steel bolt, which is mechanically prevented from loosening by a positively engaging ratcheting washer assembly. The backside of the impeller shall incorporate an active cutter system designed to protect the motor shaft and mechanical seal from stringy or fibrous solids in the process liquid. Solids that attempt to enter the area around the mechanical seal are chopped by the cutting system, and ejected by back vanes on the impeller. Designs that do not incorporate an active cutter system to protect the mechanical shaft seal shall not be considered acceptable.

2.1.4 Pump Case. The pump volute shall be single piece gray cast iron, ASTM A48, Class 40, non-concentric design with centerline discharge. Passages shall be smooth, and large enough to pass any solids that may exit the impeller. The motor shall be attached to the volute by stainless steel bolts. The motor unit, with impeller attached, shall be removable from the volute without requiring removal of the impeller, and without disturbing the watertight integrity of the motor unit.

2.1.5 Power Cables. The cable entry design shall not require specific torque requirements to insure a watertight seal. The cable entry shall consist of a cylindrical elastomer grommet, flanked by stainless steel washers. A cable cap incorporating a strain relief shall mount to the cable entry boss compressing the grommet ID to the cable while the grommet OD seals against the bore of the cable entry. The entry as part of the motor shall be FM approved for use in NEC Class I, Division I, Groups C & D hazardous locations. Wires to from the terminal

board pass through a sealing gland and connect to the motor winding. The sealing gland isolates the connection chamber form the motor chamber.

2.1.6 Quick Removal System and Guide Rails. The discharge base elbow shall be permanently installed in the wet well and connected to the discharge piping. In order to prevent binding or separation of the pump from the guide rail system, the pump(s) shall connect to the guide rail base automatically and firmly, guided by one 2-inch, Schedule 40 type 316 stainless steel guide rail extending from the top of the station to the discharge base elbow. The sliding guide bracket shall be a separate part of the pumping unit, capable of being attached to either standard ANSI or standard DIN pump flanges, so that the bracket is interchangeable with other pumps, and not limited to a specific pump. Non standard flange dimensions or proprietary flange designs shall not be considered acceptable. A field replaceable Nitrile rubber profile gasket or o-ring shall accomplish positive sealing of the pump flange/guide rail bracket to the discharge elbow. Metal to metal contact between the pump and discharge base elbow as a means of sealing shall not be considered acceptable.

2.1.7 Elbow. Discharge elbow for non-clog pumps shall be 3" x 3" ANSI flanged and be an integral part of the guide rail base assembly. Discharge elbows for the grinder pumps shall be 2" x 2" and 2" x 3" flanged.

2.1.8 Lifting Chain. An adequate length size of stainless steel lifting chain shall be supplied for removing the pump. The chain shall be of sufficient length and shall include an adequate number of lifting rings for easy removal. Length shall be 3' greater than the overall wet-well depth.

2.1.9 Spares. Provide one (1) set of spare seals and bearings per model of pump. One transducer and one complete logic controller shall be provided.

2.1.10 Discharging Piping. Polyethylene pipe, DR-11, may be used between the pump connection and the valve vault. Otherwise, all piping shall be Ductile Iron. All piping shall be installed plum and without strains or binds. Piping shall be properly supported.

2.1.11 Check Valves – Pump Discharge. All check valves for pump discharge service shall be flanged AWWA type with outside weights and levers. These shall be APCO or approved equal.

2.1.12 Pipe Fittings. All fittings shall be fused PE fittings or PE to restrained mechanical joint fittings.

Each station is required to have three (3) 1/4-inch taps, with nipples and stop cocks, as shown in the Drawings, for mounting gages (ref. 2.1.21).

2.1.13 Valve Vault Drain. If shown on the plans, a 3" PE DR-17 drain shall be installed from the valve vault floor to the wet well. This drain line shall be properly laid to grade and bedded with stone. A 4" low head flap valve shall be installed as shown on the plans. Valve vault floor shall slope toward drain. In cases where a positive drain is not possible, then a gravel drain as shown on the plans shall be used. A stainless steel hoist socket and cap shall be installed in the valve vault top slab and located per the drawings.

2.1.14 Access Hatches – Wet Well, Valve Vault & Meter Vault. There shall be furnished and installed two (2) aluminum access hatches at each pump station. Hatches shall be sized to allow removal of all pumping equipment. The hatches shall be of non-skid design and designed to handle a weight of 300 pounds per square foot. A recessed, vandal proof locking device shall be provided. A positive hold open bar shall be provided to secure the hatch in the open position. Stainless steel bolts for mounting each rail support plate shall be furnished so that each set of guide rails can mount directly to the access hatch. Size and manufacturer of hatches for wet well and vaults shall be as shown on plans or approved equal.

2.1.15 Pump Basins – Wet Well, Valve Vault & Meter Vault. The pump basin, valve vault and meter vault shall be of concrete construction and coated with Mainstay composite liner or approved equal.

2.1.16 Controls. A NEMA 4X Stainless Steel full dead front panel shall be furnished and installed appropriate for the electrical characteristics of the pump station. Pump control panels shall be a minimum size of 36" high x 30" wide x 10" deep and include all equipment and options listed.

Each control panel shall be UL listed as a complete assembly. The UL label will be a UL 508 industrial control equipment label. A thermal magnetic circuit breaker is provided for each pump. Circuit breakers will be Square D QOU models. Each control panel shall be provide with Circuit breakers mounted on the inner swing out door, IEC rated full voltage non-reversing motor starters, Overload relays that are ambient compensated bimetallic adjustable trip type, 150VA transformer for 120 VAC control power, Primary UL class CC and secondary UL Midget fusing, Hand-off-auto selector switch for each pump, Green LED pump run lights, Red LED Seal fail alarm lights, Solid State Seal Minder relay, GFCI Master Unit for relay protection, 40 Watt flashing red Lexan alarm beacon, Alarm Horn with silence, and 12 VDC battery for backup of alarm beacon, horn, and pump controller. Alarms will continue to be annunciated upon a power outage. Battery shall be rated for 15 Amp/hours, and include 120 VAC battery charger to maintain a full charge on battery provided. Charger output shall be rated for 1.8 Amps @ 12 VDC. Battery shall be a Yuasa-Exide rechargeable lead-acid battery and charger shall be a Johnson Controls Dynasty model.

In addition to the above equipment, a microprocessor based pump controller must be supplied to control each duplex pumping station. The start and stop settings of each pump must be freely adjustable from the menu, as the set-point relative to the high and low level alarms. A two float back up system shall be provided for operation without a transducer.

The controller shall accept a connection from a pressure level sensor, using either standard 0/4-20mA inputs or float switch inputs. This operation will not require any external power supply, because the controller itself will supply the voltage of 24Vdc for the sensor. The controller must be available for integration into a control panel with NEMA protection. The terminals must be of plug-in type with screw connections, in order to easily terminate the final wiring.

All the information and parameters must be shown or modified directly via the front-panel graphical display keypad. The alarms and the pump status are shown on the front-panel as a dynamic real time display. The controller shall be able to start alternating the external devices connected to the controller; the user is allowed to decide the type of alternation required. The alternation types must include runtime alternation (switches after a programmable number of running hours of the lead pump), asymmetrical alternation (switches after a programmable number of stops of the lead pump) and normal alternation (switches upon successive lead pump stops). This allows for homogeneous starting number and the working hours of each pump. The maximum measurable level must to be shown directly in feet. The level must be measured with a 14 ½ bit resolution (equals to about 20.000 point); The microprocessor technology and high level resolution described previously must be able to calculate the inflow and the outflow of the pump pit along with the effective flow of each pump. The controller must be able to program the set-point about the low flow alarm for each pump. The controller must be able to indicate a low supply voltage, power failure, and microprocessor check sum error.

The controller must have analog inputs, 14 programmable digital inputs, and 6 digital outputs (potential free contact) described as follows:

DIGITAL INPUTS:

- Start Float/Run Confirmation - to confirm the real start of the pumps connected to each output; if the inputs are not utilized to confirm the start, the input must be used to indicate generic alarms and the forced disable of the pumps.
- High Level Float - to activate the high level alarms received from the high level float in order to start eventual emergency sequences
- Overflow Sensor - to indicate the exact overflow instant, in order to activate the overflow alarm input in order to increase the overflow number and duration and to start

the eventual overflow flow calculation (and the total volume overflowed).

- Motor protector (P1 and P2) – to indicate an overload condition
- Manual start (P1 and P2) – to indicate that the H-O-A switch has been positioned to the hand mode; the switch will send an input per pump and from the mixer.
- Run Indicator (P1 and P2) – to indicate a running condition on each pump.
- Energy or rain meter (1 and 2) – an input originating from a pulsed channel device to relay precipitation or energy information.
- Low Level Float – to activate the low level alarms from the float in order to initiate the associated alarm sequence.
- Man on site – to indicate that panel has been switched to man on site status

DIGITAL OUTPUTS:

- Pump Control (P1 and P2) - with internal relay to start and stop the pumps of the electro-mechanical devices controlled by the equipment.
- Common Alarm Output - with internal relay to be used for indicating alarms to the device or in the plant based on settings
- Mixer Control – to be used for start/stop of mixers depending on settings.
- Motor Protector Reset – to be used for resetting of electronic motor protector.
- Alarm indication – programmable output to be used to reset motor protector/modem supply.

ANALOG INPUTS:

- Sensor – input from the pressure transducer type sensor. The range is programmable from 0-20ma or 4-20ma to indicate pit level. The readout must be selectable either metric or US units.
- Motor current – input from the motor to monitor current. The range is programmable from 0-20ma or 4-20ma. The readout will be in amperes.
- Pressure – input from a 0-20ma or 4-20ma sensor to indicate line pressure. The readout must be selectable either metric or US units.
- Temperature – input from a PT100 or PTC type RTD sensor. The inputs are from each pump. The readout must be selectable either metric or US units.

The controller must also include seal sensor inputs for sensing moisture in the pump. The input must be capable of receiving an input from a di-electrode probe measuring resistivity in the oil chamber of the pump. The input can be programmed to just indicate an alarm or to shut down the pump in case of failure.

The controller must be able to log in certain values to establish trending. It must be able to interface to a programming tool such as Aquaprog software or Aquaweb to display and print the trend curves. The interface will be via the service port. An optional modem can be used for dial-up or mobile GSM telephone line. In that case dynamic graphical software can be utilized to view in real time the plant status (measured level, pumps running or in failure, calculated flows, alarms, etc.). In both cases, the communication standard for data transmission is the COMLI/Modbus protocol.

The standard supply voltage must be 24VDC or 12 VDC by mean external battery. The temperature operative range must be 32° F up to +150° F.

2.1.17 Mounting Plate. There shall be furnished and installed on the panel prior to shipment a 1/2" thick aluminum mounting plate. This plate shall be drilled and tapped to accept 1/4" stainless steel mounting bolts for securing plate to panel and panel to pedestal. A sufficient number of gas tight cord grips for all cables shall be factory installed inside the control panel. Mounting plate shall equal to U.S. Foundry MP2AL.

2.1.18 Panel Mounting Pedestal. A fabricated aluminum panel mounting pedestal shall be supplied for installation over a 4" diameter hole in the wet well top slab. Pedestal bottom flange shall be fabricated to accept four (4) 1/2" diameter stainless steel concrete anchor bolts and provide for a sturdy panel installation. Top flange on pedestal shall be flanged and drilled in eight (8) places for 1/4" bolts to allow for panel/mounting plate installation. One side of the pedestal shall have a removable gasketed door to allow for cable installation and removal. One side of the pedestal shall be provided with an aluminum vent. All fasteners shall be stainless steel. Pedestal shall be equal to U.S. Foundry Model F-66W24AL or Hoffman Model A66CCOL.

2.1.19 Level Controls. Level sensors shall be a MJK 2100 pressure transmitter or approved equal. Two back up floats shall be provided, as well as a 316 stainless steel mounting bracket.

2.1.20 Identification Nameplate – Accessories. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, and principal rating data. A second identical nameplate shall be provided for all submersible pumps and affixed to the control panel.

2.1.21 Gages. Each station is required to have three (3) taps, with fittings (ref. 2.1.12), in the valve vault. The Contractor is to furnish three (3) gages per station. All gages will have 4 1/2-inch dials, in a liquid filled AISI 36 stainless steel case, and shall be bourdon tube types. Each unit shall be factory equipped with a gage saver, also constructed of stainless steel, with a silicone fill and Buna-N bulb. The pressure ranges for the gages shall be 0-100 psi. Also, one complete gage tool kit shall be furnished. Gages and appurtenances shall be Ashcroft or equivalent.

2.1.22 Pump Operating Conditions.

	Power Rating			Performance Range			
Location	Volts	Phase	Hertz	GPM @ TDH	HP	RPM	Efficiency (Approx.)
Pittsburg	460	3	60	700 @ 173	60	1750	67%

2.1.22.1 Pump Warranty. The manufacturer shall warrant the pumps to be free from defects in workmanship and materials. This shall be a five (5) year non-prorated warranty for the non-clog pumps. The warranty shall begin after shipment to end customer.

The Contractor guarantees and warrants that during the first year of operation, (date pump station is tested, placed in service and a written acceptance letter issued by the Owner) the pump stations will operate satisfactorily and continuously according to the pump requirements specified herein, and that after due notice has been given by the Owner, the pump manufacturer will proceed, within a reasonable time to adjust, regulate, repair and renew at his expense such part or parts, equipment, auxiliaries appurtenances or perform such work as is necessary to maintain the guaranteed capacities, efficiencies and performances.

2.1.22.2 Manufacturers. Myers or Engineer approved equal.

2.2 ELECTROMAGNETIC FLOW METER

The meter shall be equal in all respects to the Badger Model M-2000.

2.2.1. OPERATING CONDITIONS

A. System Components
   1. Metering Tube (Detector)
      a. Consists of stainless steel tube lined with a non-conductive material. Energized detector coils around tube create a magnetic field across the diameter of the pipe. As a conductive fluid flows through the magnetic field, a voltage is

induced across two electrodes; this voltage is proportional to the average flow velocity of the fluid.

2. Signal Amplifier
   a. Consists of unit which receives, amplifies, and processes the detector's analog signal. Signal is converted to both analog and digital signals that are used to display rate of flow and totalization. Processor controls zero-flow stability, analog and frequency outputs, serial communications and a variety of other parameters. Integrated LCD display indicates rate of flow, forward and reverse totalizers and diagnostic messages. Display guides user through programmable routines.

B. Operational Requirements
   1. Electromagnetic Flow Meter
      a. The flow meter system shall operate with a pulsed DC excitation frequency, and shall produce a signal output that is directly proportional and linear with the volumetric flow rate of the liquid flowing through the metering tube. The metering system shall include a metering sensor tube (detector), a signal amplifier, and the necessary connecting wiring. The metering system shall have the ability to incorporate a meter mounted or remote mounted amplifier. A manufacturer-furnished calibration certificate traceable to NIST is required.
      b. Engineering Units:
         1) The signal amplifier shall be program selectable to display the following units of measure: U.S. gallons, imperial gallons, million gallons (U.S.), cubic feet, cubic meters, liters, hector-liters, oil barrels, pounds, ounces or acre feet.
      c. Operating Principle: Electromagnetic Induction
      d. Metering Tube (Detector)
         1) The metering tube (detector) shall be constructed of 316 stainless steel, and rated for a maximum allowable non-shock pressure and temperature for steel pipe flanges, according to ANSI B16.5.
         2) The metering tube (detector) shall be available in line size from ¼" [6 mm] to 54" [1400 mm].

3) The metering tube (detector) end connections shall be carbon steel or 316 stainless steel flanged, according to ANSI B16, Class 150 and AWWA Class B standards.
4) The insulating liner material of the metering tube (detector) shall be made of a hard rubber elastomer and NSF-listed for meter sizes 4" and above, in conformance with manufacturer's recommendation for the intended service or an NSF-listed meter option with PTFE liner.
5) The metering tube (detector) shall include two self-cleaning measuring electrodes. The electrode material shall be corrosion resistant and available in Alloy C or 316 stainless steel.
6) The metering tube (detector) shall include a third "empty pipe detection" electrode located in the upper portion of the inside diameter of the flow tube in order to detect an empty pipe condition when the flow tube is running partially empty. Empty pipe detection that is not activated until the pipe is 50% empty is not acceptable.
7) The metering tube (detector) housing shall be constructed of carbon steel, welded at all joints, and rated to meet NEMA 6P (for the Master meter vault installation) or 4X (for the pump station installation) ratings.
8) The amplifier shall be factory-mounted on the flow tube for the pump stations, and remote mounted at the Master Meter station.
9) When installed in non-metallic or internally lined piping, the metering tube (detector) shall be provided with a pair of corrosion resistant grounding rings. The grounding ring material shall be 316 stainless steel.
10) Fluid Temperature Range
    i. For remote amplifier applications, the fluid temperature range shall be 32°F to 178°F [0°C to 80°C] at a maximum ambient temperature of 122°F [50°C] for the hard rubber liner material.
    ii. For meter-mounted amplifier applications, the fluid temperature range shall be 32°F to 178°F [0°C to 80°C] at a maximum ambient temperature of 122°F [50°C] for the hard rubber liner material.

e. Signal Amplifier

1) The signal amplifier shall be microprocessor based, and shall energize the detector coils with a digitally controlled pulsed DC. The excitation frequency shall be program selectable for the following: 1Hz, 3.75Hz, 7.5Hz, or 15Hz. (factory optimized to pipe size and application)
2) The signal amplifier electrical power requirement shall be 85-265VAC, 45-65Hz. The power consumption shall not exceed 15W.
3) The signal amplifier shall have an ambient temperature rating of -4°F to 140°F [-20°C to 60°C].
4) The signal amplifier shall include non-volatile memory capable of storing all programmable data and accumulated totalizer values in the event of a power interruption.
5) Automatic zero stability, low flow cut-off, empty pipe detection and bi-directional flow measurement shall be inherent capabilities of the signal amplifier.
6) All signal amplifier outputs shall be galvanically isolated to 250 volts.
7) The signal amplifier shall be constructed of cast aluminum (powder-coated paint) and shall meet NEMA 4X/6P (IP66/IP67) ratings.
8) Outputs:

   The signal amplifier shall provide a total of four digital outputs, one analog output and one digital input.

   i. Up to four open collector digital outputs, program selectable from the following: Forward pulse, reverse pulse, AMR pulse, flow set point, empty pipe alarm, flow direction, reset output, error alarm and 24V supply.
   ii. Up to two active digital (24 Volt) outputs, program selectable from the following: Forward pulse, reverse pulse, AMR pulse, flow set point, empty pipe alarm, flow direction, preset output, error alarm and 24V supply.
   iii. Up to two AC solid-state relay outputs, program selectable from the following: Frequency output, flow set point, empty pipe alarm, flow direction, preset amount and error alarm.

iv. One digital input, program selectable from the following: Remote reset, batch reset and positive return to zero.
v. Advanced protocol support using Modbus/RTU.
vi. One analog output programmable and scalable from the following: 0-10mA, 0-20mA, 2-10mA or 4-20mA. Voltage sourced and isolated. Max. loop resistance = 800 ohms.

f. Control and Programming
1) The signal amplifier shall be programmed via three function buttons. The programming functions shall be available in a user-friendly, menu driven software through the four-line LCD interface. The signal amplifier shall accommodate the following languages: English, German, Czech, French or Spanish.
2) Programmable parameters of the amplifier include, but are not limited to: calibration factors, totalizer resets, unit of measure, analog and pulse output scaling, flow-alarm functions, language selection, low-flow cutoff, noise dampening factor and excitation frequency selection.
3) The signal amplifier shall have a programming option allowing entry of a selected numeric password value for tamper protection.

g. System Performance
1) The metering system shall operate over a flow range of 0.10 to 39.4 ft/s [0.03 to 12.0 m/s].
2) The metering system shall perform to an accuracy ± 0.25 percent of rate for velocities greater than 1.64 ft/s [0.50 m/s], ± 0.004 ft/s [± 1 mm/s] for velocities less than 1.64 ft/s [0.50 m/s].
3) The metering system shall be capable of measuring the volumetric flow rate of liquids having an electrical conductivity as low as 5.0 micromhos per centimeter.
4) The system measuring repeatability shall be <0.10% of full scale.

h. Indication
1) The signal amplifier shall include a four-line, 20-character, backlit LCD interface to display the following values:
i. Flow rate in selectable rate units
ii. Forward totalizer in selectable volume units
iii. Reverse totalizer in selectable volume units

iv. Net totalizer in selectable volume units
v. Error or alarm messages
vi. Software revision level

Meter to be installed per manufacturer's recommendation.

2.3 SUBMITTALS (SHOP DRAWINGS)

The Contractor shall comply with the provisions of the Specifications regarding submittals. The following shall be included in submittals as a minimum. However, any additional information or data shall be added if and whenever requested by the Owner. Separate data for each pumping unit shall be submitted. Submittals shall be sent to the Engineer for review in digital PDF format.

Submittals shall contain descriptive literature as to dimensions and materials of construction. Performance data shall include size of pump, GPM, TDH, BHP, pump efficiency (inlet through discharge head), RPM, performance curves, shutoff head, weight of complete motor pump as a unit and discharge diameter.

Installation information shall include drawings and information necessary for connecting piping and valves, electrical connections, starting and auxiliary equipment. Submit drawings showing dimensions and scaled assembly outline of the complete pump and all associated equipment. Such drawings shall show plan, elevation and any other views or sections requested. For all pumping units, a scaled cross-sectional drawing of the assembled pump showing full details, parts lists of all items and materials of construction shall be submitted for approval.

A scaled drawing of the pump station, valve vault and meter vault top slabs shall be supplied showing the exact location of all hatches, vents, panel mounting pedestals, hoist sockets and internal wet well piping to be certain that all equipment will properly fit and can be installed and/or removed without undue effort. This drawing shall clearly show location of hinge side of hatch and an exact location of the hoist sockets to insure that each pump can be pulled in a perfectly vertical fashion.

The Contractor shall submit all other drawings, and other information specified, requested, and/or necessary to show complete compliance with all the details of the contract documents.

The pump manufacturer shall submit an Operations and Maintenance Manual containing all information necessary for proper operation and maintenance of pumping units as well as location of the nearest permanent service headquarters. The Operations and Maintenance Manuals shall detail all aspects of the pumps, including dimensions of impeller/wear rings, clearances, model number/size of

bearings, size of mechanical seals and related data. There shall be four (4) manuals submitted for each pumping station. These manuals must be submitted when pumps are delivered.

2.4 MANUFACTURER

The pumps shall be non-clog series pumps as manufactured by Myers or Engineer approved equal. All pumping units shall be an approved design, make and products of manufacturers who have built equipment of similar type, size, and capacity

The Contractor shall submit, upon request, any additional information that the Owner and/or the Engineer may deem necessary to determine the ability of the proposed manufacturer to produce the specified equipment.

Pumping units shall be products of manufacturers who can produce evidence of their ability to promptly furnish any and all interchangeable replacement parts as may be needed at any time within the expected life of the pumps.

Approval of manufacturers or suppliers will not be given until all information required by the specifications, or requested by the Owner has been submitted and found acceptable.

The Contractor shall provide, at no cost to the Owner, the services of an accredited representative of the pump manufacturer who shall supervise the installation and testing of each pumping unit and also give operating and maintenance instruction to the Owner's personnel. Pumping equipment shall be tested for performance according to curves and other approved data. Failure of the equipment to perform as curves indicate and with other approved data shall be sufficient cause for rejection. As one condition necessary to acceptance of any pumping unit, the Contractor shall submit a certificate from the manufacturer, stating that the installation of the pumping unit is satisfactory, that the unit is ready for operation, and that the Owner's operating personnel have been suitably instructed in the operation and maintenance of the unit.

3.0 EXECUTION

3.1 FACTORY TESTING

Each grinder pump shall be submerged, operated, and tested for compliance with published curve. Actual appurtenances and controls which will be installed in the field, shall be 100% factory tested. Manufacturer's test results shall be supplied showing the operation of each grinder pump at three (3) different points on its curve, with the maximum pressure no less than required by the system design. Each basin discharge assembly was factory leak tested in the basin prior to shipment.

3.2 START-UP AND FIELD TESTING

The services of a factory authorized technician will be required. The technician shall instruct and train installation and maintenance personnel in the proper procedures necessary to facilitate installation, start up, and operation in accordance with manufacturers' instructions. All equipment and materials necessary to perform testing shall be the responsibility of the Owner or installing Contractor. This will include, as a minimum, a portable generator (if temporary power is required) and water in each basin.

The services of the trained factory-authorized technician will be provided for two (2) trips to jobsite, two (2) days per trip.

Upon completion of the start-up and testing, those responsible for start-up shall submit to the Engineer the manufacturers start-up/warranty authorization form describing the results of the tests performed for each Pump Station. Final acceptance of the system will not occur until authorization forms have been received for each pump station installed. A copy of the start-up/warranty authorization form for each station must be forwarded to the manufacturer to demonstrate proper installation and to activate warranty.

3.3 DISSIMILAR METALS

When bronze or aluminum components come into contact with dissimilar metals, surfaces shall be kept from direct contact by painting the dissimilar metal with a heavy coat of primer recommended by the metal manufacturer/fabricator. When aluminum components come into contact with cement or mortar, exposed aluminum surfaces shall be painted with zinc chromate, or other paint recommended by the manufacturer/fabricator. Bituminous paints will generally be accepted for application to large surfaces. However, a more long lasting primer and paint system will likely be required for the nuts and bolts and other small fittings.

3.4 PUMP STATION SITE WORK

3.4.1 General. The Contractor shall perform the site work as described in this section and other sections of the specifications for the sewer lift stations.

3.4.2 Access. The Contractor shall grade and gravel the access area from each lift station to the nearest public road. The access area shall allow the district's vehicles to access the lift station to perform any necessary maintenance or repair. The access entrance should have crushed rock surface.

3.5 WET WELL AND VALVE VAULT – N/A

For fiberglass wet wells and valve vaults, the Contractor shall surround the wet well and valve vault with concrete to prevent floating of the wet wells or valve vaults. The volume of concrete used outside the wet wells or valve vaults shall be at least 72% of the volume of the wet well or valve vault. The concrete shall be placed around the bottom of the wet wells and valve vaults.

4.0 PAYMENT

The unit price bid shall constitute full compensation for installing the sanitary lift station, fittings, valves, and all electrical connections required to make the station fully operational as required by the power company.

DIVISION 13: SPECIAL CONSTRUCTION

SECTION 13210

DOUBLE WALL CHEMICAL STORAGE TANK

1.0 SCOPE

Contractor shall supply and install all materials, equipment, appurtenances, specialty items, and services required to provide an upright, double wall, flat bottom, closed top, polyethylene storage tank for storage of the chemical application(s) described in Table I. Each tank is to be molded in one-piece seamless construction according to ASTM D 1998 (laminated or fabricated tanks will not be accepted) and will be capable of storing the chemical application at atmospheric pressure.

2.0 GENERAL

This specification covers upright, double wall, flat bottom storage tank assemblies. The assembly consists of one cylindrical inner primary tank and one blended form octagonal outer secondary tank. Each tank is molded in one-piece seamless construction by rotational molding (laminated or fabricated tanks will not be accepted). The tanks are designed for above-ground, vertical installation and are capable of containing chemicals at atmospheric pressure. The assembly shall be designed to prevent rainwater from entering the containment tank. The design shall allow direct primary tank base retention for up to seismic conditions per IBC code requirements. The containment tank shall be designed to hold a minimum of 115% of the normal fill capacity of the primary tank. Included in this specification are requirements for material properties, design, construction, dimensions, tolerances, workmanship, and appearance.

3.0 MANUFACTURER

Tanks shall be manufactured by Snyder Industries Inc. or approved equal.

4.0 APPLICABLE DOCUMENTS

4.1 ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS) STANDARDS

D618 - Conditioning Plastics and Electrical Insulating Materials for Testing
D638 - Tensile Properties of Plastics
D790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
D883 - Definitions of Terms Relating to Plastics
D1505 - Density of Plastics by the Density-Gradient Technique

D1525 - Test Method for Vicat Softening Temperature of Plastics
D1693 - Test Method for Environmental Stress-Cracking of Ethylene Plastics
D1998 - Standard Specification for Polyethylene Upright Storage Tanks
D2765 - Degree of Crosslinking in Crosslinked Ethylene Plastics as Determined by Solvent Extraction
D2837 - Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
D3892 - Practice for Packaging/Packing of Plastics
F412 - Definitions of Terms Relating to Plastic Piping Systems

4.2 ARM (ASSOCIATION OF ROTATIONAL MOLDERS) STANDARDS

Low Temperature Impact Resistance (Falling Dart Test Procedure)

4.3 ANSI STANDARDS: B-16.5 Pipe Flanges and Flanged Fittings

4.4 OSHA STANDARDS

29 CFR 1910.106 Occupational Safety and Health Administration, Flammable and Combustible Liquids

4.5 UBC CODE: Uniform Building Code 2006 Edition

4.6 IBC CODE: International Building Code 2015 Edition

4.7 CBC CODE: California Building Code 2016 Edition

4.8 NSF/ANSI STANDARD 61: Drinking Water System Components (Type II resin)

4.9 40 CFR-264.193

5.0 TANK FITTINGS (NOZZLES)

5.1 VENTS

Each tank must be properly vented for the type of material and flow rates expected. Vents must comply with OSHA 1910.106 (f) (2) (iii) or other accepted standard. All tanks must be vented for atmospheric pressure as well as any pressure created by filling and emptying the tank. Some applications may require a sealed tank with a vent line going to a scrubber system for proper chemical safety. Venting equipment should be sized to limit pressure or vacuum in the tank to a maximum of 1/2" of water column (0.02 psi). U-Vents are offered in sizes from 1 in. to 6 in. with or without mesh insect screening. U-

Vents with mesh screening may require additional sizing due to reduced air-flow rates. Consult the manufacturer for necessary venting and placement information.

All u-vents shall be constructed of PVC or other specified materials.

5.2 FLANGE ADAPTERS

Flange adapters may be purchased as optional equipment to adapt threaded or socket fitting outlets to 150 lb. flange connections for connection to piping system components. Flange adapters are available in PVC. Flange adapter construction shall utilize schedule 80 components in sizes ranging from ¾" to 8" depending on material required.

5.3 FLEXIBLE CONNECTIONS

All tank fitting attachments shall be equipped with flexible couplers or other movement provisions provided by the tank customer. The tank will deflect based upon tank loading, chemical temperature and storage time duration. Tank piping flexible couplers shall be designed to allow 4% design movement. Movement shall be considered to occur both outward in tank radius and downward in fitting elevation from the neutral tank fitting placement.

The flexible connection is to be manufactured of the same material as the tank or a compatible material approved by the project engineer. If an elastomer flexible connection is used control bolts are required if recommended by the manufacturer. The flexible connection is to be designed for a minimum of 4% movement. The flexible connection is to be designed with 150# flange connections to allow for attachment to the tank and the piping system. The flexible connection is to be attached as close as possible to the tank to reduce stress.

6.0 TANK ATTACHMENTS

6.1 MANWAYS AND FILL CAPS

6.1.1 Manway and Fill Cap (Non-sealed)

Manways are available in an 18 in. vented or non-vented threaded design or hinged style (minimum opening diameter of 15 in.) and a 24 in. vented or non-vented threaded or hinged style (minimum opening diameter of 22 in.) on various tank sizes. Check the manufacture's specification drawing for availability and position. All caps and manways shall be constructed of polyethylene material.

6.2 BOLTED SEALED TOP MANWAY

Sealed manways are available in 14, 18, 20 and 24 in. sizes on certain tanks in selected positions. Consult the manufacturer for placement positions.

The sealed manway shall be constructed of polyethylene material. The bolts shall be polypropylene or other specified material. The gaskets shall be closed cell, crosslinked polyethylene foam and Viton o-rings to seal the bolts.

6.3 SURGE PROTECTION LID

The hinged lid is to be manufactured of polyethylene. The lid will be a 14 in. size with 11 in. access opening or 18" with 15" access. The opening of the lid is to be restricted by a tether. The lid is to be designed so that is will close when the pressure has been released. Check SII specification drawing for availability and position.

6.4 DOWN PIPES AND FILL PIPES

6.4.1 External Fill / Down Pipes

External fill pipes shall be prepared per the customer approved drawings and specifications. All external fill pipes shall be supported at 3 ft. maximum intervals with a support structure independent of the tank (ground supported). All designs shall be done according to the specific needs of the customer.

All external fill pipes shall be constructed of PVC or other specified materials.

6.4.2 Internal Fill / Down Pipes

Internal down pipes shall be prepared per the customer approved drawings and specifications. All internal down pipes shall be supported at 5 ft. maximum intervals with a support structure welded to the inside of the primary tank (only available in tanks constructed with Type II resin). The support design may utilize a PVC clamp or other specified materials for support. All designs shall be done according to the specific needs of the customer.

All internal down pipes shall be constructed of PVC or other specified materials.

7.0 TANK ACCESSORIES

7.1 LADDERS

7.1.1 Ladders shall be constructed of galvanized mild steel or FRP.

7.1.2 Safety cages shall be provided with ladders as optional equipment unless required by OSHA standards.

7.1.3 All ladders shall be designed to meet applicable OSHA standards. Reference: OSHA 2206; 1910.27; fixed ladders.

7.1.4 Ladders must be mounted to the tank to allow for tank expansion and contraction due to temperature and loading changes. All top ladder mounts shall be connected to integrally molded in attachment lugs that allow for tank movement due to temperature and loading changes.

7.1.5 Mild steel parts shall be deburred and galvanized.

7.2 TIE DOWN SYSTEMS

7.2.1 The tie down system shall be designed to withstand 150 MPH wind loads. Tie down systems must meet seismic requirements per IBC 2015 / CBC 2016 code with seismic loads ≤ .445g (Seismic Design Category "D" - Fa=1.0, Fv=1.5, Ss=1.4, S1=0.5). Anchor bolts shall be provided by the contractor per the calculations and the base plates for the system. A registered engineer's wet stamped calculations and or drawings may be required.

7.2.2 The tie down system shall be offered galvanized, 304 or 316 stainless steel.

7.2.3 Mild steel parts shall be deburred and galvanized.

8.0 WARRANTY

The tank shall be warranted for three years in regards to defects in materials and workmanship. The warranty on fittings and accessories supplied by the tank manufacturer will be for one year. The warranty will begin at time of shipment.

Snyder Industries may offer extended warranties on tanks (up to a maximum of 5 years) in regards to defects in materials and workmanship in certain applications or as a purchased option. Please consult Snyder Industries if you have any questions regarding extended warranty coverage and/or requirements.

DIVISION 15: MECHANICAL

SECTION 15102

SPECIAL ITEMS OF CONSTRUCTION

1.0 GENERAL

These specifications govern special crossings, installations and construction procedures required to deal with unusual construction items or special requirements of governing agencies.

2.0 MATERIALS

2.1 CASING PIPE

In general, the diameter, thickness, style, joints and materials selected for casing pipe shall be as shown on the plans or as specified herein and shall be considered as "minimum" requirements, all subject to prior approval of the Engineer. In all cases, the approval for construction by agreement with the private company and/or construction permit issued by the State, County, or Municipal agency will be required before construction starts.

Steel casing pipe for road and railroad crossings using the boring and jacking method shall be steel, plain end, uncoated and unwrapped, and shall be furnished in at least 18-foot lengths. Steel pipe shall meet the requirements of ASTM Standard A-120 and AWWA C200. Pipes up to and including four inches (4") in diameter shall be Schedule 40. Pipe larger than four inches (4") shall have a wall thickness equal to or greater than 0.312 inches under railroads and 0.250 for all other uses. The inside diameter of all casing pipes shall be a minimum of four inches (4") greater than the largest outside diameter of the carrier pipe, joint or coupling.

The steel casing pipe shall be bored and/or jacked in place at the locations as shown on the plans or as directed by the Engineer. All joints between lengths shall be solidly welded with a smooth non-obstructing joint inside. Any field welding shall be performed by a certified welder and shall be in accordance with AWWA C206. The casing pipe may be extended beyond the boring limits by open trenching as shown in the Standard Details. This would apply when the casing is required from right-of-way to right-of-way or ditch line to ditch line. Open trenching at jacked or bored locations will be allowed no closer than three feet (3') from the edge of pavement or toe of the slope embankment.

Positioning guides (insulators) shall be utilized on all carrier pipe which is within the casing pipe. Positioning shall be accomplished by the use of prebuilt spacers such as those manufactured by Calpico or an approved equal. The

Contractor shall submit the type of position guide proposed for use for the approval of the Engineer. Spacing of the positioning guides shall be in accordance with the Standard Drawings.

The ends of the casing pipe shall be plugged and made watertight in a manner acceptable to the Engineer prior to backfilling. Casing seals as manufactured by Pipeline Seal & Insulator, Inc. (PSI), Advance Products & Systems, Inc. (APS) or equal shall be used.

2.2 PAVEMENTS

The crushed stone backfill as noted on the drawings shall be dense #57 aggregate per Kentucky Transportation Cabinet Specifications. The Contractor shall continuously be responsible for the maintenance of the aggregate and the surface of the trenches until the pavement replacement is completed.

Portland cement concrete for pavement replacement shall contain a minimum of six (6) sacks of cement per cubic yard, the maximum free water content shall be six (6) gallons per sack of cement, the slump shall be between 2 and 4 inches, and the concrete shall have minimum 28-day compression strength of at least 3,500 PSI. Cement, aggregate and water shall be described in these specifications for Class "A" concrete. A set of cylinders shall be made and tested for each twenty-five cubic yards (25 yd^3) of concrete placed, or fraction thereof, to supply representative sampling and testing of the concrete, upon the direction of the Engineer. The Contractor shall produce a broomed, or burlaped uniformly smooth and nonskid surface, consistent with the existing pavement.

Bituminous materials and mixes shall be consistent with the recommended practice of the asphalt institute and it shall conform to the requirements of the Kentucky Transportation Cabinet for prime coat and Class 1 bituminous concrete. The bituminous concrete shall consist of a binder or base course and a surface course.

2.2.1 Concrete Pavement Replacement. This pavement replacement shall be Portland cement concrete construction in accordance with the requirements shown in the Standard Details. It shall include all pavement replacement on concrete surfaced roads, concrete driveways, concrete sidewalks and concrete parking areas, both public and private.

2.2.2 Heavy-Duty Bituminous Pavement Replacement. This type of asphalt pavement replacement shall be bituminous concrete surface over concrete base in accordance with the details. This type of pavement replacement shall be used on all heavily trafficked roads having an existing pavement greater than two inches (2"), whether public or private, or in other locations as directed by the Engineer.

2.2.3 Light-Duty Bituminous Pavement Replacement. This type of pavement replacement shall be bituminous concrete constructed in accordance with the details. This item shall include all light-duty bituminous concrete roadways, bituminous driveways and bituminous parking lots, both public and private.

2.2.4 Crushed Stone Surface Replacement. This type of surface replacement shall include all graveled roadways, driveways, parking areas, or other gravel surfaced areas, both private and public. This type of surfacing may also be required as a base course for other pavement replacement.

3.0 EXECUTION

3.1 STATE HIGHWAY CROSSINGS

In all cases, these crossings will be made in compliance with the requirements of the State Highway Department. Such requirements will normally be described by the appropriate District Highway Office. In general, unless otherwise shown on the plans or directed otherwise by the Engineer, the crossing of all State Highways shall be accomplished by boring under the roadway. In addition, the crossing of service lines two inches (2") and greater under rigid and flexible surfaced paved roads shall be accomplished by boring and jacking a casing pipe under said roadway. In certain cases, as shown on the plans, service lines of all sizes will require casing pipe installed with the crossing.

Where road crossings are made using plastic pipe or copper, the location of joints under the roadway should be avoided by using lengths of adequate dimension for the crossing. This principle also applies to other types of pipe where sufficiently long lengths are available.

3.1.1 Open Trench Crossings. The trench shall be excavated to a minimum width that will allow the pipe installation. The trench walls shall be kept as nearly vertical as possible. The minimum specified cover above the pipe shall be maintained. The Standard Details section shows the requirements for open trench crossings.

The backfill in the trench under any roads, driveways, or parking areas where the open trench method is used shall be of the type shown in the Standard Details and shall be deposited and compacted in uniform layers not to exceed the depth shown in the Standard Details.

The surface of the road, driveway, or parking area shall be replaced with the same type of material as specified under pavement replacement.

3.1.2 Boring and Jacking. The work is herein defined as the operations in which both the boring by auger and the jacking of the casing pipe are done mechanically and in which the diameter of the casing pipe is too small to permit

hand working at the heading of the casing pipe. Two basic methods are; (1) pushing the casing pipe into the fill or earth simultaneously as the boring auger drills out the ground; and (2) drilling the hole through the fill or earth and pushing the casing or carrying pipe into the hole after the drill auger has completed the bore.

A suitable approach trench shall be opened adjacent to the slope of the embankment, or adjacent to point of bored and jacked section as shown on the plans. The approach trench shall be long enough to accommodate the selected working room. Guide timbers or rails for keeping the casing pipe on line and grade shall be accurately set and maintained in the bottom of the approach trench and with heavy timber back-stop supports installed at the rear of the approach trench to adequately take thrust of the jacks without any movement or distortion. It is paramount to the securing of acceptable tolerance limits of workmanship in the boring and jacking operation that extreme care be taken in the setting of all guides, rails and jacks to the end that the casing pipe in final position be within the limits of acceptability for the placing and laying of the carrier pipe. The minimum cover of forty-two (42") inches under the roadway must be maintained. Additional depth may be required as shown on the plans.

3.1.3 Optional Directional Boring. The Contractor may be allowed to utilize directional boring in areas where right-of-way is narrow or where there are obstructions that make convential construction more difficult. In these the Contractor may with the Engineer's approval at no cost to the Owner proceed with directional boring. The depth of pipe shall be at least thirty six inches (36") deep (forty-two inches (42") under roads). The tracer person shall keep accurate logs of the depth when utilizing directional boring. Payment shall be the same as force main installation.

3.2 CREEK CROSSINGS

3.2.1 Special Creek Crossing. Where required on the plans or instructed by the Engineer, the Contractor shall construct a special creek crossing as shown in the Standard Details. Crossings shall be scheduled for construction in times of low flow, if practicable, otherwise cofferdams of sand bags or clay shall be used to divert the stream flow while crossing is made. Concrete shall not be placed under water and Contractor shall provide suitable pumps to keep water out of trench excavation during stream crossing construction.

3.2.2 Normal Earthen Creek Crossing. Where the stream crossing is made in earth or other beds which are stable (no casing or anchorage required), then the pipe will be laid in a narrow trench at the depth specified in the Standard Details to maintain the required cover between pipe and stream bed. Initial backfill will be mechanically compacted. Trench backfill in any stream crossing area from one foot (1') above the top of the pipe shall consist of trench excavated rock, if

available. No extra payment will be made above normal construction for this type of creek crossing.

3.3 WATER LINES AND SEWER LINES SEPARATION

3.3.1 General. Wherever sewer lines cross, or are adjacent to, each other, special precautions shall be taken.

3.3.2 Parallel Water and Sewer Lines. Water lines must, if possible, be located a minimum lateral distance of ten feet (10') from any existing or future sewer lines measured from outside diameters. Where water lines and sewer lines must be placed in the same trench, the water line must be located on a shelf, two feet (2') above and two feet (2') to the side of the sewer line. Whenever this condition cannot be met, and upon direction from the Engineer, the water line shall be uncovered and encased with concrete per the standard encasement detail.

3.3.3 Crossing Water and Sewer Lines. Wherever sewer lines and water lines cross, it is desirable, if practical, that the sewer line be at least twenty-four inches (24") below the water line.

Where it is not practical to provide such a separation, care shall be taken to ascertain that the existing water line or existing sewer line is in good sound condition and that no evidence of joint leakage is known in that vicinity. If any such evidence does exist, the existing line shall be exposed by the Contractor at least ten feet (10') each side of the new pipe crossing, carefully examined and any defects positively corrected. The Owner will arrange for examining and correcting any defects in the existing lines, but the Contractor shall cooperate in every way possible.

When the water line must be below or less than two feet (2') above the sewer line, the Contractor shall encase the water line five feet (5') in each direction from the crossing as directed by the Engineer. This encasement should only be accomplished when directed by the Engineer and shall be accomplished in accordance with the details shown on the drawings. The encasement is a separate pay item.

3.4 CLEANUP, SEEDING AND SODDING

Upon completion of the installation of the work, the Contractor shall remove all debris and surplus construction materials resulting from the work. The Contractor shall fine grade all the disturbed surfaces around the area of the work in a uniform and neat manner leaving the construction area in a condition as near as possible to the original ground line or to the lines as directed by the Engineer. The Contractor shall provide effective cleanup of the work as it progresses. Procrastination of cleanup will not be to berated.

3.4.1 Rough Grade Work and Cleanup. Rough Grade Work and Cleanup (Rough Cleanup) shall be defined to include the final backfill and windrowing of the ditch line, disposal of excess excavated material, level grading of the disturbed areas adjacent to the ditch line, filling and leveling street and driveway cuts, cleaning up and removal of rubbish, repair of fences and structures, and any other such work that may be required to result in a neat, orderly project area. Rough Cleanup shall be performed as other construction progresses and must be completed within **one week** of the adjacent pipeline construction.

Rough Cleanup is not a separate pay item. The cost for this work shall be included in the unit bid price for water lines. If Rough Cleanup is not performed as specified, the OWNER, after notification to the Contractor, will refuse payment for additional pipeline installation until the Rough Cleanup is accomplished.

3.4.2 Final Cleanup. Final cleanup, grade work and seeding shall be performed on each line when backfilled trenches have had adequate time to settle, but at least within **thirty (30) days** from the date each line is constructed. Final grade work and seeding on Kentucky Transportation Cabinet rights-of-way shall be done in accordance with said Cabinet's specifications and the permit granted to the Owner specifically for this project.

Where work was performed on private property in lawns, earth of good quality, free from rock shall be spread over the disturbed area and graded and compacted to match adjacent ground contours. The graded and seed bed area shall be prepared with a power landscape rake and further hand raked if necessary, until smooth and free from rock, potholes, and bumps. The disturbed area shall then be seeded with the seed variety used on the original lawn (e.g., a bluegrass lawn shall be reseeded with bluegrass seed). In the case of no preference by the Owner, the mixture of grasses shall consist of one-third (1/3) Rye grass, one-third (1/3) Kentucky Fescue and one-third (1/3) Kentucky Bluegrass by weight and shall be applied in accordance with the supplier's recommendations. The area shall be fertilized with 12-12-12 fertilizer applied at a rate of 6 pounds per 1,000 square feet of area. After the seed and fertilizer have been applied, the Contractor shall then lightly cover the seed by use of a drag or other approved device. The seeded area shall then be covered with clean straw to a depth of approximately one (1) inch.

Where work was performed on private property and not in lawns the trench line shall be graded and filled if necessary to match adjacent contours. All rock larger than 1-1/2" in diameter shall be removed from the disturbed area. In general, pasture and fallow land shall be fertilized and seeded with Kentucky 31 Fescue and plowed fields shall be left unseeded, however, the desire of each property owner shall govern regarding seeding. The entire pipeline length that is seeded shall be strawed.

In all cases on private property the rate of seed and fertilizer application shall be that recommended by the material supplier or the University of Kentucky Cooperative Extension Service for new plantings of the variety of grass seed used.

If the trench line settles following final grade work or if grass seed fails to germinate within a reasonable time, the Contractor shall regrade or reseed the area in question as specified above and as directed by the Engineer.

Final cleanup is not a separate pay item.

3.5 PAVEMENT REPLACEMENT

The Contractor shall replace all pavement cut or disturbed, with pavement similar in all respects to existing pavement in accordance with the Standard Details and at those locations approved by the Engineer. Every effort shall be made to avoid cutting the pavement. In restoring pavement, new pavement is required, except that granite paving blocks, sound brick or sound asphalt paving blocks may be reused. No permanent paving shall be placed within thirty (30) days after the backfilling has been completed. All concrete and asphalt paving materials shall be in conformance with the Standard Details shown in the plans. The pipeline trench through all paved areas (parking lots, driveways, roads, etc.) shall be fully backfilled with crushed stone.

The Contractor shall cut back the surfacing adjacent to the trench for twelve inches (12") on both sides of the trench and shall cut down the dense graded aggregate he has placed to a depth required for either type of pavement replacement. The resulting surface shall be rolled to yield a smooth, dense surface and a uniform depth.

The concrete shall be placed in accordance with standard practice, with the welded wire mesh if required in proper position and thoroughly vibrated into place. The Contractor shall produce a surface consistent with the existing pavement. The Contractor shall apply a liquid curing component, sprayed on the surface of the concrete, and shall provide adequate protection to the pavement until it has set.

For bituminous concrete, the Contractor shall clean and broom the prepared surface, then apply the prime coat at the rate of 0.20 to 0.25 gallons per square yard, with a pressure distributor or approved pressure spray method. When the prime coat has become tacky but not dry and hard, the bituminous binder course, or base course, whichever applies, shall be placed and compacted. The Contractor shall then apply the surface course. It is recommended, but not required, that the base course remain in place for approximately one week before placing the surface course. The finished course shall be compacted and the completed surface shall match the grades and slopes of the adjacent existing

surfacing and be free of offsets, depressions, raised places and all other irregular surfaces.

3.5.1 Seasonal and Weather Limitations for Pavement Replacement. In the event the progress and scheduling of the work is such that the bituminous pavement replacement would occur in the winter months, during adverse cold weather and/or during such times the asphalt plants are not in operation, then the final pavement replacement shall be postponed until favorable weather occurs in the spring and the asphalt plants resume normal operations. No bituminous concrete shall be laid when the temperature is below 40°F except by written permission of the Engineer.

Concrete pavement shall not be placed when the temperature is such that the pavement placed will freeze before it has had adequate time to set and shall be placed in conformance with the temperature conditions specified in these specifications.

The Contractor shall be responsible for replacement of pavement which he has placed which has been damaged by cold weather or freezing without additional compensation.

In the meantime, the Contractor will be required to maintain the temporary surfacing until the permanent pavement is placed. Such labor, materials and equipment as is required for temporary maintenance of the streets, roadways and driveways shall be provided at the Contractor's expense and is not a pay item. The Contractor will be required to use a cold mix asphaltic concrete as a temporary surface for trenches under heavy traffic use.

3.5.2 Guarantee. The one year guarantee as specified in the contract documents is also applicable to trench settlement and pavement replacement.

3.6 SIDEWALK AND DRIVEWAY REPLACEMENT

Sidewalks and driveways will be replaced if damaged by the Contractor in any way.

Materials and dimensions are to be at least equal to existing pavement and are to conform with the Standard Details and section 3.5 of the specifications.

3.7 PAYMENT FOR WATER

All water used from the Utility shall be metered with meters supplied by the Contractor. The Contractor shall pay for such water monthly at the rates published by the water utility. Unmetered water lost through water line breakage shall also be paid at the rates published by the water utility. The quantity lost

shall be computed on the basis of a discharge velocity of 7 feet/second, the diameter of the line, and the estimate duration of free uncontrolled discharge.

3.8 FINAL CLEAN-UP

The Contractor shall provide effective cleanup of the work as it progresses. Procrastination of cleanup will not be tolerated. At the time of final inspection, no trenchs shall show any undue evidence of the previous construction. All areas shall be left free of ruts due to construction equipment and shall have a clean and neat appearance without rubble or debris. The areas shall not be mounded up and shall be completely restored, and all yards and fields shall be reseeded so land may be cultivated, mowed, etc. Straw and fertilizing shall accompany the seeding in accordance with Section 3.5 - Seeding. If necessary to hasten proper restoration of terraces, principally along ditch lines, the Contractor shall sod such areas at the Engineer's direction. For all line segments, final cleanup shall be performed within 30 days from day of installation.

3.9 PROTECTION OF ADJACENT LANDSCAPE

Reasonable care shall be taken during construction of the sewer lines to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing.

In the course of construction, the Contractor may deflect horizontal alignment of the water line to avoid trees and to keep from damaging their roots. The Contractor shall be fully responsible for settling all claims by private property owners concerning damage to trees and shrubs.

4.0 PAYMENT

Casing pipe unit price bids shall include the cost of boring or jacking under highways and shall include the cost of steel casing pipe. Carrier pipe will be paid for under the unit price bid for installing lines as described in Section 15101.

Payment for special creek crossings will be at the unit price bid per lineal foot for that item and shall include encasement pipe, crushed stone, concrete, solid rock excavation and all other work necessary for a satisfactory installation. The carrier pipe installed in the casing shall be paid separately under the unit price bid for pipe installed.

Additional costs for normal earth creek crossings shall be included in the unit price bid for pipe installation and no special payment will be made for these crossings.

Payment for crushed stone, asphalt and concrete pavement replacement will not be based on the quantities purchased by the Contractor. Payment for surfacing will be paid on the basis of linear feet installed in accordance with the Standard Drawings with a maximum width of pipe diameter plus twenty-four inches (24"). Crushed stone sub-grade under paving shall be included in paving price and not paid for separately. Any additional cost estimated by the Contractor must be included in the cost of pipe in place. Only pavement necessarily damaged by sewer line installation is eligible for payment. Pavement otherwise damaged shall be replaced at contractor's expense.

Any other item in this section which does not have a payment method described shall be considered incidental to the unit price bid for sewer line installation.

SECTION 15120

FORCE MAINS

1.0 GENERAL

The Contractor shall furnish all labor and equipment to install the water lines as shown on the plans and as specified herein.

The water lines may either be pressure-rated plastic pipe (PVC), municipal plastic pipe (MPVC) or ductile iron (DI), all as specified hereinafter. The bid documents shall show the locations and amounts of each type and class of pipe to be installed by the Contractor.

The Owner will obtain all rights-of-way for operations through private property. It will also secure building permits and the permits for all pipe laid in highway rights-of-way. Any charges for inspections or other fees required will be the responsibility of the Contractor since the amounts of these are dependent upon the operation of the Contractor.

2.0 MATERIALS

2.1 POLYVINYL CHLORIDE (PVC) PIPE

PVC pipe shall comply with ASTM D-1784 for material and shall be Class 250 (SDR-17) as shown on the PLANS or indicated in the proposal form. (SDR PR, Type 1, Grade 1). All PVC pipe shall conform to the latest revisions of the following specifications:

ASTM D2241 (PVC Plastic Pipe SDR-PR and Class T)

The name of the manufacturer of the plastic pipe to be used must be found on the current listing of Plastic Materials for Potable Water Application, published by the NSF (National Sanitation Foundation), Ann Arbor, Michigan, and must meet the requirements of the Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe, D1784, 12454-B (PVC 1120) published by ASTM. Rubber gaskets shall conform to ASTM D3139.

Wall thickness shall be in accordance with ASTM D-2241. Pipe ends shall be beveled to accept the gasketed coupling. The bell section shall be designed to be at least as strong as the pipe wall.

Samples of pipe, physical and chemical data sheets shall be submitted to the Engineer for approval and his approval shall be obtained before pipe is purchased.

The pipe shall be homogeneous throughout and free from cracks, holes, foreign inclusions, or other defects. The pipe shall be as uniform as commercially practical in color. The pipe for all sewer lines shall be green in color. Pipe shall have a ring painted around spigot ends in such a manner as to allow field checking of setting depth of pipe in the socket. Pipe must be delivered to the job site by means that will adequately support it, and not subject it to undue stresses. In particular, the load shall be so supported that the bottom rows of pipe are not damaged by crushing. Pipe shall be unloaded carefully and strung or stored as close to the final point of placement as is practical.

Pipe markings shall include the following, marked continuously down the length:

Manufacturer's Name
Nominal Size
PVC 1120
Class Pressure Rating
Identification Code

Lubricant shall be water soluble, non-toxic, non-objectionable in taste and odor imparted to the fluid, non-supporting of bacteria growth, and have no deterioration effect on the PVC or rubber gaskets.

2.2 POLYETHYLENE HDPE PIPE

The polyethylene base resin shall meet all requirements of ASTM D-1248 for Type III Grade P34, Category 5 and has a PPI rating of PE 3408 by the plastic pipe institute.

The pipe and fittings produced from this resin shall have a cell classification of PE 345434C under ASTM D-3350 and meet or exceed all the requirements.

All pipe shall meet AWWA C906 standards and shall be clearly marked on each joint of pipe. All PE pipe used for sewer lines shall be marked with a green stripe.

High density polyethylene pipe shall be joined by means of a butt fusion as per manufacturer's recommendations.

2.3 FITTINGS

Ductile iron mechanical joint fittings with appropriate adaptors shall be used with pipe. All such fittings shall be approved by the pipe manufacturer, and complete data sent to the Engineer, including the manufacturer's approval, for review. Fittings shall comply with AWWA C110 or C111 and shall be manufactured for the size and pressure class of the line on which they are used.

2.4 UNDERGROUND MARKING TAPE

At all locations where PVC pipe is utilized, a detectable underground marking tape shall be placed in the trench approximately six inches below the finished grade. The tape used shall be mylar encased aluminum foil with the printing "CAUTION - Buried Sewer Line Below". Printing shall be readable through the clear mylar and surface printing is not acceptable. Tape size shall be 2-inch width as provided by Lifeguard, Inc. or approved equal. Color of the tape shall be green for the force main.

2.5 UNDERGROUND MARKING WIRE

At all locations where PVC or polyethylene pipe is utilized, a #12 solid strand wire shall be placed along all pipe. At location every 700 feet, the wire shall be brought up to three feet (3') above the ground surface. All wire shall maintain continuity along all pipe in the sewer system. Connecting the wires will require wire nuts with tape.

3.0 EXECUTION

3.1 RESPONSIBILITY OF CONTRACTOR

When material deliveries are made, a representative of the Contractor and Owner shall be present to inspect the material and the handling and storage activities. The materials to be installed by the Contractor will be delivered to the site(s) established by the Contractor. Security of the materials storage shall be the responsibility of the Contractor. The cost of any lost or stolen materials shall be borne by the Contractor. The representatives of both the Contractor and Owner shall sign the delivery invoices. The Contractor shall be responsible for the materials purchased by the Owner and delivered to the site as if the materials were furnished by the Contractor.

3.2 HANDLING AND STORAGE OF MATERIALS

The Contractor will be required to deliver all equipment and other materials and place same where required for installation. Care must be exercised in the handling of all materials and equipment and the Contractor will be held responsible for all breakage or damage to same caused by his workmen, agents, or appliances for handling or moving. Pipes and other castings shall in no case be thrown or dropped from cars, trucks, or wagons to the ground, but same shall be lowered gently and not allowed to roll against or strike other castings and unyielding objects violently. Pipe and other castings may be distributed at places that will not interfere with other building operations and unloaded, or yarded and distributed as required, as the Contractor may elect.

Valves, castings, fabricated metal, reinforcing steel, etc. shall be yarded or housed in some convenient location by the Contractor and delivered on the ground as required. All equipment and materials subject to damage from the weather, dampness, changes in temperature, or exposure shall be protected by a dry, weatherproof enclosure until ready for installation or use. The cost of all hauling, handling, and storage shall be included in the prices bid installation in place. The Owner takes no risk or responsibility for fire, flood, theft, or damage until after the final acceptance of work.

3.3 HAULING AND STORAGE

The Contractor shall notify the Engineer when pipe will be received on the job so that proper arrangements may be made for inspecting the unloading and stringing, as well as inspecting and examining the pipe materials.

All pipe shall be covered with tarpaulin during hauling from the manufacturer to the job site. It is acceptable for the front end only to be covered. The intent is to prevent diesel exhaust residue from coating the pipe and/or contaminating the gaskets.

Care must be exercised in the handling of all materials and equipment. The Contractor will be held responsible for all breakage or damage to items caused by his workmen, agents, or appliances for handling or moving. Pipes and other castings shall in no case be thrown or dropped from cars, trucks, or wagons to the ground, but shall be lowered gently and not allowed to roll against or strike other castings and unyielding objects violently.

Valves, castings, fabricated metal, reinforcing steel, etc. shall be yarded or housed in some convenient location by the Contractor and delivered at the construction site as required. All equipment and materials subject to damage from the weather, dampness, changes in temperature, or exposure shall be protected by a dry, weatherproof enclosure until ready for installation or use. The cost of all hauling, handling, and storage shall be included in the prices bid for equipment and materials in place. The Owner takes no risk or responsibility for fire, flood, theft, or damage until after the final acceptance of the work.

3.4 LINES AND GRADES

The Contractor will be required to accomplish any detailed layout, including that required for establishing the grade of the pipe line.

3.5 TRENCH EXCAVATION

3.5.1 General. This section describes the acceptable methods of trenching for the installation of pressure pipe and casing pipe in an open trench.

Trenching may be accomplished by means of a backhoe or by hand depending on the construction area. No trenching machines shall be used.

At the Contractor's option, trenching by backhoe is acceptable except as noted below:

Where the pipe line is being constructed close to other utilities, structures, building, or large trees, and it is reasonable to anticipate possible damage from the use of a backhoe, then trenching shall be made by hand methods.

The Contractor shall include in his unit price bid, all trenching necessary for installation of all pipelines as planned and specified. Trenching shall include all clearing and grubbing, including all weeds, briars, trees, stumps, etc. encountered in the trenching. The Contractor shall dispose of any such material by burning, burial, or hauling away (or as noted on the drawings), at no extra cost to the Owner. It shall be the Contractor's responsibility to notify the appropriate State and local Air Pollution Control agencies when he conducts open burning of refuse. Ornamental shrubs shall be removed, protected, and replanted. Trenching also includes such items as minor street, road, sidewalk, pipe and small creek crossings, and cutting, moving or repairing damage to fences, poles, gates and/or other surface structures regardless of whether shown on the plans.

The Contractor shall protect existing facilities against danger or damage while pipeline is being constructed and backfilled, or from damage due to settlement of this backfill. In case of damage to any existing structures, repair and restoration shall be made at once and backfill shall not be replaced until this is done. In all cases, restoration and repair shall be such that the damaged structures will be in as good condition and serve its purpose as completely as before and such restoration and repair shall be done without extra cost to the Owner. The use of trench-digging machinery will be permitted except where its operations will cause damage to trees, buildings or existing structures above or below the ground. At such locations hand methods shall be employed to avoid such damage. All excavated material shall be piled in a manner that will not endanger the work and will avoid obstructing sidewalks and driveways. Gutters shall be kept clear or other satisfactory provisions made for street drainage.

All excavation shall be open trenches, except where the drawings call for tunneling, boring, or jacking under structures, railroads, sidewalks and roads. The construction procedure for these types of excavation is described elsewhere in these specifications.

All trench excavation shall be termed unclassified and costs shall be included in the unit price bid for the pipe.

3.5.2 Clearing. The Contractor shall accomplish all clearing and/or grubbing as required for the construction under this contract. Clearing and grubbing shall

include the cutting and removal of trees, stumps, brush, roots, logs, fences and other loose or projecting material and natural obstructions which, in the opinion of the Engineer, must be removed to properly construct and operate the facilities. Ornamental shrubs, plantings, fences, walls, etc. shall be removed and replanted or replaced or protected from the construction activity. Clearing and/or grubbing shall be incidental to the various bid items and no additional compensation will be paid for same.

3.5.3 Trench Depth. Trenches shall be excavated to the line and grade required for the installation of pipe at the elevations indicated on the plans. The minimum depth of cover shall be 30 inches above the top of the pipe, unless shown otherwise on the plans or on the Standard Details. When the pipe is laying in or on solid rock, the minimum depth of cover shall also be 30 inches above the top of the pipe. No additional compensation will be made for extra depth where required by the plans or due to Contractor error. Excavation, except as required for exploration, shall not begin until the proposed work has been staked out. Materials which are not required for backfill and site grading shall be removed and disposed of as directed by the Engineer. Hauling, bedding, and backfilling shall be considered incidental to the various bid items and will not be paid for directly. Excavation shall be of sufficient depth to allow the piping to be laid on the standard pipe bedding in accordance with the section 3.6. The trenches shall be excavated to a minimum of six inches below the bottom of the pipe barrel in rock. In all cases where lines are under traffic a minimum cover of forty-two inches (42") shall be provided. Should it be necessary to avoid existing utilities, culverts, outlets, or other structures, the water line shall be carried deeper at no additional expense to the Owner.

Where the plans call for extra trench depth, this extra depth shall be provided at no extra cost.

3.5.4 Trench Width. Trench widths shall exceed the minimum width that will provide free working space on each side of the pipe and to permit proper backfilling around the pipe as shown in the accompanying table and unless specifically authorized by the Engineer, shall not be excavated to wider than two feet (2') plus the nominal diameter of the pipe at the top of the trench. Before laying the pipe, the trench shall be opened far enough ahead to reveal any obstruction that may necessitate changing the line and grade of the pipe. Should the Contractor fail to accomplish this, and changes are required, they shall be at his sole expense. In rock, all ledge rocks, boulders and large stones shall be removed to provide six inches (6") of clearance on each side and below all pipe and fittings.

Minimum Trench Width

Size	Width	Size	Width
Up to 4" Pipe	1'-6"	15" Pipe	2'-8"
6" Pipe	2'-0"	16" Pipe	2'-8"
8" Pipe	2'-0"	18" Pipe	3'-0"
10" Pipe	2'-4"	20" Pipe	3'-2"
12" Pipe	2'-6"	21" Pipe	3'-4"
14" Pipe	2'-6"	24" Pipe	3'-8"

3.5.5 Shoring, Sheeting, and Bracing of Excavation. Where unstable material is encountered, or where the depth of the excavation in earth exceeds five feet (5'), the sides of the trench or excavation shall be supported by substantial sheeting, bracing, or shoring. The design and installation of all sheeting, sheet piling, bracing or shoring shall be based on computations of pressure exerted by the materials to be retained under retaining conditions. Adequate and proper shoring of all excavations will be the entire responsibility of the Contractor. The Standards of the Federal Occupational Safety and Health Act and the Kentucky Department of Labor shall be followed.

The Engineer will not be responsible for determining requirements for bracing or sheeting.

3.5.6 Removal of Water. The Contractor shall provide for adequate removal of all water and the prevention of surface water from entering the excavation. The Contractor shall maintain dry conditions within the excavations until the backfill is placed. No additional compensation will be paid for replacement and/or stabilization of prepared excavations due to flooding and/or deterioration from extended exposure. All water pumped or drained from the excavation shall be disposed of in a suitable manner without damage to adjacent property or to other work under construction.

3.5.7 Pavement Removal. Pavement removal shall be as indicated on the plans or directed by the Engineer. When so required, or when directed by the Engineer, only one-half (1/2) of the street crossings or road crossings shall be excavated before placing temporary bridges over the side excavated, for the convenience of the traveling public. All backfilled ditches shall be maintained in such a manner that they will offer no hazard to the passage of traffic. The convenience of the traveling public and the property Owners abutting the improvements shall be taken into consideration. All public or private drives shall be promptly backfilled or bridged at the direction of the Engineer. Pavement replacement shall be in accordance with Section 15120 of these specifications. Excavated materials shall be disposed of so as to cause the least interference and in every case the disposition of excavated materials shall be satisfactory to the Engineer.

3.5.8 Traffic Maintenance. The Contractor shall be held responsible for any damage that may occur to persons or property by reason of the failure of the Contractor to properly guard and flag all open trenches or obstructions along the routes of the sewer lines. The Contractor at his own expense shall maintain warning signs, barricades and watchmen or flag men to control traffic at such times as his work would interfere with the flow of traffic. No excavation shall begin that may present a safety hazard unless the signs, barricades, lights, etc. are available to protect the open excavation at the conclusion of the day. The Contractor will comply with all Federal and State Occupational Safety and Health requirements for this type of construction. The Contractor shall also comply with all local and Kentucky Department of Highways requirements for signing and traffic control.

3.5.9 Line Location. The location of pipelines and their appurtenances as shown are those intended for the final construction. However, conditions may present themselves before construction on any line is started that would indicate desirable changes in location. In such cases, the Owner reserves the right to make reasonable changes in line and structure locations without extra cost, except as may be determined by extra units of materials and construction actually involved. The Owner is under no obligation to locate pipelines so they can be excavated by machine.

3.6 BEDDING OF PIPELINE

In all cases the foundation for pipe shall be prepared so that the entire load of the backfill on top of the pipe will be carried uniformly on the barrel of the pipe. The bells of the pipe shall not carry any of the load of the backfill. The Contractor should refer to the Standard Details for pipe bedding shown in the plans. The bedding specifications shall govern the backfill from the bottom of the trench up to the centerline or spring line of the pipe.

3.6.1 Stable Earth Foundation. On all PVC pipelines, the trench bottoms shall be smooth and free of frozen material, clodded dirt and stones over 1/2" diameter. Bottom dirt left by trenching equipment will usually provide adequate material to level the trench bottom and provide bedding support for the pipe barrel. If the trench bottom is free of dirt, soft material may be shoveled off the side walls or shoveled under the pipe to insure proper pipe barrel bedding. In areas where the trench bottom is hard, a layer of soft backfill must be provided to insure the pipe barrel is properly cushioned. See the plans for proper bedding material depth.

If the foundation is good firm earth the pipe may be laid directly on the undisturbed earth provided the pipe barrel is supported for its full length.

Bedding of No. 9 stone, fine gravel, sand or compacted finely graded select earth shall be used to correct irregularities in the subgrade.

As an alternative to the above method, excavation may be undercut to a depth below the required invert elevation that will permit laying the pipe on a bed of granular material or finely graded select earth to provide continuous support for the pipe barrel. Bedding depth shall be as shown on the plans.

The bedding is not a separate pay item and shall be included as incidental expense in the unit price for the pipe bid per foot of pipe.

3.6.2 Trenches In Rock. All installation in rock will utilize the undercutting method. Bedding will be with 6 inches crushed stone or suitable earth material.

3.7 PIPE LAYING

3.7.1 General. Proper instruments, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. Each pipe manufacturer shall have an experienced representative on the job for at least one day at the commencement of jointing and laying operations.

Before any length of pipe is placed in the trench, a careful inspection shall be made of the interior of the pipe to see that no foreign material is in the pipe. In order to properly remove any foreign materials, a swab of necessary length is to be available at all times.

All pipe shall be lowered carefully into the trench, properly aligned and properly jointed by use of suitable tools and equipment, in such a manner as to prevent damage to water line materials and protective coatings and linings. Excessive scratching of the exterior surface of the pipe will be cause for rejection of the pipe.

Under no circumstances shall pipeline materials be dropped or dumped into the trench. The pipe and fittings shall also be inspected for the purpose of determining if they are sound and free from cracks. Laying of pipe shall be commenced immediately after excavation is started. Pipe shall be laid with bell ends facing in the direction of laying.

When pipe laying is not in progress, the open ends of pipe shall be closed by approved means to prevent entrance of trench water into the line. Whenever water is excluded from the interior of the pipe, adequate backfill shall be deposited on the pipe to prevent floating. Any pipe which has floated shall be removed from the trench and relaid as directed by the Engineer. No pipe shall be laid in water or on frozen trench bottom, or whenever the trench conditions or the weather are unsuitable for such work.

If any defective pipe and fittings shall be discovered after the pipeline is laid, they shall be removed and replaced with a satisfactory pipe or fitting without additional charge to the Owner. Open ends of unfinished pipe lines shall be securely plugged or closed at the end of each day's work or when the line is left temporarily at any other time.

3.7.2 Laying Ductile Iron Pipe. Ductile iron pipe shall first be thoroughly cleaned at joints, then joined according to instructions and with tools recommended by the manufacturer. Three (3) copies of instructions shall be furnished to the Engineer and one (1) copy shall be available at all times at the site of the work. The lining inside ductile iron pipe must not be damaged by handling.

All pipes must be forced and held together, or "homed" at the joints, before sealing or bolting. Pipe must be aligned as each joint is placed, so as to present as nearly true, straight lines and grades as is practical, and all curves and changes in grades must be laid in such a manner that the manufacturer's recommended maximum deflection is not exceeded at any joint.

Cutting of pipe may be done by wheeled pipe cutters or saws as the Contractor may elect, but the Contractor will be held responsible for breakage or damage caused by careless cutting or handling.

All ductile iron pipe shall be installed per AWWA C150 Laying Condition Type 3 unless otherwise noted, six inches (6") crushed stone bedding or suitable earth shall be used in rock. No pipe shall be laid resting on rock, blocking, or other unyielding objects. Jointing before placing in trench, and subsequent lowering of more than one section jointed together may be allowed, subject to the Engineer approval and direction.

When using pipe with push-on joints care must be exercised to make certain that the correct gasket is being used for the type of joint installed and that the gasket faces the proper direction. Before inserting the gasket, the groove and bell socket should be carefully cleaned of all dirt. If sand or dirt is permitted to remain in the groove, leaks may occur. Lubricant must be applied to bell socket, gasket and plain-end of pipe as required by manufacturer. Plain-end must be beveled before joint is made. Deflection required at the joint shall be obtained after the joint is made.

3.7.3 Laying Plastic Pipe. The trench bottom must be smooth and uniform and the alignment must conform to the plans. Bedding and cover as specified herein and shown in the Standard Details is required.

To make a clean and unobstructed joint, it is necessary to wipe the ring, groove and pipe spigot free from all foreign materials at the time of assembly. The ring must be positioned properly in the fitting to receive the pipe by a worker who is

not in contact with the lubricant. In general, the lubricant is applied to the spigot (not the ring or groove). However, the manufacturer's instructions are to be followed in all cases. Only an approved lubricant may be used in accordance with the manufacturer's recommendations. All plastic pipe shall be joined by hand.

Where good bedding conditions are obtained PVC pipe smaller than four (4") inches may be assembled outside the trench in longer sections (as conditions allow) and then lowered into the trench. At any time when improper bedding is discovered or the pipe is severely deflected the pipe will be removed from the trench and the condition corrected. Pipe in sizes four inch (4") and above may be assembled outside the trench but must be lowered into the trench as each joint is assembled. Regardless of installation methods all joints must be inspected after laying in trench for proper insertion and alignment. Field cuts and bevels will be allowed in accordance with the manufacturer's recommendations for these operations. A new reference mark shall be installed before joining any field cut pipe. The same requirements for clearance from rock or other objects, thrust blocking and deflections shall apply to PVC pipe as for other pipe materials.

3.7.4 Installation of River Crossing Pipe. The ball joint pipe shall be assembled and installed in accordance with manufacturer's recommendations. Installation shall be made at time of low flow, using cofferdams as necessary to divert stream flow. The ball joint pipe shall be laid and allowed to settle before joining to the pipe on each side of the stream. The ball and joint pipes shall be tested separately once in place to detect any leaks or bad joints. After connecting to the land pipe, it shall be tested the same as specified for the other water mains. See the Drawings for additional installation requirements.

3.8 BACKFILLING

Backfilling must be started as soon as practicable after pipe has been laid. The Engineer shall be given a minimum of eight hours (8) for inspection before backfilling. The backfill shall be crushed rock, sand, or finely divided earth free from debris, organic material and stones, places simultaneously on both sides of pipe to the same level by hand.
In backfilling of the lower part of the trench beginning at the top of the bedding, the backfill material shall be carefully selected and walked-in around the pipe in 6" layers to a point eight inches (8") higher than the top of the pipe. The filling of the trench and the tamping of the backfill shall be carried on simultaneously on both sides of the pipe in such a manner that the completed pipe line will not be disturbed and injurious side pressures do not occur.

After the above specified backfill is hand placed, rock may be used in the backfill in pieces no larger than eighteen inches (18") in any dimension and to an extent not greater than one-half (1/2) the backfill materials used. If additional earth is

required, it must be obtained and placed by the Contractor. Filling with rock and earth shall proceed simultaneously, in order that all voids between rocks may be filled with earth. Above the hand placed backfill, machine backfilling may be employed without tamping, (if not contrary to specified conditions for the location) provided caution is used in quantity per dump and uniformity of level of backfilling. Backfill material must be uniformly ridged over trench and excess hauled away, with no excavated rock over 1-1/2 inch in diameter or pockets of crushed rock or gravel in top six inches (6") of backfill. Ridged backfill shall be confined to the width of the trench and not allowed to overlap onto firm original earth and its height shall not be in excess of needs for replacement of settlement of backfill. All rock, including crushed rock or gravel from construction, must be removed from yards and fields. Streets, roadways and walks shall be swept to remove all earth and loose rock immediately following backfilling.

In the case of street, highway, railroad, sidewalk and driveway crossings or within any roadway paving or about manholes, valve and meter boxes, the backfill must be machine tamped in not over four-inch (4") layers, measured loose in accordance with the standard details. Where backfill is under paved driveways, streets, highways, railroads, sidewalks, paved parking areas and other areas where settlement is not allowed, crushed stone or coarse sand backfill only shall be used up to the paving surface. Crushed stone shall be Kentucky Department of Highways Standard Specification No. 57. Coarse sand backfill shall be spread in layers not over four inches (4") thick and thoroughly compacted. Sand may be moistened to aide compaction. Tunnels shall be backfilled in not over 3-inch layers, measured loose, with selected material suitable for mechanically tamping. If material suitable for tamping cannot be obtained, sand, gravel or crushed rock shall be blown, packed or sluiced to complete fill all void spaces.

Where local conditions permit, pavement shall not be placed until thirty days (30) have passed since placing backfill. Crushed stone is specified for roads and parking areas and sidewalks or their bases, shall be placed and compacted to the top of trench. Backfills shall be maintained easily passable to traffic at original ground level, until acceptance of project or replacement of paving or sidewalks.

Where the final surfacing is to be crushed stone, compacted earth backfill may be used in the trench to within six inches (6") of the top as shown in the Standard Details.

The Kentucky Transportation Cabinet requires that water and sewer lines—when placed within the limits of the roadway embankment and/or beneath the roadway itself—be backfilled with sand, limestone sand (11's or smaller), or "flowable fill" as defined by Section 601.03.03.B(5) of their "Standard Specifications for Road and Bridge Construction". The Cabinet typically requires that sand, limestone sand, or flowable fill be used to backfill the trench and/or bore pit up to the subgrade elevation and extending to the outside edge of the shoulder.

Railroad Company and Highway Department requirements in regard to backfilling will take precedence over the above general specification where they are involved.

The Contractor shall protect all sewer, gas, electric, telephone, water and drain pipes or conduits, power and telephone poles and guy wires from danger of damage while pipelines are being constructed and backfilled, or from danger due to settlement of his backfill.

In case of damage to any such existing structures, repair and restoration shall be made at once and backfill shall not be replaced until this is done. In all cases, restoration and repair shall be such that the damaged structure will be in as good condition and serve its purpose as completely as before uncovering and such restoration and repair shall be done without extra charge.

No extra charge shall be made for backfilling of any kind, except as provided in the Bid. Backfilling shall be included as a part of the unit price bid for which it is subsidiary. No extra charge shall be made for supplying outside materials for backfill.

Before completion of contract, all backfills shall be reshaped, holes filled and surplus material hauled away, and all permanent walks, street, driveway and highway paving, and sod, replaced and reseeding performed.

The line Contractor shall be responsible for clean-up, grading, seeding, sodding or otherwise restoring all areas that he disturbs.

Any deficiency in the quantity of material for backfilling the trenches or for filling depressions caused by settlement, shall be supplied by the Contractor.

3.9 TIE-INS TO EXISTING PIPELINES

This work shall consist of connecting new water pipes to the existing system where shown on the plans and shall include the necessary fittings, tapping sleeves, valves and necessary equipment and material required to complete the connection.

Knowledge of pipe sizes in the existing system may not be accurate, therefore, it is recommended that the Contractor check outside diameters of existing pipe and types of pipe prior to ordering the required accessories. No additional payment will be allowed for matching pipe and/or accessories when the proper size is not ordered.

Neither the Owner nor the Engineer can guarantee the location of the existing lines. The Contractor shall verify the location of all existing water mains and valves pertaining to the proposed improvements before excavation is started.

The necessary regulation or operation of the valves on existing mains, to allow for the connections being made, shall be supervised by the Engineer. Before shutting down an existing water main or branch main for a proposed connection, prior approval for a specific time and time interval shall be obtained from a representative of the Owner. At no time shall an existing main be shut down without the Owner's knowledge and permission.

Excavation to existing water mains shall be carefully made, care being exercised not to damage the pipe. The excavation shall not be of excessive size or depth beneath the pipe. The sides of the excavation shall be as nearly vertical as possible.

The Contractor shall be responsible for any damage to the existing system and any such damage shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

The Contractor shall verify, by field inspection, the necessary sizes, lengths and the types of fittings needed for each inter-connection. Typical connections are shown on the plans and any modifications or changes shall be subject to the approval of the Engineer. The exact length of the proposed water main needed for this work shall also be determined by field measurement as required.

The probing required to locate existing mains is not a separate pay item.

3.10 PIPE ENTERING STRUCTURES

Ductile iron, steel or PVC pressure pipe, four-inch (4") diameter or larger, entering structure below original earth level, unsupported by original earth for a distance of more than six feet (6'), shall be supported by #57 crushed stone. Costs for the support shall be included in the unit price for the pipe.

3.11 OWNERSHIP OF OLD MATERIALS

All fittings, valves, hydrants and other appurtenances that are removed as a result of new construction shall be removed by the Contractor but shall become the property of the Owner. All such items shall be delivered to a point by the Contractor. Said point shall be on the Owner's property and shall be designated by the Engineer.

3.12 THRUST BLOCKS AND ANCHORAGE

Thrust blocks shall be installed whenever the pipe line changes direction, as at tees, bends, crosses, stops, as at a dead end; or at valves. The locations of thrust blocks depend on the direction of thrust and type of fitting. Their size and type depends on pressure, pipe size, kind of soil, and the type of fitting. Where thrusts act upward (as at vertical curves) the weight of the pipe, the water in the pipe and the weight of the soil over the pipe should be determined to make certain that the total weight is sufficient to resist upward movement. If there is not enough soil or if it will not compact over the pipe or it is too soft to resist movement, then ballast or concrete may be placed around the pipe in sufficient weight and volume to counteract the thrust. Where a fitting is used to make a vertical bend, the fitting may be anchored to a concrete thrust block designed to key in to undisturbed soil and to have enough weight to resist upward and outward thrust, since the newplaced backfill may not have sufficient holding power.

Thrust blocks shall be constructed of not less than Class B concrete conforming to KTC Specification 601 and placed between the fitting and the trench wall. It is important to place the concrete so it extends to undisturbed (freshly cut) trench wall.

3.13 MAINTENANCE OF FLOW OF DRAINS AND SEWERS

Adequate provision shall be made for the flow of sewers, drains and water courses encountered during construction. Any structures which are disturbed shall be satisfactorily restored by the Contractor.

3.14 INTERRUPTION OF UTILITY SERVICES

No valve, switch or other control on any existing utility system shall be operated for any purpose by the Contractor without approval of the Engineer and the Utility. All consumers affected by such operations shall be notified by the Contractor as directed by the Engineer and utility before the operation and advised of the probable time when service will be restored.

3.15 FENCING

Where water supply line is being constructed in fields where stock is being grazed, Contractor shall provide temporary fence as approved by the Engineer around open trenches to prevent stock from falling in trenches. Where trenching operations should isolate grazing stock from their source of water, Contractor will either provide temporary bridging over trench or else provide water for such stock.

Where trench crosses near sound existing corner posts and existing fence is in good condition, fence may be taken loose, rolled back and stored until pipe line is completed at this point, then replaced by stretching tightly and thoroughly stapling. Additional posts will be provided and additional new fence shall be provided when it is necessary to place the fence crossed by the water line in a condition equal to existing fence before water line was constructed.

Where it is necessary to cut existing fence, new end posts shall be installed on each side of the water line and the old fence thoroughly stapled to these new posts before cutting. After pipe line is completed at this point, a new fence of galvanized wire (No. 9 gauge with No. 11 filler wires) shall be stretched between these new end posts and thoroughly stapled to existing posts and any new intermediate posts necessary to provide a good fence. Replacement of fences shall be on a replacement in-kind basis, and shall be considered incidental to laying of the lines and any additional cost shall be included in the unit price bid per lineal foot of pipe.

3.16 PROTECTION OF ADJACENT LANDSCAPE

Reasonable care shall be taken during construction of the water lines to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing.

In the course of construction, the Contractor may deflect horizontal alignment of the water line to avoid trees and to keep from damaging their roots. The Contractor shall be fully responsible for settling all claims by private property owners concerning damage to trees and shrubs.

3.17 COORDINATION WITH UTILITIES

Prior to construction, the Contractor shall arrange to meet with representatives of all utilities, and provide them with his anticipated work schedule. The Contractor shall have the utilities make their best determination of utility locations in the areas in which he is working. Throughout the progress of the work, such field markings of utilities shall be kept current.

Repairs to any utilities damaged by the Contractor shall normally be performed by the utility at the Contractor's expense, unless the Contractor and the utility negotiate other understandings and/or procedures.

3.18 BLASTING AND ROCK EXCAVATION

The Contractor shall make his own investigation as he deems necessary to ascertain the sub-surface conditions to be encountered in the work.

All blasting operations shall be conducted in accordance with municipal ordinances, state and federal laws and Section 9, Explosives, of the "Manual of Accident Prevention in Construction", published by the Associated General Contractors of America, Inc. Soil particle velocity shall not exceed limit set by Kentucky law. All explosives shall be stored in conformity with said ordinances, laws and safety regulations. No blasting shall be done within five feet of any water mains, sewer lines, natural or manufactured gas lines, liquid petroleum product lines or other utilities. Any damage done by blasting is the responsibility of the Contractor and shall be promptly and satisfactorily repaired by him.

The Contractor shall use delay caps or other approved methods to reduce earth vibrations and noise. Mud capping, as defined in the above manual, will not be permitted as a method of breaking boulders. No blasting shall be permitted on Sundays or after dark.

Prior to commencing with the work, the Contractor shall, during a preconstruction conference with the Owner and the Engineer, state clearly his approach to performing the excavations on the project. He shall be familiar with the laws and ordinances covering blasting and shall also give consideration to the use of hydraulically operated rock breaking devices in lieu of blasting where considered necessary. If blasting is not handled in an expert manner at all times, the Engineer reserves the right to suspend blasting and require the work to proceed without it.

Prior to blasting, the Contractor shall make his own detailed preblast survey of adjacent walks, curbs, retaining walls, house foundations, etc. to determine conditions prior to the work. Such a file of information, including photographs, may be certified in such a manner as the Contractor believes necessary since this information that may stand in his defense.

3.19 TESTING AND CLEANING

As sections of the new main are completed the pipe shall be thoroughly cleaned by forcing a "Pig" type cleaner through the pipe a sufficient number of times to remove all matter inside the pipe that has accumulated during construction. A minimum of two "Pig" runs will be required.

The force main and appurtenances, as rapidly as valves are installed, shall be tested to the pressure rating of the pipe, or as directed by the Engineer, at point of maximum pressure. Defective joints of pipe shall be cut out and replaced as directed by the Engineer. Cracked or defective pipe fittings, valves or hydrants

disclosed in the pressure test shall be replaced by the Contractor with sound material, and the test shall be repeated until the test results are satisfactory to the Engineer.

The test pressure shall not be less than 1.25 times the working pressure at the highest point along the test section and the hydrostatic test shall be of at least a two (2) hour duration. The test pressure shall not vary by more than ±5 psi for the duration of the test.

3.19.1 Pressurization. After the pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure of at least 1.5 times the section of pipe shall be slowly filled with water, and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Owner. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure.

3.19.2 Air Removal. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Owner.

3.19.3 Leakage Defined. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled.

Leakage shall not be measured by a drop in pressure in a test section over a period of time.

3.19.4 Allowable Leakage. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\,(SQ.\ ROOT\ (P))}{133{,}200}$$

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 pound per square inch (gauge)

This formula is based on an allowable leakage of 11.65 gpd/mi/in. of nominal diameter at a pressure of 150 psi.

All leaks shall be repaired whenever or wherever there is evidence of a leak. Water used by the Contractor shall be paid for by the Contractor at the rate charged by the local water company.

3.20 WARRANTY

The normal one year warranty shall be provided by the Contractor as stipulated in the General Conditions. In the event a problem involves defective materials, the Owner will enjoin the Contractor in the resolution of the problem.

3.21 SETTLEMENT OF QUANTITIES

When the project is complete, a settlement of quantities will be accomplished. All left-over material quantities will be the property of the Owner. Pipe quantities will be considered only in full pipe lengths. The difference in the inventory of remaining pipe and installed quantities shall be considered waste incidental to the installation. The Contractor shall compensate the Owner for the cost of this wasted quantity based on the delivered invoice prices.

4.0 PAYMENT

The unit prices bid for force mains shall constitute full payment for furnishing and installing such lines, including all work as specified hereinabove. The distance shall be precisely measured as work progresses.

In making monthly payment estimates, failure of the contractor to provide continuous and orderly clean-up, periodic testing and orderly "as-built" records shall reduce "work-in-place" computations by ten percent (10%).

SECTION 15121

FORCE MAIN APPURTENANCES

1.0 GENERAL

Provide all labor, materials, equipment and services required for furnishing and installing appurtenances specified herein.

2.0 MATERIALS

2.1 GATE VALVES

Gate valves, 3" and larger, for fabricated pipe systems shall be resilient sealed, iron body, flanged, fully bronze mounted, and suitable for working water pressures of not less than 250 PSIG. Valves shall be of standard manufacture and of the highest quality both of materials and workmanship and shall conform to the latest revision of AWWA Specification C509. Unless otherwise shown on the plans, all gate valves shall be non rising stem. Valves shall be rated for a working pressure of not less than 250 psi and shall have flanges drilled 125 lbs. pattern. Unless otherwise shown on the Drawings, valves and valves in basins shall be hand wheel operated.

2.2 SANITARY AIR/VACUUM VALVE ASSEMBLY

Valves shall be 2-inch full opening ARI64D-0252T nylon air valve or approved equal with a full five year warranty.

The valves shall have a conical body shape, spring loaded float and seal plug connection to ensure no contact between the sewage and the seal. The lower body shall be funnel shaped. The deal plug assembly shall be made from light weight non-corroding reinforced nylon. Internal metal parts shall be made of corrosion resistant stainless steel. The float shall be made of plastic materials.

2.3 VALVE BOXES

Valve boxes shall be of 5-1/4 inch standard cast iron, two-piece, screw type valve box with drop cover marked "SEWER". Valve boxes shall be accurately centered over valve operating nut, and backfill thoroughly tamped about them. Valve box bases shall not rest on the valves but shall be supported on crushed stone fill. They shall be set vertically and properly cut and/or adjusted so that the tops of boxes will be at grade in any paving, walk or road surface, and 2 to 3 inches above ground in grass plots, fields, woods or other open terrain. In grass

areas, provide concrete pad around valve box; slightly crown in all directions to shed water.

2.4 IN-LINE CLEANOUT

In-line cleanout shall include the complete assembly of 3-inch PVC SDR-21 pipe and fittings from the main to a 3-inch m.j. x flange gate valve with adjustable valve box, 3-inch ductile iron flanged pipe from the gate valve to the hose nozzle, hose nozzles with caps and chains. Two gate valves sized to the force main with an adjustable valve box shall be included in the bid price for cleanouts. The manhole shall be 18-inch HDPE, Model N-12 manufactured by Advanced Drainage Systems, or approved equivalent. The solid lid and frame shall be Model R-5900C manufactured by Neenah, or approved equivalent.

2.5 END-LINE CLEANOUT

End-line cleanouts shall include 3-inch PVC SDR-21 pipe and fittings from the main to a single 3-inch m.j. x flanged gate valve with adjustable valve box, 3-inch ductile iron flanged pipe from gate valve to the hose nozzle, hose nozzle with cap and chain. A gate valve sized to the force main shall be included in the bid price for cleanouts. The manhole shall be 18-inch HDPE, Model N-12 manufactured by Advanced Drainage Systems, or approved equivalent. The solid frame and lid shall be Model R-5900C manufactured by Neenah, or approved equivalent.

3.0 PAYMENT

Payment for force main appurtenances shall be included in the work to which it is subsidiary and no separate payment will be made unless otherwise noted on the Bid Schedule. Payment shall include the costs for transporting, storing, trenching, bedding, installation, thrust blocking, testing, backfilling, disinfection, tie-ins to structures or other pipes, and all other incidental items not specifically called out.

SECTION 15123

FREE BORE

1.0 GENERAL

Under this item, the Contractor shall provide all labor, tools, equipment and materials to install the free bore at all bituminous and concrete driveways and/or county road unless otherwise directed by the Engineer.

2.0 MATERIALS

This section is not applicable.

3.0 EXECUTION

The Contractor shall provide a jacking pit and bore through the earth at the proper line and grade. The augured hole shall be as small as practical to allow the carrier pipe to pass through.

This bid item does not apply to service tubing.

4.0 PAYMENT

The unit price bid per linear foot for free boring, as measured from edge of pavement to edge of pavement, regardless of size of bore, shall constitute full compensation for the work specified.

SECTION 15126

SEWER TIE-INS

1.0 GENERAL

The Contractor shall provide all labor, materials, tools and equipment to tie-in the new sewer lines to pump stations, force mains, etc.

2.0 MATERIALS

Not applicable.

3.0 EXECUTION

3.1 TIE-IN TO FORCE MAIN

The Contractor shall connect new force mains, as indicated on the plans, to the existing force main. The connection shall be done with appropriate fittings. The Contractor shall seal the end of any abandoned force mains as part of the tie-in.

3.2 TIE-IN TO PUMP STATION

The Contractor shall connect any gravity sewer or force main, as indicated on the plans, to a pump station. The Contractor shall meet the specifications in Section 3.1 for force mains entering or existing a pump station. No sewage shall be allowed to escape from the sewer system

3.3 CUT AND CAP

The Contractor shall cut all abandoned lines from existing force mains as indicated on the plans. The cut and cap shall be installed in a way to prevent sewage from escaping from the sewer system

4.0 PAYMENT

Payment for sewer line tie-ins shall not apply unless indicated on the plans. Payment for sewer line tie-ins shall only occur when a new sewer line connects to an existing sewer line, manhole, or wet well.

The Contractor shall be paid the unit bid price for supplying all labor, materials, and equipment to connect a new line to an existing sewer line.

DIVISION 16: ELECTRICAL

SECTION 16020

PUMPING STATION ELECTRICAL

1.0 GENERAL

1.1 SCOPE OF WORK

A. Provide all labor, material, tools, approvals, utility connection fees, excavation, backfill, and other services and equipment necessary to install the electrical system as shown on the Contract Drawings and as specified herein.

B. Each Contractor bidding on the work included in these Specifications shall view the building site and carefully examine the contract Drawings and Specifications, so that he/she may fully understand what is to be done, and to document existing conditions.

1.2 RELATED WORK

A. Contractors bidding work under this Contract shall read and understand Division Zero and Division 1 - General Requirements. If any discrepancies are discovered between this Division and the General Requirements, the above-mentioned documents shall overrule this section.

B. Section 16900 – Control Panel

C. Section 17010 – Instrumentation/SCADA

1.3 SUBMITTALS

A. Provide shop drawings including descriptive literature and/or installation, operation and maintenance instructions. Shop drawings shall be submitted for all equipment proposed to be furnished under this Division.

B. Electrical submittals shall be submitted after the pumping/process equipment has been approved. Otherwise the Contractor is responsible for any changes and costs incurred as a result of changes necessary to the electrical equipment.

C. Shop Drawings shall be clearly marked and or highlighted as to which product, type, option, etc. is being submitted.

D. Where wiring diagrams are not shown on the Contract Drawings, they are to be provided by the supplier of the equipment served.

1.4 SYMBOLS AND ABBREVIATIONS

A. The symbols and abbreviations generally follow standard electrical practice, however, exceptions to this shall be as shown on the Contract Drawings.

1.5 COORDINATION WITH OTHER TRADES

A. The Contractor shall coordinate the electrical work with that of other trades to ensure proper final location of all electrical equipment and/or connections.

1.6 CODES

A. Comply with the latest revision of the following codes:

1.	Kentucky Building Code	KBC
2.	National Electrical Code	NEC
3.	National Electrical Safety Code	NESC
4.	Underwriters Laboratories, Inc.	UL
5.	National Fire Protection Association	NFPA
6.	National Electrical Manufacturers Association	NEMA
7.	Occupational Safety and Health Administration	OSHA
8.	Insulated Cable Engineers Association	ICEA
9.	Instrument Society of America	ISA
10.	American National Standards Institute, Inc.	ANSI
11.	Anti-Friction Bearing Manufacturers Association, Inc.	AFBMA
12.	Federal Communications Commission	FCC

B. Comply with any other applicable federal, state, or local laws and ordinances.

C. Where the Engineer's design requires a higher standard than the applicable code, the Engineer's design shall be followed.

1.7 INSPECTIONS AND PERMITS

A. Inspection of the electrical system on all construction projects is required. If the local government has appointed a state licensed inspector, the Contractor shall be required to use that person to perform the inspections. If a locally mandated inspector does not exist, the Contractor shall select and hire a state licensed inspector, who has jurisdiction before any work is concealed.

B. At the time of completion of the project, there shall be furnished to the

Owner and Engineer a certificate of compliance, from the agency having jurisdiction pursuant to all electrical work performed.

C. All permits necessary for the complete electrical system shall be obtained by the Contractor from the authorities governing such work.

1.8 STORAGE

A. All work, equipment, and materials shall be protected against dirt, water, or other injury during the period of construction. Complete replacement with new equipment is required for any damaged materials.

B. Sensitive electrical equipment such as motor starters, controls, transmitters, etc., delivered to the jobsite, shall be protected against injury or corrosion due to atmospheric conditions or physical damage by other means. Protection is interpreted to mean that equipment shall be stored under roof, in a structure properly heated in cold weather and ventilated in hot weather. Provision shall be made to control the humidity in the storage are at 50 percent relative. The stored equipment shall be inspected periodically, and if it is found that the protection is inadequate, further protective measures shall be employed.

1.9 MATERIALS

A. All materials used shall be new and at least meeting the minimum standards as established by the NEC and/or National Electrical Manufacturers Association. All materials shall be UL listed for the application where a listing exists. All equipment shall meet applicable FCC requirements and restrictions.

B. The material and equipment described herein has been specified according to a particular trade name or make to set quality standards. However, each Contractor has the right to substitute other material and equipment in lieu of that specified, other than those specifically mentioned at matching or for standardization, providing such material and equipment meets all of the requirements of those specified and is accepted, in writing by the Engineer.

C. The reuse of salvaged electrical equipment and/or wiring will not be permitted unless specified herein or indicated on the Contract Drawings.

D. All salvaged or abandoned electrical materials shall become the property of the Contractor and shall be removed from the job site upon completion of the project, unless otherwise noted on the Contract Drawings or specified herein.

1.10 ERRORS, CORRECTIONS, AND/OR OMISSIONS

A. Should a piece of utilization equipment be supplied of a different size or horsepower than shown on the Contract Drawings, the Contractor shall be responsible for installing the proper size wiring, conduit, starters, circuit breakers, etc., for proper operation of that unit and the complete electrical system at no extra cost to the Owner.

B. It is the intent of these Specifications to provide for an electrical system installation complete in every respect, to operate in the manner and under conditions as shown in these Specifications and on the Contract Drawings. The Contractor shall notify the Engineer, in writing, of any omission or error at least 10 days prior to opening of bids. In the event of the Contractors failure to give such notice, he/she may be required to correct work and/or furnish items omitted without additional cost.

C. Necessary changes or revisions in electrical work to meet any code or power company requirement shall be made by the Contractor without additional charge.

1.11 GUARANTEES AND WARRANTIES

A. The Contractor shall guarantee all work including equipment, materials, and workmanship. This guarantee shall be against all defects of any of the above and shall run for a period of 1 year from the date of acceptance of the work, concurrent with the one year guarantee period designated for the general construction contract under which electrical work is performed.

B. Repair and maintenance for the guarantee period is the responsibility of the Contractor and shall include all repairs and maintenance other than that which is considered as routine. (That is oiling, greasing, etc.) The Engineer shall be the judge of what shall be considered as routine maintenance.

1.12 TESTING

A. After the wiring system is complete, and at such time as the Engineer may direct, the Contractor shall conduct an operating test for acceptance. The equipment shall be demonstrated to operate in accordance with the requirements of these Specifications and the Contract Drawings. The test shall be performed in the presence of the Engineer or his authorized representative. The Contractor shall furnish all instruments and personnel required for the tests.

B. Before energizing the system, the Contractor shall check all connections and set all relays and instruments for proper operation. He shall obtain all necessary clearances, approvals, and instructions from the serving utility company prior to placing power on the equipment.

1.13 CLEANUP

A. Cleanup shall be performed as soon as possible after the electrical installation is complete. All control panels, switches, etc., shall be free from tags, stickers, etc. All painted enclosures shall be free from scratches or splattered paint. The interior of all enclosures shall be clean from dust, wire strippings, etc. Surplus material, rubbish, and equipment shall be removed from the jobsite upon completion of the work.

B. During construction, cover all Owner equipment subject to damage.

1.14 EXCAVATION AND BACKFILL

A. Excavation for conduits shall be of sufficient width to allow for proper jointing and alignment of the type conduit used. Conduit shall be bedded on original ground unless indicated otherwise on the Drawings. Where conduit is in solid rock, a 6 inch earth cushion must be provided. Conduit shall be laid in straight lines between pull boxes and/or structures unless otherwise notes on the Contract Drawings. The cost of solid rock excavation shall be included in the lump sum bid.

B. Backfill shall be hand placed, loose granular earth for a height of 6 inches above the top of the largest conduit. This material shall be free of rocks over ½ inches in diameter. Above this, rocks up to 3" diameter may be included but must be mixed with sufficient earth to fill all voids.

1.15 POWER COMPANY COORDINATION

A. The Contractor is responsible for coordinating all activities onsite by the power company.

B. The Contractor is required to meet all requirements and special provisions of the power company. The Contractor shall coordinate with the utility prior to bidding the project. No extras will be allowed for provisions required by the power company.

1.16 TEMPORARY ELECTRICAL POWER

A. The Contractor shall be responsible for providing temporary electrical power as required during the course of construction and shall remove the temporary service equipment when no longer required.

1.17 OVERCURRENT PROTECTION

A. Circuit breakers or fused switches shall be the size and type as written herein and shown on the Contract Drawings. Any additional overcurrent protection required to maintain an equipment listing by an authority having jurisdiction shall be installed by the Contractor at no extra cost to the Owner.

1.18 TRAINING

A. Provide onsite training on major items of equipment. The training shall be conducted by a qualified representative of the manufacturer, and shall be sufficient in content and length such that the Owner's personnel are fully qualified to operate, maintain, and troubleshoot the equipment. O&M manuals must be approved before training can commence. Only one training class is required for each item of equipment. Coordinate the time/date with the Owner.

B. An official training report shall be submitted to the Engineer. It shall be signed by Owner's personnel.

1.19 RECORD DRAWINGS

A. The Contractor shall maintain 1 set of the Contract Drawings on the job in good condition for examination at all times. The Contractor's qualified representative shall enter upon these Drawings, from day to day, the actual "as-built" record of construction and/or alteration progress. Entries and notes shall be made in a neat and legible manner and these Drawings delivered to the Engineer after completion of the construction, for use in preparation of Record Drawings. Underground lines must be dimensioned to permanent structures.

1.20 MAINTAINING CONTINUOUS ELECTRICAL SYSTEM AND SERVICE

A. Existing service continuity shall be maintained at all times. In no way shall be installation and/or alteration of the electrical work interfere with or stop the normal operation of the existing facilities, except where prior arrangements have been made. Provide all equipment necessary (including temporary switchgear, controls, and rental power generation equipment if necessary) to ensure that the existing system remains operational until the new system is fully functional.

1.21 GROUNDING AND BONDING

A. All metallic conduit, cabinets, equipment, and service shall be grounded

in accordance with NEC requirements. All supporting framework in contact with electrical conduit, cable, and/or enclosures, shall be properly grounded.

1.22 CONTRACTOR LICENSING

A. The Contractor performing the electrical work on this project shall be a licensed electrical contractor in the State of Kentucky.

1.23 ELECTRICAL COMPONENT MOUNTING HEIGHTS

A. Mounting heights shall be as shown on the Contract Drawings. Operators and control devices shall not be mounted higher than 6'6" above finished floor or grade.

1.24 EQUIPMENT IDENTIFICATION

A. All starters, feeder units, disconnects, instruments, etc., shall be marked to indicate the motors, circuit, they control or monitor. Marking is to be done with engraved laminated nameplates. Nameplates shall be fastened to equipment with stainless steel screws, one each side. In no way shall be installation of the mounting screws void the NEMA enclosure rating of the equipment in which they are installed. If there are more than one number, the equipment shall be number consecutively and labeled as such. Nameplate background color shall be white, with black engraved letters.

B. Disconnect switches, control panels, transfer switches, panelboards etc. shall be labeled with orange OSHA-compliant vinyl self-adhesive signs that list the maximum voltage contained inside the cabinet or panel.

1.25 EQUIPMENT CONFIGURATION/PROGRAMMING

A. Any equipment furnished by the Contractor is required to be configured or programmed by the Contractor or his subcontractor/vendor. Any necessary studies or engineering necessary to configure or program this equipment shall be provided by the Contractor as needed to place the equipment into successful operation. Engineer or Owner will not be responsible for equipment configuration or programming.

B. If a manufacturer or manufacturer's representative is required to startup/commission the equipment in these Specfications, then it is required that the Contractor provide the services of the manufacturer to configure/program the equipment. This includes the provision of any necessary studies or engineering necessary for the configuration/programming.

2.0 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Raceways

1. Rigid Aluminum Conduit - "Allied," "Wheatland," "Indalex," or equal.
2. PVC Conduit – "Allied," "Carlon," "Cantex," or equal.
3. Liquidtight Flexible Metal Conduit – "Allied," "Anaconda," or equal.

B. Wires and Cables

1. Building Wire (Types THWN and THW) - "Collyer," "Rome," "American," "Carol," or equal.
2. Instrumentation Cables - "Eaton-Dekoron," " Manhatton," "American," "Belden," "Okonite," or equal.

C. Boxes - "Appleton," "Crouse-Hinds," "Hoffman," "Rittal," or equal.

D. Wire Connections and Connecting Devices

1. Termination and Splice Connectors - "3M Scotchlok," "Anderson," "T&B," "Burndy," or equal.
2. Connectors, Lugs, etc. - "T&B," "Anderson," "Burndy," or equal.

E. Grounding Equipment - "Cadweld," "ITT Blackburn," "Copperweld Bimetallics Group," "Cathodic Engineering Equipment Co.," or equal.

F. Motor Control Equipment - "Square D," "Allen Bradley," "Eaton Cutler-Hammer," "G.E.," or equal.

2.2 MATERIALS

A. Conduit and Fittings

1. Aluminum Conduit

a. Aluminum conduit shall be extruded from alloy 6063 and shall be the rigid type, non-toxic, corrosion resistant, and non-staining. It shall be manufactured per UL standards as well as listed/labeled by same.

b. Fittings, boxes, and accessories used in conjunction with aluminum conduit shall be die cast, copper free type. They shall be resistant to both chemical and galvanic corrosion.

All covers shall have neoprene gaskets. Aluminum fittings containing more than 0.4 percent copper are prohibited.

c. Aluminum conduit proposed for concrete slab or underground applications shall be UL listed for the purpose and factory pre-coated. Corrosion-resistant taping is allowed for stubouts out of the ground.

2. Polyvinychloride (PVC) Conduit - PVC conduit and fittings shall be Schedule 80 heavy wall and UL listed. Expansion joints shall be used as recommended by the manufacturer in published literature. PVC systems shall be 90 degrees Celsius minimum UL rated, have a tensile strength of 7,000 psi @ 73.4 degrees Fahrenheit, flexural strength of 11,000 psi and compressive strength of 8,000 psi.

3. Liquidtight Flexible Conduit - Flexible conduit shall be the metallic liquidtight type constructed from flexibly or spirally wound elecro-galvanized steel. Connections shall be by means of galvanized malleable iron squeeze type fittings. The conduit shall be light gray in color and have sealtight fittings, type UA.

4. Locknuts shall be bonding type with sharp edges for digging into the metal wall of an enclosure. Myer-style aluminum hubs shall be used rather than locknuts for all NEMA 4X and exterior penetrations.

5. Bushings shall be metallic insulating type, consisting of an insulating insert molded of locked into the metallic body of the fitting. Bushings made entirely of metal or nonmetallic material are not permitted.

6. Corrosion-Protection Tape: The corrosion protection tape shall be Scotchrap 51 or equal with 20mil thickness PVC tape and high-tack adhesive. Degreasing and priming of the conduit is required prior to applying the corrosion-protection tape.

B. Conductors (600 Volts and Below)

1. All conductors shall be insulated so that they are rated at 600 volts.

2. Insulated conductors shall be minimum #12 AWG for power or #14 AWG for control and shall be stranded.

3. All conductors brought to the job site shall be new and unused and

where no special factory cut lengths are involved, shall be delivered to the job site in standard coils. Contractor shall provide verification to the Engineer of wire condition before wire is installed.

4. All conductors shall be soft drawn, 98% conductivity copper conforming to the latest ASTM Specifications and the requirements of the National Electrical Code.

5. Conductors shall be insulated with type THWN insulation and all conduits shown on the Drawings are sized accordingly.

C. Instrumentation Cable - Instrumentation cable shall have individually shielded and twisted pairs or triads. Conductors shall be tinned copper, and the cable shall include a separate drain conductor. Voltage rating shall be 600 Volt. Conductor colors shall be black and white. Shielding shall be a combination braid/foil with 100% coverage. Insulation shall be PVC or XLPE. Conductors shall be #18AWG minimum, but no smaller than the size indicated on the Drawings. Insulation shall be polyethylene, rated for underground wet location use, and resistance at 68 degrees Fahrenheit between conductors and between conductors and ground should be at least 500 megohms per 1,000 feet.

D. Submersible pump power cables shall be of the extra hard usage type suitable for submerged duty and able to withstand common corrosive agents found in water and wastewater. They shall be provided with high grade non-magnetic stainless steel strain relief cable grips installed at the pump end and high grade non-magnetic stainless steel support cable grips anchored to the wet well structure where they enter the wetwell. The support grips shall be the heavy-duty type stainless 302, 304, or 316 as manufactured by Hubbell/Bryant or equal.

E. Boxes and Enclosures

1. Junction boxes for outdoors surface mounting shall be stainless NEMA 4X type 316, with at least 5 ½ full threads for each conduit opening, and shall be suitable for surface mounting as required with drilled external, cast mounting extensions. Box covers shall be hinged or cap screw retained as required, of the same material as the box and provided with stainless steel hardware.

F. Wire Connections and Connecting Devices

1. Terminals and spice connectors from #22 to #4 AWG shall be compression type with barrels to provide maximum conductor contact and tensile strength. Performance, construction, and

materials shall be in conformance with UL standards for wire connectors and rated for 600 Volts and 105 degrees Celsius.

2. Lugs and splice connectors from #6 AWG to 1000 kcmil shall be compression types with barrels to provide maximum conductor contact and tensile strength. They shall be manufactured from high conductivity copper and entirely tin plated. They shall be crimped with standard industry tooling. The lugs and connectors must have a current carrying capacity equal to the conductors for which they are rated and must also meet all UL requirements. All lugs above #4/0 shall be 2 hole lugs with NEMA spacing. The lugs shall be rated for operation through 35 KV. The lugs shall be of closed end construction to exclude moisture migration into the cable conductor.

G. Wiring Devices

1. General – All receptacles shall be heavy duty specification grade duplex receptacle, Nema 5-20R, 20A, 125V, 3-wire. Provide weatherproof cover where indicated on the Drawings.

2. Duplex outlet (interior) - "Hubbell" catalog series 5362, or equal.

3. Ground fault interrupting receptacles shall be required where shown on the Contract Drawings, and shall be indicated by the abbreviation "GFI" beside the circuit symbol on the Contract Drawings. They shall be rated 20 amps (125 volts) and shall be of the duplex, feed through type, capable of protecting all downstream receptacles on the same circuit. They shall be UL listed and shall comply with UL 943 and interrupt the current between 4-6 milliamps of ground fault leakage. Appropriate plates shall be furnished and installed. The 20 ampere rating shall apply not only to device internals but to the faceplate as well. Receptacle shall be Hubbell GFI 5352, or equal.

4. Weatherproof covers shall be Hubbell WP series, Thomas and Betts 2CKG, or equal. They shall be weatherproof-in-use with cast aluminum construction. Mounting screws shall be stainless. Protection shall be Nema 3R.

5. General – Switches shall be industrial grades, 120/227VAC, 20A

   a. Single pole (exterior) - "Hubbell" cat. no. 1222-gray, or equal.

b. Weatherproof switch covers shall be Hubbell 7420 series, or equal, with stainless mounting screws, cast aluminum construction and wet location rating.

H. Panelboards

1. Shall be UL listed with copper bussing.
2. Enclosure shall be NEMA 1
3. Circuit breakers shall be bolt-in.
4. Panelboards rated for 120/240V service shall have an interrupting capacity of not less than 10,000A, RMS symmetrical.
5. Panelboards rated for 480V service shall have an interrupting capacity of not less than 14,000A, RMS symmetrical.
6. Panelboards shall have an integral TVSS surge suppressor where indicated on Drawings.

I. Motors

1. See Division 11 for requirements.

J. Surge Protection Devices

1. Panelboard SPD/TVSS:

A. The TVSS shall be suitable for application in category C3 environments as described in ANSI/IEEE C62.41. The TVSS shall be of parallel design and provide protection, line to ground, neutral to ground, and line to neutral for wye or delta distribution systems. The TVSS shall be compatible with the indicated electrical system, voltage, current and distribution configuration.

B. TVSS shall comply with ANSI/IEEE C62.1, C62.41, and C62.45. The TVSS shall be capable of surviving 1,000 sequential category C3 surges without failure following IEEE test procedures established in C62.45.

C. The TVSS shall have LED indicators that provide indication of suppression failure. It shall also have a surge counter. It shall also have a relay contact that provides remote indication of surge protection failure.

D. The TVSS maximum continuous operating voltage (MCOV) shall be capable of sustaining 110 percent of the nominal RMS voltage continuously without degradation.

E. TVSS shall have surge current capacity of 40,000 amps minimum per mode with a response time no greater than 5 nanoseconds, for any of the individual protection modes, under laboratory conditions with optimum lead lengths.

F. The TVSS UL 1449 surge suppression rating for any suppression mode shall not exceed:

Electrical System Voltage	Phases	UL 1449 Surge Suppression Ratings
120/240	1	330V
120/240	3	330V
120/208	3	330V
208	3	700V
277/480	3	700V
480	3	1500V

K. Safety Switches

1. All safety switches shall be heavy-duty load break type with a quick-make, quick-break, switch mechanism. The switches shall be fused or unfused as indicated on the Drawings. The handle position shall give visual indication of open and closed switch position. Padlocking capability shall be provided for locking the switch in the "OFF" (open) position.

2. The switch jaws shall be multi-spring type for positive grip of the switch blades and shall be provided with arc suppressors. The fuse clips shall be spring reinforced, positive pressure type of electrolytic copper. Fuse clips shall be rejection type.

3. The switch shall be provided with cover-blade interlock so that the cover cannot be opened when the switch blades are closed, nor can the switch blades be closed with the cover open. Interlock bypassing devices shall be included for use by authorized personnel. Note: where indicated, safety switches shall have integral electrical interlocks. Contacts shall be open when the switch is in the off position.

4. Enclosures shall be NEMA 1 where used inside the building and NEMA 4X stainless steel where used outside unless otherwise shown on the Drawings.

5. Each safety switch shall be provided with ground lugs as required to accept grounding conductors as shown on the Drawings. The

grounding lugs shall be factory installed and shall have direct metal-to-metal contact with the switch enclosure.

6. Double throw fused safety switches shall be furnished where indicated. They shall be lockable in any position and shall be service-entrance rated. They shall be heavy-duty NEMA 4X stainless steel unless noted otherwise.

L. Portable Generator Receptacle

1. Generator receptacle shall be Crouse-Hinds Arktite series, Killark, or equal. Shall be UL1682 and 514 compliant.

2. Provide a heavy-duty, surface mounted generator receptacle with back box and all accessories. Provide the rating indicated on the Drawings. Sizes through 200A shall be load-break type.

3. The generator receptacle shall be the "Style 2" metallic type with factory installed jumper to bond the metallic housing to the grounded conductor.

4. The generator receptacle shall have reversed contacts such that personnel will not be exposed to live voltage even if the generator is running.

5. The receptacle shall be a 4-wire, 4-pole model.

6. The receptacle shall be NEMA 4 weatherproof with a cap for protection while not in use.

M. Motor Control – See Section 16900 for requirements.

N. Supporting Devices – All strut, channel, conduit clamps/straps, and other supporting devices shall be either stainless steel or aluminum. All hardware such as nuts, bolts, anchors, washers, etc. shall be stainless steel.

O. Magnetic Flow Meter – See Division 11 for requirements.

P. Level Transmitter:

1. Sensor shall be submersible type, 316L SS, with a stainless steel diaphragm and a ceramic measuring cell that is resistant to overload, alternating loads, and aggressive media.

2. The sensor shall be designed for level measurement of water or wastewater
3. The sensor shall be a two-wire device that provides a 4-20mADC output.
4. The sensor shall be loop-powered from 12-30VDC.
5. All electronics shall be completely potted with compound to protect from moisture damage.
6. The support cable shall have a hard-wearing conical seal of the probe tube and climactic protection in the pressure compensation tube.
7. The unit shall have a range as indicated on the Contract drawings.
8. The sensor accuracy shall be 0.5% of full scale, minimum.
9. A mounting clamp and NEMA 4X junction box shall be furnished with the sensor for field installation. The cable shall be of a length sufficient to meet the requirements of the Contract drawings.
10. The sensor range shall be as indicated on the Contract drawings. It is required to be installed in a stilling well.
11. The sensor shall be Endress-Hauser Water-Pilot, or equal.

3.0 EXECUTION

3.1 INSTALLATION/APPLICATION/ERECTION

A. Conduit

1. PVC conduit shall be utilized below grade, and aluminum conduit shall be used above grade. The transition from PVC to aluminum shall occur below grade prior to the elbow. The aluminum conduit shall be taped with corrosion-prevention tape from the transition point to 6" above finished grade.
2. The Contractor shall be responsible for setting of all sleeves for his work. Passage of conduit through masonry and concrete walls shall be provided with steel pipe sleeves. Sleeves shall be flush with each face of the wall. Seal space between sleeve and conduit with oakum and waterproof mastic.
3. All conduit 1-1/4 inches and larger shall be sleeved.
4. Concrete encasements – not required on this project.
5. During construction, all new conduits shall be kept dry and free of moisture and debris. Before the wire is pulled in, all conduits shall be swabbed to clear all moisture and debris which may have unavoidably accumulated.
6. Rigid conduits, where they entered panelboards, cabinets, pull boxes or outlet boxes shall be secured in place by galvanized, double locknuts (one inside and one outside) and bushings. Conduit bushings shall have insulating material which has been permanently fastened to the fittings. Bushings for conduit 1-1/2

inches trade size and larger shall be complete with grounding lug and shall be bonded to the box by means of bare copper wire. Myers hubs shall be utilized rather than locknuts for all exterior and NEMA 4X penetrations.

7. All field bends shall be made with standard tools and bending equipment manufactured especially for this purpose. Bends in metallic conduit shall be made while cold and in no case shall the conduits be heated. Conduits shall not be bent through more than 90 degrees.
8. Size of conduits shall not be less than that required by the National Electrical Code. The Contractor shall install larger size conduits than detailed where there is more than 100 feet of unbroken run or where the total of the angles through which the conduit has been bent during a single run exceeds 270 degrees.
9. In general, flexible conduit is prohibited. Where absolutely necessary, it shall be liquidtight, with maximum lengths of 3 feet.
10. All conduit joints shall be made up tight and no running threads shall be permitted on threaded connections. No kinked, clogged or deformed conduits shall be permitted on the job.
11. During construction, all installed conduits shall be temporarily capped or corked.
12. All moisture proofing or other material for thread protection shall be removed from conduit threads prior to installation. No material of insulating quality shall be used on the conduit threads or other places which will reduce the overall conductivity of the conduit system.
13. Raceways shall be securely and rigidly fastened in place with conduit clamps or approved conduit hangers. Bolts, screws, etc. used in securing the work shall be stainless steel and of ample size for the service. Assembly bolts, nuts, washers, etc., shall be stainless steel. Raceways shall NOT be welded to steel structures.
14. Horizontal and vertical conduit runs shall be supported by one hole straps with clamp backs, special brackets, or other approved devices with suitable bolts, expansion shields where required. All mounting hardware shall be stainless steel.
15. The use of perforated iron straps or wire for supporting conduits will not be permitted.
16. Where conduit is run in a concrete slab, the conduit shall be installed as close to the middle of the concrete slabs as practicable without disturbing the reinforcement. The outside diameter shall not exceed one-third of the slab thickness and conduits shall be placed not closer than three diameters on centers, except at cabinet locations where the slab thickness shall be increased upon consultation with and approval by the Engineer.

17. Depth of bury for all conduit shall be as indicated but not less than 30 inches below finished grade.
18. All conduit shall have an insulated ground wire pulled to all equipment.
19. All conduits penetrating enclosures shall have duct seal applied to seal the conduit and prevent moisture from entering the enclosure.

B. Wire and Cable (600 Volts and Below):

1. All wiring shall be installed in conduit. Wire shall not be installed until all work of any nature that may cause injury to the wire is completed.
2. Mechanical means shall not be used in pulling in wires No. 8 or smaller.
3. Approved wire pulling lubricant shall be used as required to prevent insulation damage and over stressing of the wire while pulling through conduit. In no case shall conductors be greased or coated with any substance injurious to the conductor insulation or sheath.
4. All wiring in control equipment, cabinets, etc., shall be neatly wrapped, taped, or laced into groups to provide a neat and orderly appearance in the equipment.
5. Where the wire is shown larger than that required for the load, it is done so for voltage drop or other purposes and must be installed as shown. Where the wire is stranded, the removal of strands in order to install the wire into a lug provided on any equipment will not be permitted. A larger lug shall be installed which will accept the wire size indicated.
6. For the wiring of circuits consisting of AWG No. 10 or smaller wire, self-insulated pressure connectors (wirenuts) shall be utilized for all splices or joints.
7. Where indicated on the Drawings, cables entering enclosures shall be sealed using strain relief connectors suitable for Class I, Division 1, Group D hazardous locations. The purpose of the connector is to provide a seal between the hazardous and non-hazardous location without the use of sealing fittings.
8. Each wire shall be labeled at both termination points. Individual conductor or circuit identification shall be carried throughout, with circuit numbers or other identification clearly stamped on terminal strips and shown in wiring diagrams.
9. In all junction boxes, cabinets, control compartments and terminal boxes where no terminal board is provided, each wire, including all power wires, shall be properly identified by plastic coated, self-adhesive, wire marker.
10. In cases similar to the above where the terminal boards are provided for the control, indicating, and metering wires, all wires

including motor leads and other power wires shall be identified by wire markers as specified above.

11. Equipment ground wire insulation shall be colored green or green with two or more yellow stripes. Isolated grounding conductors shall be green with striping that identifies the conductor as "isolated ground" and different from the equipment (bonded) ground.

12. In general and unless otherwise shown on the drawings, no two wires of the same color shall be run in the same conduit except such as control wiring, switch legs, neutral, and ground. Where a conduit run is shown on the drawings to have two or more wires connected to the same phase and, therefore, are the same color, pressure sensitive, plastic marked wire marker identification tape shall be used wherever the wire is accessible (junction boxes, panels, device boxes, etc). The numbers shall in each case, correspond to the circuit number and panelboard from which the circuit emanates. Control wiring inside any compartment which may be energized from a source outside the compartment shall have insulation. Where yellow insulated wires are used inside any cabinet, compartment, etc., a machine engraved, laminated plastic identification marker shall be installed on the outside of the compartment.

13. Insulation on ungrounded conductors larger than AWG #10 and on grounded (neutral) and grounding (equipment ground) conductors larger than AWG #6 may be black with color coding accomplished with the use of colored plastic tape. Tape shall be installed on the conductors wherever they are visible and shall be wrapped at least three (3) turns around the conductor.

14. All wiring on this project, except control wiring, shall reflect the phase relationship as follows:

    480 volt system: brown, orange and yellow for ungrounded conductors, gray with brown tracer for neutral conductors.

    208Y/120 volt system: black, red and blue for ungrounded conductors, white for neutral conductors.

    120/240 volt, 3-phase
    4-wire, delta system: black, red for ungrounded conductors, orange for ungrounded conductor connected to "high leg", white for neutral.

C. Grounding

1. Ground rods shall be driven vertically into the earth to at least one foot below finished grade. Where a counterpoise or grounding grid is indicated and where rock is encountered at a depth of less than four (4) feet, rods shall be buried in a trench at not less than two feet below finished grade, and at equal angles from any two adjacent sides on the outside of the counterpoise or grid. In these cases, at the Contractor's option, equal lengths of bare conductor of the same size as the counterpoise or grid may be used in place of ground rods.
2. Conductors connecting the main ground bars in switchgear to the earth shall be continuous without joints or splices. Connections to the grounding system at the switchgear shall be made with pressure connectors such as defined in Article 100, "Connector, Pressure (Solderless)", of the National Electrical Code.
3. Connections to ground rods and all other ground connections below grade shall have a minimum mechanical contact surface area between the conductor and the ground rod of not less than three (3) square inches.
4. All connections made below finished grade shall be exothermic.
5. Installation of grounding conductors shall be such that they are not exposed to physical damage. All connections shall be firm and tight. Conductors and connectors shall be so arranged and provided so that there is no strain upon the connection. Buried equipment grounding conductors shall be buried at least 24 inches below finished grade and shall not be buried below concrete pads, paving, etc. except where running a tap to the grid or where shown on the contract drawings. Where buried below concrete or paving, grounding conductors shall be in rigid conduit unless shown on the drawings as a part of a grid.
6. Resistance measurements shall be made between the main grounding bar in the switchgear and a good earth ground. If this resistance is not equal to or less than 5 Ohms, an additional grounding electrode system in the form of ground rods installed and connected together in a 10 feet by 10 feet grid shall be added. The rods shall be connected together and this grid connected to the system with AWG #3/0 bare tinned copper. The number of rods shall be as required to register the resistance value mentioned above. Measurements shall be made in normally dry conditions and, in no case, less than 48 hours after rainfall. Submit a ground test report to the Engineer using the "Fall of Potential" method and appropriate ground testing instrumentation.
7. Where a bare conductor is the only conductor installed in conduit or other raceway, and this conductor is serving as a grounding conductor, it shall be bonded to the raceway that contains it at

each end of the raceway. The bond shall be made using a grounding type bushing and bonding jumper. The size of the jumper shall be the maximum size that the grounding bushing lug will accept and it shall be connected to the bushing with the lug and to the grounding conductor with a split bolt connector.

8. All metal electrical equipment cabinets (wireways, panels, switchgear, device boxes, junction and pull boxes, motor control panels, etc.) shall be securely bonded to a grounding conductor running through any conduit terminating at the cabinet or enclosure by use of a grounding lug bushing and jumper wire to the enclosure wall. Switchgear, panelboards and motor control equipment shall be provided with an equipment ground bus (including lugs or screw terminals) securely bonded to the enclosure. Junction boxes and other enclosures shall utilize an equipment ground bus or lug as required to securely bond the equipment grounding conductor to the enclosure. The grounding conductor shall be connected with pressure connectors at the main switchgear to the main grounding system. Where screw terminals or set screw lugs are used, sufficient lugs shall be provided such that not more than one conductor is installed into each lug or terminal.
9. No raceway shall serve as a grounding conductor.
10. All main feeder circuits and all branch circuits shall contain a grounding conductor sized according to Table 250-95, Article 250 of the National Electrical Code or as shown on the drawings. This grounding conductor shall be connected to the main grounding conductor in the switchgear from which the circuit emanates. Individual components of the system served by the main feeder circuit shall have their enclosures connected to the main feeder grounding conductor with pressure connectors.
11. The grounding conductor serving motor circuitry shall be connected inside the entrance compartment to the motor frame with a bolted solderless pressure connector. Bolts, nuts, washers and other assorted hardware shall be bronze, cadmium plated steel, or other corrosion resistant material. The motor ground connection shall be to the motor frame and independent of the mounting bolts or sliding base.
12. Where lightning arresters are furnished and installed either separately or with equipment and the grounding connections are not inherently provided, a suitable, separate, grounding conductor shall connect the lightning arrester with a separate ground rod. This rod shall be interconnected with any adjacent grounding system.
13. Grounded and Grounding Conductor: Connections to the grounding conductor and/or the neutral (grounded) conductor shall be made in such a manner that removal of any device or

equipment will not interrupt the continuity of these conductors to any device downstream from the device removed.

END OF SECTION

SECTION 16483

ADJUSTABLE FREQUENCY DRIVES

1.0 GENERAL

1.1 SCOPE

Provide three-phase, Adjustable Frequency Drives (AFD) as specified herein and as shown on the Contract Drawings.

1.2 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements

1.3 REFERENCES

A. The adjustable frequency drives and all components shall be designed, manufactured and tested in accordance with the latest applicable standards.

1. Underwriters Laboratories (UL508C: Power Conversion Equipment)
2. IEC 61800-3

1.4 SUBMITTALS

A. The following information shall be submitted to the Engineer for approval:

1. Dimensioned outline drawing
2. Schematic diagram
3. Power and control connection diagram(s)
4. Descriptive bulletins
5. Product sheets

B. O&M manuals are required in accordance with Section 16020 requirements. As-built wiring diagrams and as-built parameter settings list are required.

1.5 QUALIFICATIONS

A. The supplier of the assembly shall be the manufacturer of the electromechanical power components used within the assembly, such as bypass contactors when specified.

B. For the equipment specified herein, the manufacturer shall be ISO 9001 certified.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer's instructions. A copy of these instructions shall be included with the equipment at time of shipment.

2.0 PRODUCTS

2.1 MANUFACTURERS

The manufacturer shall be Allen Bradley, Eaton, Square D, or approved equal.

2.2 ADJUSTABLE FREQUENCY DRIVES (AFD)

A. Adjustable frequency drives shall have the following features:

1. The AFD shall be rated for the voltage indicated on the Drawings. The AFD shall provide microprocessor-based control for three-phase induction motors. The AFD shall be variable torque or constant torque as indicated on the Contract drawings. If not indicated, the AFD shall be rated for constant torque.
2. The AFD shall be of the Pulse Width Modulated (PWM) design converting the utility input voltage and frequency to a variable voltage and frequency output via a two-step operation. Adjustable Current Source AFDs are not acceptable. Insulated Gate Bipolar Transistors (IGBT's) shall be used in the inverter section. Bipolar Junction Transistors, GTO's or SCR's are not acceptable.
3. The AFD shall have efficiency at full load and speed that exceeds 95% for AFD below 15-HP and 97% for drives 15-HP and above. The efficiency shall exceed 90% at 50% speed and load.
4. The AFD shall maintain the line side displacement power factor at no less than 0.96, regardless of speed and load.
5. The AFD shall have a one (1) minute overload current rating of 150% and a three (3) second overload current rating of 180% for constant torque drives. The AFD shall have a one (1) minute overload current rating of 110% for variable torque drives.
6. The AFD shall be capable of operating of operating any NEMA design B squirrel cage induction motor, regardless of manufacturer, with a horsepower and current rating within the capacity of the AFD.
7. The AFD shall have an integral EMI/RFI filter as standard.

8. AFD shall have a 5% nominal impedance AC three-phase line reactor. The line reactor may be integral to or separate from the drive.
9. The AFD shall be able to start into a spinning motor. The AFD shall be able to determine the motor speed in any direction and resume operation without tripping. If the motor is spinning in the reverse direction, the AFD shall start into the motor in the reverse direction, bring the motor to a controlled stop, and then accelerate the motor to the preset speed.
10. Standard operating conditions shall be:
    a. Incoming Power: As indicated voltage (+10% to -15%) and 50/60 Hz (+/-5 Hz)
    b. Frequency stability of +/-0.05% for 24 hours with voltage regulation of +/-1% of maximum rated output voltage.
    c. Speed regulation of +/- 0.5% of base speed.
    d. Load inertia dependant carryover (ride-through) during utility loss.
    e. Insensitive to input line rotation.
    f. Humidity: 0 to 95% (non-condensing and non-corrosive).
    g. Altitude: 0 to 3,300 feet (1000 meters) above sea level.
    h. Ambient Temperature: -10 to 50 °C (CT), -10 to 40 °C (VT).
    i. Storage Temperature: -40 to 60 °C.
11. Control Functions
    a. AFD programmable parameters shall be adjustable from a digital operator keypad. The AFD shall have a alphanumeric programmable display with status indicators. Keypads must use plain English words for parameters, status, and diagnostic messages. Keypads that are difficult to read or understand are not acceptable, and particularly those that use alphanumeric code and tables. Keypads shall have backlighting.
    b. The keypad shall include a Local/Remote pushbutton selection. Both start/ stop source and speed reference shall be independently programmable for Keypad, Remote I/O, or Field Bus.
    c. The frequency drive shall include an Ethernet port for programming, monitoring, and control. Ethernet/IP or Modbus TCP is an acceptable protocol.
    d. The operator shall be able to scroll through the keypad menu to choose between the following:
        1. Monitor
        2. Operate
        3. Parameter setup
        4. Actual parameter values
        5. Active faults
        6. Fault history

7. Information to indicate the standard software and optional features software loaded.

e. The following setups and adjustments, at a minimum, are to be available:
   1. Start command from keypad, remote or communications port
   2. Speed command from keypad, remote or communications port
   3. Motor direction selection
   4. Maximum and minimum speed limits
   5. Acceleration and deceleration times, two settable ranges
   6. Critical (skip) frequency avoidance
   7. Torque limit
   8. Multiple attempt restart function
   9. Multiple preset speeds adjustment
   10. Catch a spinning motor start or normal start selection
   11. Programmable analog output
   12. DC brake current magnitude and time
   13. PID process controller

12. The AFD shall have the following system interfaces:
    a. Inputs – A minimum of four (4) programmable digital inputs, two (2) analog inputs and Ethernet communications interface shall be provided with the following available as a minimum:
       1. Remote manual/auto
       2. Remote start/stop
       3. Remote forward/reverse
       4. Remote preset speeds
       5. Remote external trip
       6. Remote fault reset
       7. Process control speed reference interface, 4-20mA DC
       8. Potentiometer and 1-10VDC speed reference interface
       9. Ethernet programming and operation interface port

B. Outputs – A minimum of two (3) discrete programmable digital outputs and two (2) programmable analog outputs shall be provided, with the following available at minimum.
   1. Programmable relay outputs with one (1) set of Form C contacts for each, selectable with the following available at minimum:
      a. Fault
      b. Run
      c. Ready
      d. Reversed
      e. Jogging
      f. At speed
      g. Torque Limit Supervision
      h. Motor rotation direction opposite of commanded
      i. Over-temperature

2. Programmable analog output signal, selectable with the following available at minimum:
   a. Motor current
   b. Output frequency
   c. Frequency reference
   d. Motor speed
   e. Motor torque
   f. Motor power
   g. Motor voltage
   h. DC-bus voltage
   i. AI1 (Analog Input 1)
   j. AI2 (Analog Input 2)
   k. PT100 temperature
3. Monitoring and Displays
   a. The AFD display shall be a LCD type capable of displaying the following thirteen (13) status indicators:
      1. Run
      2. Forward
      3. Reverse
      4. Stop
      5. Ready
      6. Alarm
      7. Fault
      8. Input/Output (I/O) terminal
      9. Keypad
      10. Bus/Communication
      11. Local (LED)
      12. Remote (LED)
      13. Fault (LED)
4. The AFD keypad shall be capable of displaying the following monitoring functions at a minimum:
   a. Output frequency
   b. Frequency reference
   c. Motor speed
   d. Motor current
   e. Motor torque
   f. Motor power
   g. Motor voltage
   h. DC-bus voltage
   i. Unit temperature
   j. Calculated motor temperature
   k. Voltage level of analog input
   l. Current level of analog input
   m. Digital inputs status
   n. Digital and relay outputs status
   o. Analog Input

5. Protective Functions
   a. The AFD shall include the following protective features at minimum:
      1. Over-current
      2. Over-voltage
      3. Inverter fault
      4. Under-voltage
      5. Input phase loss
      6. Output phase loss
      7. Under-temperature
      8. Over-temperature
      9. Motor stalled
      10. Motor over-temperature
      11. Motor under-load
      12. Logic voltage failure
      13. Microprocessor failure
   b. The AFD shall provide ground fault protection during power-up, starting, and running. AFD with no ground fault protection during running are not acceptable.
6. Diagnostic Features
   a. Fault History
      1. Record and log faults
      2. Indicate the most recent first, and store up to 30 faults
7. Enclosure
   a. The AFD enclosure shall be NEMA 1. Where indicated to be installed in an enclosure, the drive shall be NEMA rated as indicated on the Drawings. The AFD shall have complete front accessibility with easily removable assemblies.
8. Spare Parts
   a. The main logic board, keypad and power supply board shall be supplied as spares, one for each different part number supplied.
9. The AFD manufacturer shall maintain, as part of a national network, engineering service facilities within 200 miles of project to provide start-up service, emergency service calls, repair work, service contracts, maintenance and training of customer personnel.

3.0 EXECUTION

3.1 INSTALLATION

A. Install per manufacturer's instructions.
B. Configure parameters according to actual driven motor nameplate data.
C. Set the minimum and maximum speeds as directed by the pump manufacturer.

3.2 FIELD QUALITY CONTROL

A. Provide the services of a qualified manufacturer's employed Field Service Engineer to assist the Contractor in installation and start-up of the equipment specified under this section. Field Service personnel shall be factory trained with periodic updates and have experience with the same model of AFD on the job site. Sales representatives will not be acceptable to perform this work. The manufacturer's service representative shall provide technical direction and assistance to the Contractor in general assembly of the equipment, installation as specified in manufacturer's installation instructions, wiring, application dependant adjustments, and verification of proper AFD operation.

B. The Contractor. under the technical direction of the manufacturer's service representative shall perform the following minimum work.
   1. Inspection and final adjustments.
   2. Operational and functional checks of AFD and spare parts.
   3. The Contractor shall certify that he has read the drive manufacturer's installation instructions and has installed the AFD in accordance with those instructions.

C. The Contractor shall provide three (3) copies of the manufacturer's field start-up report.

3.3 MAINTENANCE / WARRANTY SERVICE

A. Warranty shall be a minimum of two years from the date of start-up and include all parts, labor, and travel time.

3.4 TRAINING

A. The Contractor shall provide a training session for up to 5 owner's representatives for ·a 4 hour period. Training and instruction time shall be in addition to that required for start-up service.

B. The manufacturer's qualified representative shall conduct the training.

C. The training program shall consist of the following:
   1. Instructions on the proper operation of the equipment.
   2. Instructions on the proper maintenance of the equipment.

END OF SECTION

SECTION 16900

CONTROL PANELS

1.0 GENERAL

1.1 SCOPE OF WORK

A. Control panels shall be provided as specified herein and as shown on the Contract Drawings.

1.2 RELATED WORK

A. Drawings and General and Supplementary Conditions of the Contract and Division 1 Specifications sections apply to this Section.

1.3 SUBMITTALS

A. Panel and enclosure plan and elevation drawings depicting all components and wiring duct

B. Complete wiring diagrams

C. Catalog cut-sheets on all components, with options clearly indicated and non-applicable items clearly excluded

D. Shop Drawings shall be clearly marked and or highlighted as to which product, type, option, etc. is being submitted. Product literature with one or more styles / configurations for a single product shall have a written description of use for each of the styles/configurations represented on the literature.

E. O&M manuals shall be submitted in accordance with Section 16020. They shall include all field modifications made such that the wiring diagrams exactly match the field-installed equipment and control panels. They shall also include complete cut-sheets, product data, operation, and maintenance information.

1.4 REFERENCES

A. NFPA 79 – All control panels shall comply with NFPA 79.

B. NEC – All control panels shall comply with NEC article 409.

C. UL698 – The pump control panel shall be listed to UL698A and shall bear

the UL label.

1.5 GENERAL REQUIREMENTS

A. All control panels furnished under this Contract shall be manufactured in accordance with industry standards and as herein specified. The Contractor shall coordinate all subcontractors and vendors to ensure that the control panels are furnished and meet the requirements specified herein.

B. Control panels shall be as manufactured by ControlWorks, Inc., Quality Controls, ADGO, or other UL or ETL qualified panel vendor. Panel construction shall comply with OSHA requirements and shall be either UL or ETL listed.

C. Control panels to be furnished on this project shall be wired to function according to schematics shown on the Contract Drawings. In addition to the requirements shown on the Contract Drawings, the panels shall adhere to additional requirements as written herein, and in the utilization equipment specifications.

D. All components shall be mounted with threaded screws to a subpanel inside the enclosure such that they are replaceable without removing the subpanel. All wiring must be stranded and protected by a circuit breaker. Supplementary circuit breakers may be utilized for circuits that require wiring smaller than 14 gauge. Wiring ducts for cable/conductor management are required to be utilized for routing of conductors and cables. Ducts are also required to be provided for field-wiring at the top and bottom of the panels. All field wires should terminate at a terminal strip upon entering the control panel enclosure.

E. Elementary control schematics and connection diagrams showing the spatial relationship of components and wiring shall be submitted for review. Also, a bill of materials, drawing of device arrangement on front, and enclosure fabrication drawings shall be submitted. Further, descriptive literature is required on all components. A copy of the as-built wiring diagrams and BOM shall be stored in a pocket inside the control panel enclosure.

F. Labels shall be installed on all wires, keynoted back to the elementary schematic or the connection diagram, and all terminals identified.

G. Short circuit ampacity: Shall be 5kA minimum

2.0 PRODUCTS

2.1 ENCLOSURES

A. Control panel enclosure shall be wall-mount type where sized at 30" width x 42" height or less. Otherwise, it shall be floor-mount type. Enclosure shall include either a NEMA flange-mounted lockable disconnect, or an IEC style rotary lockable disconnect. Enclosures shall be manufactured by Hoffman, or equal.

B. Enclosure NEMA rating shall be NEMA 12. The enclosure shall be sized to provide 25% spare panel space. Seams shall be continuously welded and ground smooth.

C. Enclosure door shall have a 3-point latch. Screw clamps are not acceptable. The latch handle shall have a padlock hasp.

D. Operator devices shall be mounted on the exterior of the enclosure. The enclosure shall also have an interior pocket for holding wiring diagrams, and an interior sub-panel for mounting control equipment.

2.2 WIRING REQUIREMENTS

A. Wire and cable shall comply with Section 16120 except Type MTW conductors shall be used inside the control panel for control circuits. Control circuit wiring shall be 18 gauge or larger.

B. Control wiring shall be terminated using crimp-type ferrule, fork, or ring terminals. Power wiring shall utilize compression lugs.

C. Wiring shall extend to terminal blocks for connection to external equipment.

2.3 TEMPERATURE CONTROL DEVICES

A. Not required for panels located inside the building.

2.4 MOTOR CONTROLS

A. Starters

1. All magnetic starters and contactors shall be steel mounted, front wired with all terminals accessible for wiring directly from the front. Movable contact blocks shall depend on gravity only and not the use of springs for operation to the open position.

2. Starters shall be NEMA type and sized appropriately for the motor to be controlled, but in no case shall any starter or contactor be smaller than NEMA size 1 or smaller than as indicated on the Drawings. IEC starters are not acceptable.

3. All contactors shall be double break, solid silver cadmium oxide alloy, or equal. Bare copper or silver flashed copper contacts which require periodic filing or cleaning maintenance will not be permitted.

4. Operating coils shall be pressure molded and so designed that, if accidentally connected to excessive voltage they will not expand, bubble or melt. When a coil fails under and condition, the starter shall open and shall not "freeze" in the closed (on) position. Coils shall be replaceable from the front of the starter without having to remove the starter from the panel or enclosure.

5. Combination starters shall be of the molded case circuit breaker type. Trip elements of multi-pole breakers shall be effectively insulated from one another. Multi-pole breakers shall be designed such that an overload on one pole opens all poles simultaneously. Breakers shall be quick-make, quick-break and shall be entirely trip free to prevent the contacts being held in a closed position against a short circuit. Breakers for full voltage starters shall be the magnetic only type. All others shall be thermal magnetic.

6. Each starter leg shall have a thermal overload device in each ungrounded leg. The overload shall be bimetal, ambient compensated, thermal element type. Solid state overload devices, are not acceptable. If the adjustable trip type are used, a lockable cover must be provided to prevent unauthorized adjustment.

2.5 OVERCURRENT PROTECTION

A. Main Single-Phase Breakers – Shall be Din-rail mountable with clear "on," "off," and "tripped" positions, Square D QOU or equal. Where a substantial number of breakers are used, provide a panelboard mounting base.

B. Combination Starters – Circuit breakers for use with combination starters shall be magnetic-only, Square D MagGuard, or equal, with adjustable trip settings.

C. Supplementary Protectors – Shall be Din-rail mountable UL489 listed. Trip rating shall match load served.

D. Power Fuses – Utilize Class J fuses and fuse blocks. Fuse blocks must have protective cover. Fuses may only be used where indicated on the Drawings. Otherwise, use circuit breakers.

2.6 MISCELLANEOUS PANEL COMPONENTS

A. Terminal Blocks, #10 conductor size and smaller.

1. Terminal blocks shall be Din-rail mountable IEC style with minimum width of 6.2 mm. They shall be rated for conductors from #10 to #24 AWG. Current rating shall be 30A, minimum. Terminal blocks shall be finger-safe. Double level terminal blocks may be utilized where necessary to conserve space.
2. Screw clamp terminal blocks are required. Terminal blocks that rely upon spring pressure only for conductor termination are not acceptable.
3. Provide cross connection bridges, partition plates, end anchors, zack strip labels, and all other components necessary for a complete installation. Each block shall be labeled with a machine-printed label. No more than 2 conductors may be landed under on single terminal block terminal screw.
4. Utilize the following terminal block colors:
    a. 120V Power – Black
    b. 120V Control – Red
    c. 120V Neutral – White
    d. Equipment Grounding – Green or Green/Yellow
    e. DC Positive – Blue
    f. DC Negative/Grounded – Gray
    g. Conductor energized from remote source: Yellow
5. Terminal blocks shall be manufactured by Phoenix Contact, Allen-Bradley, or equal.

B. Fuse blocks (control circuits) – Fuse blocks shall be finger safe and shall have LED indication when the fuse is blown. Fuses may be used only where indicated on the Drawings; otherwise use circuit breakers.

C. Conductor Labels – Shall be the heat-shrink type, machine printed. Brady, or equal.

D. Component nameplates – Shall be engraved, rigid, laminated plastic with adhesive back and letter height of 3/16" minimum. Nameplates shall be white with black letters.

E. Intrinsic Safety Barriers – Provide UL listed intrinsic safety barriers for circuit extensions into hazardous areas. The barriers shall be Phoenix Contact, or equal.

F. Control transformers shall be machine tool type transformers with epoxy encapsulated coils or resin impregnated coils, high quality silicon steel laminations, copper magnet wire, molded-in terminals, and 55°C rise insulation system.

G. Pilot Devices

1. Selector switches shall be NEMA 4X, 30mm, oil-tight construction, and of the quick-make, quick-break type.

2. Pushbuttons shall be NEMA 4X oil-tight, 30mm.

3. Pilot lights shall be 30mm, oil-tight, push-to-test, NEMA 4X LED type. Green pilot lights shall be used for indicating "pump running," and yellow shall be used for "seal leak."

4. Elapsed time meters shall be non-resettable.

5. Timing relays shall have an adjustable time range suitable for the application, with the time delay occurring after energization.

H. Control Relays

1. Control relays shall be magnetic, general purpose, "ice cube" type with 3-pole (minimum), double throw contacts rated at 5 amperes (minimum), 120 volts (minimum). Coils shall be rated to operate at the indicated control voltage.

2. Provide proper bases, mounting track, etc. for a complete installation. All relays shall have manual operator, and pilot light. Coils connected to solid-state digital outputs shall have transient surge protection.

I. Surge Protection – Provide EDCO HSP121BT-1RU or equal.

2.8 PUMP CONTROLLERS

A. Duplex Pump Variable Speed Controller

1. The controller shall be rated for 120VAC +/- 10% supply power with MOV transient protection.
2. Controller shall be UL508 listed.
3. Temperature range shall be -4 to 122 degree F.
4. Controller shall include an LED level display and LED indicators.
5. Controller shall have an isolated 24VDC power supply for level

instrument.

6. Controller shall have a transient-protected 4-20mA input.
7. Controller shall have four isolated analog outputs to control pump speed. One of the outputs shall have the capability to be programmed as a wetwell level output.
8. Controller shall have a pre-engineered algorithm for controlling the variable speed pumping station.
9. Controller shall accept all of the I/O indicated on the Drawings.
10. Controller shall have alternation and locked-load capability.
11. Controller shall be Blue Ribbon Model BB4000, or equal.

3.0 EXECUTION

3.1 LABELING

A. Provide labels for all conductors and components.

B. Legends for starter nameplates shall be taken from the one line diagram in the Contract Drawings. Wire and miscellaneous component labels shall match the O&M manual wiring diagrams.

3.2 GROUNDING

A. Enclosures shall be grounded in accordance with the NEC.

B. Each analog signal loop shall be grounded at a single point for the loop at the location of the DC power supply for the loop.

3.3 PROTECTION

A. All electrical and electronic components of the Control Panel shall be protected against damage due to electrical transients induced in interconnecting lines from lightning discharges and surges in nearby electrical systems. Provide a surge protection device (SPD).

3.4 INSTALLATION/ERECTION

A. Equipment furnished under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with the Drawings, Specifications, manufacturer Shop Drawings, and manufacturer installation instructions.

END OF SECTION

SECTION 17010

GENERAL SCADA REQUIREMENTS

1.0 GENERAL

1.1 SCOPE OF WORK

A. The Contractor shall furnish and install all materials, services, spare parts, commissioning, and other services as shown and specified and as required to install a new RTU and pump station monitoring system and integrate it into the existing Wood Creek Water District SCADA system. The existing system was installed by Micro-Comm:

Micro-Comm, Inc.	Local Representative:
15895 S. Plfumm Rd	Brian Gatewood; Delaney and Associates
Olathe, KS 66066	Tel: 859-342-4944

B. All SCADA equipment shall be installed, connected, and left in operating condition. The number and size of cables and conductors between all equipment and SCADA monitoring/control devices shall be as required to obtain the operation described in these Specifications, and/or by the Contract Drawings, and/or as shown in manufacturer-furnished, Engineer-reviewed Shop Drawings. The Contractor shall be responsible for supplying all components such as relays, loop isolators, transducers, etc., as necessary, whether indicated or not, at no additional cost to the Owner in order to leave a complete functional SCADA system. The Contractor shall ensure compatibility between all system components and provide any necessary peripheral equipment as required to make the components compatible.

C. Bidders are required to visit the construction site prior to submitting a bid and carefully examine the Contract Drawings and Specifications so that he/she may fully understand what is to be done and to document existing conditions. Any discrepancies, questions, or omissions must be brought to the attention of the Engineer at least 10 days prior to the bid opening date. Extras will not be approved for work that the Contractor should have seen beforehand by visiting the site prior to bidding.

D. The existing SCADA software shall be updated to latest version with all security patches/updates installed.

1.2 RELATED WORK

A. Contractors bidding work under this Contract shall read and understand Division Zero and Division 1 - General Requirements. If any discrepancies

are discovered between the General Instrumentation and Supervisory Control and Data Acquisition (SCADA) Requirements and General Requirements, the above-mentioned documents shall overrule this section. The General Instrumentation/SCADA Requirements are intended as a supplement to the above-mentioned documents. The Contractor shall bid as outlined in the above-mentioned Specifications and shall be governed by any alternates or unit prices called for in the form of proposal.

B. Division 16 - Electrical

1.3 SUBMITTALS

A. A pre-bid submittal is required a minimum of two weeks prior to bid opening date for any suppliers proposed other than Micro-Comm.

B. Shop Drawings including descriptive literature and/or installation, operation and maintenance instructions shall be submitted in the amount of copies as listed in the General Conditions, but no less than 8 copies. All Shop Drawings shall be submitted in loose-leaf three-ring cardboard reinforced vinyl binders with extensive indexing. Each sheet in the binder shall have hole reinforcements. Should there be any exceptions to the Specifications, the Supplier shall completely describe such in front of the submittal via a point-by-point letter referencing the specification paragraph number. The submittal shall be arranged as follows:

1. Front Cover – Project description and pertinent information
2. First Page – Review stamp page.
3. Next – Index
4. Next – Overall description of the system
5. Next – Complete manufacturer's information on all equipment and software
6. Next – Complete manufactured drawings of panels including a detailed point by point wiring diagram of each. Drawings shall be either 8.5"x11" or 11"x17". The first page of each product literature shall have the tag designation clearly indicated. Provide for each loop, the selected size of the equipment being submitted, NEMA classification, sizing calculations, and calibration data for all metering devices. Selected options shall be clearly indicated and excluded items shall be clearly marked out.
7. Next – Complete list of spare parts, training program outline, Warranty description and information.

C. Shop Drawings shall be submitted on all equipment specified in this Division unless a specific written exemption is obtained from the Engineer. The Contractor shall not procure or install any materials or equipment without approved shop drawings.

D. The Engineer reserves the right to make modifications to instrumentation & Scada equipment after Shop Drawing review, if the Instrumentation/Scada Shop Drawings are submitted prematurely (prematurely meaning submitted before all process equipment has been reviewed and accepted). Cost of modifications shall be the Contractor's responsibility.

E. Software Submittals: Not required for this project.

F. Operation & Maintenance: Manuals shall be accepted shop drawings with the following modifications:

1. Include complete addresses of all equipment manufacturing representatives and phone numbers of each.

2. Incorporate complete record drawings indicating final installation of equipment and wiring.

3. Include complete manufacturer's installation, operations, and maintenance manual for each piece of equipment and software supplied.

4. Complete parts lists with stock numbers.

5. Include a configuration record for each piece of equipment, including all parameter settings and set points.

6. Include NIST or other calibration certificates for Instrumentation.

7. The manuals shall include compact discs or DVDs with the following saved information:

   a. Backup of all programs developed/modified in the course of the project.
   b. Backup of all reports, databases, set point listings, and all other electronic information utilized in the project.
   c. Electronic copy of all installation, operations, and maintenance manuals which are available from the manufacturer in electronic format.

1.4 QUALITY ASSURANCE

A. The Contractor shall be a factory authorized representative capable of start-up services of the equipment or shall provide the services of a factory authorized representative.

B. In order to achieve standardization for appearance, operation, maintenance, spare parts and manufacturer's service to the greatest extent possible, like

items of equipment provided hereunder shall be the end products of one (1) manufacturer.

C. Software Progress Meetings: Not required for this project.

1.5 SYMBOLS AND ABBREVIATIONS

A. The symbols and abbreviations generally follow standard instrumentation and electrical practice, however, exceptions to this shall be as shown on the Contract Drawings.

1.6 COORDINATION WITH OTHER TRADES

A. The Contractor shall coordinate the SCADA work with that of other trades to ensure proper installation and functionality of all equipment and process control/monitoring programs. Installation of equipment may be performed by other trades unless specified otherwise.

1.7 CODES

A. The minimum standard for all work shall be the latest revision of the Kentucky Building Code (KBC), and the National Electrical Code (NEC). Whenever and wherever state and/or local laws or ordinances and/or regulations and/or the Engineer's design require a higher standard than these codes, then these laws and/or regulations and/or the design shall be followed.

B. Following is a list of other applicable Standards or Codes:

1. Kentucky Building Code	KBC
2. National Electrical Code	NEC
3. International Electrotechnical Commission	IEC
4. Underwriters Laboratories, Inc.	UL
5. Factory Mutual System	FM
6. National Fire Protection Association	NFPA
7. National Electrical Manufacturers Association	NEMA
8. Occupational Safety and Health Administration	OSHA
9. National Institute of Standards and Technology	NIST
10. Instrument Society of America	ISA
11. Institute of Electrical and Electronic Engineers, Inc.	IEEE
12. American National Standards Institute, Inc.	ANSI
13. Joint Industry Council	JIC
14. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.	ASHRAE
15. Federal Communications Commission	FCC
16. American Society for Testing and Materials	ASTM

1.8 STORAGE

A. All work, equipment, and materials shall be protected against dirt, water, or other injury during the period of construction.

B. Sensitive SCADA equipment shall be protected against injury or corrosion due to atmospheric conditions or physical damage by other means. Protection is interpreted to mean that equipment shall be stored under roof, in a structure properly heated in cold weather and ventilated in hot weather. Provision shall be made to control the humidity in the storage area to 50 percent relative. The stored equipment shall be inspected periodically, and if it is found that the protection is inadequate, further protective measures shall be employed. SCADA equipment shall not be installed until the structure is under roof with doors and windows installed.

1.9 ERRORS, CORRECTIONS, AND/OR OMISSIONS

A. Should a piece of process equipment be supplied of a different type or manufacture than shown or specified in the Contract documents, the Contractor shall be responsible for installing, programming, and commissioning the proper SCADA equipment for proper operation and monitoring of that process equipment at no extra cost to the Owner.

B. It is the intent of these Specifications to provide for an SCADA system installation complete in every respect, to operate in the manner and under conditions as shown in these Specifications and on the Contract Drawings. The Contractor shall notify the Engineer, in writing, of any omission or error at least 10 days prior to opening of bids. In the event of the Contractor's failure to give such notice, he/she may be required to correct work and/or furnish items omitted without additional cost. The submission of a bid indicates that the Contractor believes the design to be sound and can provide a fully functional and complete SCADA system. Further requirements on this subject may be found in the General Requirements, Division 1.

1.10 GUARANTEES AND WARRANTIES

A. The Contractor shall guarantee all work including equipment, materials, and workmanship. This guarantee shall be against all defects of the electrical system or improper equipment operation. It shall last for the period of time specified in the General Conditions of the Contract, but not less than one year from the date of system acceptance (i.e. – when the Engineer accepts that the punchlist is complete) and includes on-site repair of defects or problems.

B. Equipment manufacturers shall provide a minimum of one-year of off-site technical support dating from final acceptance. The costs of this shall be

included in the bid Certification of this shall be provided to the Owner with the O&M manuals.

1.11 TESTING

A. After the SCADA system is complete, and at such time as the Engineer may direct, the Contractor shall conduct an operating & performance test for acceptance. The system shall be demonstrated to operate in accordance with the requirements of these Specifications and the Contract Drawings. The test shall be performed in the presence of the Engineer or his authorized representative. The Contractor shall furnish all instruments, hardware, software, and personnel required for the tests.

1.12 UTILITY AND REGULATORY COORDINATION

A. The Contractor is responsible for coordinating all activities required by the necessary utilities and regulatory agencies. This includes obtaining telemetry licensing from FCC for the site if necessary.

B. Any special provisions required by the utilities or regulatory agencies shall be as outlined on the Contract Drawings or as advised by the utility at the time of construction, and work required by these special provisions shall be executed with no extra cost to the Owner.

1.13 TRAINING

A. Not required for this project.

1.14 RECORD DRAWINGS

A. The Contractor shall maintain 1 set of the Contract Drawings on the job in good condition for examination at all times. The Contractor's qualified representative shall enter upon these drawings, from day to day, the actual record of construction and/or alteration progress. Entries and notes shall be made in a neat and legible manner and these drawings delivered to the Engineer after completion of the construction, for use in preparation of Record Drawings.

1.15 MAINTAINING CONTINUOUS PROCESS CONTROL AND MONITORING SYSTEM

A. Existing system(s) continuity shall be maintained at all times. In no way shall the installation and/or alteration of the SCADA work interfere with or stop the normal operation of the existing facilities, except where prior arrangements have been made.

B. When additions and modifications to existing system(s) require outages of duration in excess of a few minutes, arrangements shall be made in advance for such outages. All outages shall be held to an acceptable minimum. If necessary, outages shall be performed on premium time. Under no circumstances shall a process control/monitoring outage of any duration be initiated until the Owner and Engineer have concurred, and as far as possible in advance.

1.16 RECEIPTS

A. Some sections of the Specifications call for equipment, materials, accessories, etc. to be furnished and "turned over to the Owner" or like requirements. The Contractor shall obtain a receipt for each item turned over, signed by the Owner or his representative. A copy of this receipt shall be transmitted to the Engineer.

B. When a question arises concerning whether items have been turned over to the Owner, and there is no signed receipt, it may be assumed that the items were not furnished.

2.0 PRODUCTS

2.1 MATERIALS

A. All materials used shall be new unless noted otherwise. All materials shall be UL listed for the application, where a listing exists. Additional requirements are found in Division 1. All equipment shall meet applicable FCC requirements and restrictions.

B. The material and equipment described herein has been specified according to a particular trade name or make to set quality standards. However, each Contractor has the right to substitute other material and equipment in lieu of that specified, other than that specifically mentioned for standardization, providing such material and equipment meets all of the requirements of that specified and is accepted, in writing by the Engineer.

C. The reuse of salvaged equipment will not be permitted unless specified herein or indicated on the Contract Drawings.

D. Remote Terminal Units: Provide Micro-Comm RTU with the following features

1. Enclosure: NEMA 12 painted steel.
2. Battery backup (minimum 1 hour).
3. Radio to match existing Wood Creek radios.
4. Power surge suppressor with relay contact to indicate failure.

5. Polyphaser or equal antenna feedline surge protection.
6. Controller with I/O suitable for monitoring the status points indicated on the Contract drawings, power failure, comm failure, and the following future I/O:
   a. Future digital input x4
   b. Future digital output x2
   c. Future analog input x2
   d. Future analog output x2

E. Antenna system: Existing antenna may be reused.

3.0 EXECUTION

3.1 GROUNDING AND BONDING

A. All metallic conduit, cabinets, supporting framework and SCADA equipment shall be grounded in accordance with the latest issue of the National Electrical Code.

3.2 ANCHORING/MOUNTING

A. SCADA equipment shall be rigidly supported. Anchors used shall be metallic expansion type, or if appropriate to prevent spalling concrete, epoxy set type. Plastic or explosive type anchors are prohibited.

3.3 SOFTWARE SERVICES

A. General: Software services shall include program development, testing, documentation, and work necessary to integrate the new pump station status points into the existing SCADA software. It shall also include updating the existing software to latest version and installing patches/security fixes.

B. Integrate the I/O points indicated on the Contract Drawings. Also provide a communications failure alarm and power failure alarm. Provide a new screen for the Pittsburg pump station and integrate into the overview screen also. All equipment/alarm status points shall be transmitted live on a change in state, or in no case longer than one minute polling interval.

C. Alarm Management: For each process or system event classed as an alarm provide facilities for displaying and logging in database, acknowledgment, and purging of stale messages. Log and display both alarm events and returns to normal. Provide date/time stamps for events, descriptive message, and event type code. Use color combinations to distinguish following alarm states: Alarm-Unacknowledged, Alarm-Acknowledged, Normal-Unacknowledged, and Normal-Acknowledged. High level alarm or power outage shall provide dial-out notification to operator.

D. Graphic Displays:

1. Provide process-oriented displays showing current process status including pumps and wetwell level with elevation text. Emphasis shall be placed on depicting the pump station in a "P&ID" format that allows easy conceptualization of process flow rather than depicting equipment in actual physical location or scale.

2. Not running state: graphic shall be natural color with no motion.

3. Running state: Graphic shall be green color and shall rotate or show other type of motion as appropriate. Both color and motion shall be depicted.

4. Red color shall be reserved for alarm graphics.

5. Wetwell shall include both analog and digital indication of current level status. Also, static text must be added to indicate level at bottom of tank and top (or overflow) of tank.

6. Indicators shall use an appropriate number of significant digits and dead band to produce steady values.

E. Trending: Provide on-screen trending displays that are user definable that operate from either previously collected historical trend groups (named file) or from a group of real-time variables. Provide facilities for user selection of colors, time (horizontal), and measurement (vertical) scales. Accommodate real-time sampling intervals as short as 1 second. Real-time trends shall show alarm setpoints. Historical trend displays shall have time-scale panning controls. All trends must have an adjustable cursor that indicates both Y and X axis values at the user-selected location. For each tag selected to be trended on the Contract Drawings, provide a pre-configured trend that shows both real-time and historical values. Certain tags may be added to the same trend where appropriate as long as they are uniquely identified via color and label.

F. Reports:

1. Reporting requirements shall consist of both live HMI screens that dynamically update the values for "today"/"yesterday"/"this month"/"last month" and also a published log of historical values. The log may be CSV or PDF.

2. Daily totals shall be published at 11:59:55 PM and reset to zero at midnight. Monthly totals shall be published at 11:59:55 PM on the last day of the month and reset at midnight.

3. Totalization time slices shall not exceed 5 seconds.

4. The following parameters shall be reported:

   a. Motor & Equipment Run times: For each motor or piece of equipment that is monitored, report "Run Time Today" and "Run Time Yesterday".

   b. Motor & Equipment # of Starts: Report "# Starts Today" and "# Starts Yesterday"

   c. Flow Totals: For each flow meter, report "Flow Total Today", "Flow Total Yesterday", "Flow Total This Month", and "Flow Total Last Month." Also provide this report for chemical flow by calculation based on pump speed and runtime and chemical pump capacity.

3.4 PERFORMANCE TEST

A. Following installation, checkout, and final adjustment of software, the Contractor shall schedule a performance test in the presence of the Engineer and the Owner.

B. Demonstrate to the Engineer and Owner that each I/O point scheduled on the Contract Drawings has been integrated and is functioning properly.

C. Demonstrate trending, reporting, and alarm messaging has been configured properly and is operational.

D. Software development shall not be accepted until the SCADA system functions for at least one week with no nuisance alarms. Nuisance alarms shall be as defined by the Engineer.

END OF SECTION

STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

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General Certification--Nationwide Permit # 12
Utility Line Backfill and Bedding

This General Certification is issued March 19, 2012, in conformity with the requirements of Section 401 of the Clean Water Act of 1977, as amended (33 U.S.C. §1341), as well as Kentucky Statute KRS 224.16-050.

For this and all nationwide permits, the definition of surface water is as per 401 KAR 10:001 Chapter 10, Section 1(80): Surface Waters means those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Lagoons used for waste treatment and effluent ditches that are situated on property owned, leased, or under valid easement by a permitted discharger are not considered to be surface waters of the commonwealth.

Agricultural operations, as defined by KRS 224.71-100(1) conducting activities pursuant to KRS 224.71-100 (3), (4), (5), (6), or 10 are deemed to have certification if they are implementing an Agriculture Water Quality Plan pursuant to KRS 224.71-145.

For all other operations, the Commonwealth of Kentucky hereby certifies under Section 401 of the Clean Water Act (CWA) that it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 304, 306 and 307 of the CWA, will not be violated for the activity covered under NATIONWIDE PERMIT 12, namely Utility Line Backfill and Bedding, provided that the following conditions are met:

1. The activity will not occur within surface waters of the Commonwealth identified by the Kentucky Division of Water as Outstanding State or National Resource Water, Cold Water Aquatic Habitat, or Exceptional Waters.

2. The activity will not occur within surface waters of the Commonwealth identified as perpetually-protected (e.g. deed restriction, conservation easement) mitigation sites.

3. This general water quality certification is limited to the crossing of surface waters by utility lines. This document does not authorize the installation of utility lines in a linear manner within the stream channel or below the top of the stream bank.

4. For a single crossing, impacts from the construction and maintenance corridor in surface waters shall not exceed 50 feet of bank disturbance.

5. This general certification shall not apply to nationwide permits issued for individual crossings which are part of a larger utility line project where the total cumulative impacts from a single and complete linear project exceed ½ acre of wetlands or 300 linear feet of surface waters. Cumulative impacts include utility line crossings, permanent or temporary access roads, headwalls, associated bank stabilization areas, substations, pole or tower foundations, maintenance corridor, and staging areas.

6. Stream impacts under Conditions 4 and 5 of this certification are defined as the length of bank disturbed. For the utility line crossing and roads, only one bank length is used in calculation of the totals.

7. Stream impacts covered under this General Water Quality Certification and undertaken by those persons defined as an agricultural operation under the Agricultural Water Quality Act must be completed in compliance with the Kentucky Agricultural Water Quality Plan (KWQP).

8. The Kentucky Division of Water may require submission of a formal application for an individual certification for any project if the project has been determined to likely have a significant adverse effect upon water quality or degrade the waters of the Commonwealth so that existing uses of the water body or downstream waters are precluded.

9. Activities that do not meet the conditions of this General Water Quality Certification require an Individual Section 401 Water Quality Certification.

10. Blasting of stream channels, even under dry conditions, is not allowed under this general water quality certification.

11. Utility lines placed parallel to the stream shall be located at least 50 feet from an intermittent or perennial stream, measured from the top of the stream bank. The cabinet may allow construction within the 50 foot buffer if avoidance and minimization efforts are shown and adequate methods are utilized to prevent soil from entering the stream.

12. Utility line stream crossings shall be constructed by methods that maintain flow and allow for a dry excavation. Water pumped from the excavation shall be contained and allowed to settle prior to re-entering the stream. Excavation equipment and vehicles shall operate outside of the flowing portion of the stream. Spoil material from the excavation shall not be allowed to enter the flowing portion of the stream.

13. The activities shall not result in any permanent changes in pre-construction elevation contours in surface waters or wetlands or stream dimension, pattern or profile.

14. Utility line activities which impact wetlands shall not result in conversion of the area to non-wetland status. Mechanized land clearing of forested wetlands for the installation or maintenance of utility lines is not authorized under this certification.

15. Activities qualifying for coverage under this General Water Quality Certification are subject to the following conditions:

- Erosion and sedimentation pollution control plans and Best Management Practices must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur.
- Sediment and erosion control measures, such as check-dams constructed of any material, silt fencing, hay bales, etc., shall not be placed within surface waters of the Commonwealth, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in such a manner that may result in instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control devices shall be removed and the natural grade restored within the completion timeline of the activities.
- Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
- Removal of riparian vegetation shall be limited to that necessary for equipment access.
- To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions.
- Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances in which such in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation.

- Any fill shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If rip-rap is utilized, it should be of such weight and size that bank stress or slump conditions will not be created because of its placement.

- If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when such work will be done.
- Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling (800) 928-2380.

Non-compliance with the conditions of this general certification or violation of Kentucky state water quality standards may result in civil penalties.