



KENVIRONS

RECEIVED

SEP 20 2013

PUBLIC SERVICE
COMMISSION

TECHNICAL SPECIFICATIONS
GREEN RIVER VALLEY WATER DISTRICT
RIO VERDE DAM IMPROVEMENTS

HART COUNTY, KENTUCKY

PROJECT NO. 2012123

PREPARED BY:

KENVIRONS, INC.
452 VERSAILLES ROAD
FRANKFORT, KENTUCKY 40601

June 2013

Kenvirons, Inc.

Civil & Environmental Engineering and Laboratory Services

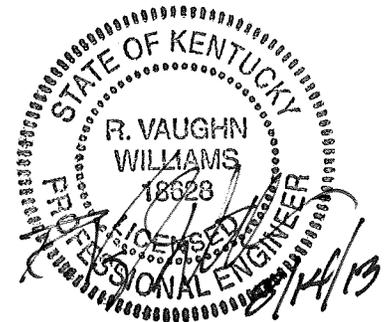
CONTRACT DOCUMENTS AND SPECIFICATIONS

**GREEN RIVER VALLEY WATER DISTRICT
HART COUNTY, KENTUCKY**

RIO VERDE DAM IMPROVEMENTS

PREPARED BY:

**KENVIRONS, INC.
452 VERSAILLES ROAD
FRANKFORT, KY 40601**



PROJECT No. 2012123

AUGUST 2013

TABLE OF CONTENTS

<u>No.</u>		<u>Pages</u>
00100	Advertisement for Bids	2
00200	Instructions to Bidders	8
00410	Bid Form	5
00430	Bid Bond	2
	Certification Regarding Debarment, Suspension and Other Responsibility Matters	1
	Certification Regarding Lobbying	1
	Certification Regarding Equal Employment Opportunity	1
00510	Notice of Award	1
00521	Agreement	6
00550	Notice to Proceed	1
00610	Performance Bond	2
00615	Payment Bond	2
00625	Certificate of Substantial Completion	1
00710	General Conditions	57
00715	Supplementary Conditions	3
00941	Change Order	1
	Wage Determination	
	Technical Specifications	
01025	Measurement and Payments	11
02112	Site Clearing and Grubbing	2
02250	Drilling and Pressure Grouting	18
02374	Rip-Rap	1
02378	Erosion and Sediment Control	5
02920	Re-Vegetation	4
03300	Cast-In-Place Concrete	18
05030	Intake Screens	2
13109	HDPE Piping	4
13110	Pipe Handling and Installation	11
13120	Waterline Accessories	5

**Section 00100
Advertisement For Bids**

**Rio Verde Dam Improvements
Green River Valley Water District
Hart County, Kentucky**

Separate Sealed BIDS for the construction of the Rio Verde Dam Improvements will be received by Green River Valley Water District at 85 E. Les Turner Road, Cave City, KY 42127 until September 4, 2013 at 2:00 P.M., local time, and then publicly opened and read aloud.

The Contract consists of the installation of a grout curtain to reduce the seepage along the west abutment of the Rio Verde Dam, 920 L.F. of 24" HDPE pipe and appurtenances to divert the base flow around the dam, and various dam remedial improvements.

The CONTRACT DOCUMENTS may be examined at the following locations:

GREEN RIVER VALLEY WATER DISTRICT, 85 E. LES TURNER ROAD, CAVE CITY, KY 42127
KENVIRONS, INC., 452 VERSAILLES ROAD, FRANKFORT, KY 40601
F. W. DODGE/AGC, 950 CONTRACT STREET, LEXINGTON, KY 40505

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 \$75.00 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 \$500 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. The contractor shall carry out applicable requirements of 40 CFR part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or other legally available remedies.

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 Green River Valley 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.

Green River Valley Water District

By: David Paige
Manager

SECTION 00200 INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

	Page
Article 1 - Defined Terms	1
Article 2 - Copies of Bidding Documents	1
Article 3 - Qualifications of Bidders	1
Article 4 - Examination of Bidding Documents, Other Related Data, and Site	2
Article 5 - Pre-Bid Conference	4
Article 6 - Site and Other Areas	4
Article 7 - Interpretations and Addenda	4
Article 8 - Bid Security	5
Article 9 - Contract Times	5
Article 10 - Liquidated Damages	5
Article 11 - Substitute and "Or-Equal" Items	5
Article 12 - Subcontractors, Suppliers, and Others	5
Article 13 - Preparation of Bid	6
Article 14 - Basis of Bid; Comparison of Bids	7
Article 15 - Submittal of Bid	7
Article 16 - Modification and Withdrawal of Bid	7
Article 17 - Opening of Bids	7
Article 18 - Bids to Remain Subject to Acceptance	8
Article 19 - Evaluation of Bids and Award of Contract	8
Article 20 - Contract Security and Insurance	8
Article 21 - Signing of Agreement	8

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 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 4.02 of the General Conditions has been identified and established in paragraph 4.02 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

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 4.06 of the General Conditions has been identified and established in paragraph 4.06 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

- 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 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in paragraph 4.06 of the General Conditions.
- 4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.
- 4.06 Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such other work.
- 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 4.02 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 4.06 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;

- 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 be held at 10:00 A.M. local time on August 28, 2013 at the project site on Glenbrook Hotel Road, Munfordville, KY 42765. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6 - SITE AND OTHER AREAS

- 6.01 The Site is identified in the Bidding Documents. 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, 2002 Edition) issued by a surety meeting the requirements of paragraphs 5.01 and 5.02 of the General Conditions.
- 8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 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 Bid opening.

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, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or "or-equal" materials and equipment as defined in paragraph 6.05 of the General Conditions, or those substitute materials and equipment approved by the Engineer and identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function, and quality to be met by any proposed substitute or "or-equal" item. No item of material or equipment will be considered by Engineer as a substitute or equal until after the bids have been opened and the contract has been awarded. The burden of proof of the merit of the proposed item, and cost for review of a proposed substitute item, is upon the Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. Bidders shall not rely upon approvals made in any other manner. Any reduction made in contract price due to approval of a substitute item or equal, will be subtracted from the bidders contract and placed into contingency funds for the project.

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

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

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

- 12.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest responsible Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner 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 6.06.

ARTICLE 13 - PREPARATION OF BID

- 13.01 The Bid form is included with the Bidding Documents. Additional copies may be obtained from Engineer.
- 13.02 All blanks on the Bid form shall be completed 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 Form. 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 11.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. 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, non-responsive, 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 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it 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 ten (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 administered by the Kentucky Infrastructure Authority.

SECTION 00410

BID FORM

Project Identification: Rio Verde Dam Improvements

Contract Identification and Number: N/A

ARTICLE 1 – BID RECIPIENT

- 1.01 This Bid Is Submitted To: Green River Valley Water District, 85 E. Les Turner Road, Cave City, KY 42127
- 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 became 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 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Note: Bids shall include sales tax and all other applicable taxes.

BASE PROJECT - Construction Completion Time: 60 days

Item No.	Item	Unit	Quantity	Unit Price	Item Price
1	Mobilization/Demobilization	LS	1	_____	_____
2	General Conditions	LS	1	_____	_____
3	Cleaning and Grubbing	LS	1	_____	_____
4	Erosion Control	LS	1	_____	_____
5	Demo Outlet Box & Expose Foundations	LS	1	_____	_____
6	24" Intake Screen & Piping	LS	1	_____	_____
7	24" HDPE Stream Diversion Pipe	LF	920	_____	_____
8	Stream Diversion Structure	LS	1	_____	_____
9	Diversion Pipe Connection to Existing Raw Water Mains	LS	1	_____	_____
10	4" Blowoff Assembly	LS	1	_____	_____
11	Concrete Splash-Pad at Toe of Dam	CY	20	_____	_____
12	Rip-Rap Channel Lining	TN	30	_____	_____
13	Pipe Anti-Seep Collar	LS	1	_____	_____
14	Revegetation	LS	1	_____	_____
15	Grout Mix Design Testing	LS	1	_____	_____
16	Drill Setup	EA	38	_____	_____
17	Grout Hole Drilling – Overburden Drilling and Standpipe Installation	LF	200	_____	_____
18	Grout Hole Drilling – Core Drilling	LF	360	_____	_____
19	Grout Hole Drilling – Rotary Percussive Drilling	LF	893	_____	_____

(continued next page)

20	Grout Hole Washing	HR	12	_____	_____
21	Water Pressure Testing	HR	23	_____	_____
22	Grouting Connections	EA	38	_____	_____
23	Placing Grout	HR	43	_____	_____
24	Cement for Grouting	BAG	1080	_____	_____

Total Base Project

\$ _____

- A. Unit Prices have been computed in accordance with paragraph 11.03.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 Time.

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. Certification Regarding Lobbying;
 - C. Certification Regarding Debarment, Suspension and Other Responsibility Matters;
 - D. Certification Regarding Equal Employment Opportunity;

ARTICLE 8 – DEFINED TERMS

- 8.01 The terms used in this Bid with the initial capital 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): _____

By: _____
(Individual's signature)

Doing business as: _____

Bidders 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 _____, 20__.

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): Green River Valley Water District
85 E. Les Turner Road
Cave City, Kentucky 42127

BID

Bid Due Date:

Project (Brief Description Including Location): Rio Verde Dam Improvements
Hart 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

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title

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

Attest: _____
Signature and Title

Attest: _____
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 REGARDING DEBARMENT,
SUSPENSION AND OTHER RESPONSIBILITY MATTERS**

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or Local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

Typed Name & Title of Authorized Representative

Signature of Authorized Representative

Date

_____ I am unable to certify to the above statements. My explanation is attached.

CERTIFICATION REGARDING LOBBYING
Certification for Contracts, Grants,
Loans, and Cooperative Agreements

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 an 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, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (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, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients 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.

Typed Name & Title of Authorized Representative

Signature of Authorized Representative

Date

_____ I am unable to certify to the above statements. My explanation is attached.

CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT OPPORTUNITY

CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT OPPORTUNITY	
Instructions	
This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The Implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause, and if so, whether it has filed all compliance reports due under applicable instructions. Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.	
Certification by Bidder	
Name and Address of Bidder (include zip code)	
1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.	Yes No
2. Compliance reports were required to be filled in connection with such contract or subcontract.	Yes No
3. Bidder has filed all compliance reports due under applicable instructions, including Monthly Employment Utilization Report (257)	Yes No None Required
4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended?	Yes No
Name and Title of Signer (please type)	
Signature	Date

**SECTION 00510
NOTICE OF AWARD**

To: _____

PROJECT
Description: _____

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, 2013 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.

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

Dated this ____ day of _____, 2013.

Green River Valley Water District
Owner

By: _____

Title: Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____ this the ____ day of _____, 2013.

By: _____

Title: _____

accordance with Article 12 of the General Conditions. Accordingly, Contractor shall pay Owner \$500 for each day that expires after the time specified in Paragraph 4.02 until the Work is substantially complete. After Substantial Completion, retainage shall be reduced to an amount agreed upon by Owner, Contractor and Engineer. It should be no less than 150% of the amount required for the completion and ready for final payment. Liquidated damages may not be assessed after substantial completion has been achieved.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A, below:

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

ARTICLE 6 – PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

A. Contractor shall submit Applications for Payment in accordance with Article 14 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 Paragraphs 6.02.A.1 and 6.02.A.2 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of 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 in the General Requirements:

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 Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions:
 - 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).
2. Upon Substantial Completion, 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 receipt of the final Application for Payment accompanied by Engineer's recommendation of payment in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay Contractor as provided in Paragraph 14.07 of the General Conditions the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages.

ARTICLE 7 – INTEREST

7.01 All moneys not paid when due as provided in Article 14 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 Agreement Contractor makes the following representations:

- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
- B. Contractor 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. Contractor 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. Contractor has obtained and carefully studied (or assumes responsibility for doing so) all 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 Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.
- E. Contractor does not consider that any 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 Documents.
- F. 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.
- G. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with 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.

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 (pages ____ to ____, inclusive).
 - a. ____ (pages ____ to ____, inclusive).
 - b. ____ (pages ____ to ____, inclusive).
 - c. ____ (pages ____ to ____, inclusive).
 5. General Conditions (pages 1 to 57, inclusive).
 6. Supplementary Conditions (pages 1 to 3, inclusive).
 7. Specifications as listed in the table of contents of the Project Manual.
 8. Drawings with each sheet bearing the following general title: Rio Verde Dam Improvements.
 9. Addenda (numbers ____ to ____, inclusive).
 10. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages 1 to 5, inclusive).
 - b. Documentation submitted by Contractor prior to Notice of Award (pages ____ to ____, inclusive).
 - c. _____.
 11. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed (pages 1 to 1, inclusive).
 - b. Work Change Directives.
 - c. Change Order(s).
- 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 3.04 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. 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, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect 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.

- continued on next page -

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 Engineer on their behalf.

This Agreement is dated _____. This Agreement shall not be effective unless and until Agency's designated representative concurs.

OWNER: Green River Valley Water District

CONTRACTOR: _____

By: _____

By: _____

Title: Chairman

Title: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest: _____

Attest: _____

Title: Manager

Title: _____

Address for giving notices:

Address for giving notices:

85 E. Les Turner Road

Cave City, Kentucky 42127

Agent for service of process:

(If Contractor is a corporation or a partnership, 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: _____

By: _____

Date: _____

Title: _____

NOTICE TO PROCEED

TO: _____ DATE: _____

Project: Rio Verde Dam

Improvements

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 2013, on or before _____, 2013, and you are to complete the WORK within 60 consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 2013.

Green River Valley Water District
Owner

By _____
Title Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED

is hereby acknowledged by _____ this the ____
day of ____, 2013.

By _____

Title _____

Employer Identification
Number _____

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):

Green River Valley Water District
85 E. Les Turner Road
Cave City, Kentucky 42127

CONTRACT

Date:

Amount:

Description (Name and Location):

Rio Verde Dam Improvements
Hart 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

SURETY

Company:

Signature: _____ (Seal)

Name and Title:

(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

SURETY

Company:

Signature: _____ (Seal)

Name and Title:

(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.

00610-1

F:\PROJECTS\2012\2012123\SPECIFICATIONS\Front End Specs\Sec00610-PerformanceBond.doc

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 Representative (engineer or other party)

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):

Green River Valley Water District
85 E. Les Turner Road
Cave City, Kentucky 42127

CONTRACT

Date:

Amount:

Description (Name and Location):

Rio Verde Dam Improvements
Hart 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

SURETY

Company:

Signature: _____ (Seal)
Name and Title:

Surety's Name and Corporate Seal (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

SURETY

Company:

Signature: _____ (Seal)
Name and Title:

Surety's Name and Corporate Seal (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.

00615-1

F:\PROJECTS\2012\2012123\SPECIFICATIONS\Front End Specs\Sec00615-PaymentBond.doc

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):

Certificate of Substantial Completion

Project: Rio Verde Dam Improvements	Owner: Green River Valley Water District	Owner's Contract No.:
Contract: Rio Verde Dam Improvements		Date of Contract:
Contractor:		Engineer's Project No.: 2012123

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 Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT FUNDING AGENCY EDITION

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By



PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN COUNCIL OF ENGINEERING COMPANIES

AMERICAN SOCIETY OF CIVIL ENGINEERS

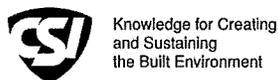
This document has been approved and endorsed by

The Associated General Contractors of America



and the

Construction Specification Institute



These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Funding Agency Edition No. C-521 (2002 Edition). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001, 2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800, 2002 Edition).

Copyright © 2002 National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314-2794
(703) 684-2882

American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
(202) 347-7474

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400
(800) 548-2723

TABLE OF CONTENTS

	Page
Article 1 – Definitions and Terminology.....	6
1.01 Defined Terms.....	6
1.02 Terminology.....	9
Article 2 – Preliminary Matters	10
2.01 Delivery of Bonds and Evidence of Insurance	10
2.02 Copies of Documents	10
2.03 Commencement of Contract Times; Notice to Proceed	10
2.04 Starting the Work	11
2.05 Before Starting Construction	11
2.06 Preconstruction Conference	11
2.07 Initial Acceptance of Schedules	11
Article 3 – Contract Documents: Intent, Amending, Reuse	11
3.01 Intent.....	11
3.02 Reference Standards.....	12
3.03 Reporting and Resolving Discrepancies	12
3.04 Amending and Supplementing Contract Documents.....	13
3.05 Reuse of Documents	13
3.06 Electronic Data.....	13
Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points.....	13
4.01 Availability of Lands.....	13
4.02 Subsurface and Physical Conditions.....	14
4.03 Differing Subsurface or Physical Conditions.....	14
4.04 Underground Facilities.....	15
4.05 Reference Points.....	16
4.06 Hazardous Environmental Condition at Site	16
Article 5 – Bonds and Insurance.....	18
5.01 Performance, Payment, and Other Bonds.....	18
5.02 Licensed Sureties and Insurers.....	18
5.03 Certificates of Insurance.....	18
5.04 Contractor’s Liability Insurance	18
5.05 Owner’s Liability Insurance.....	19
5.06 Property Insurance	20
5.07 Waiver of Rights	21
5.08 Receipt and Application of Insurance Proceeds.....	21
5.09 Acceptance of Bonds and Insurance; Option to Replace	21
5.10 Partial Utilization, Acknowledgment of Property Insurer	22
Article 6 – Contractor’s Responsibilities	22
6.01 Supervision and Superintendence	22
6.02 Labor; Working Hours.....	22
6.03 Services, Materials, and Equipment.....	22
6.04 Progress Schedule	23
6.05 Substitutes and “Or-Equals”	23
6.06 Concerning Subcontractors, Suppliers, and Others	25
6.07 Patent Fees and Royalties.....	26
6.08 Permits.....	26
6.09 Laws and Regulations	26
6.10 Taxes	27

6.11	Use of Site and Other Areas.....	27
6.12	Record Documents.....	27
6.13	Safety and Protection.....	28
6.14	Safety Representative.....	28
6.15	Hazard Communication Programs.....	28
6.16	Emergencies.....	28
6.17	Shop Drawings and Samples.....	29
6.18	Continuing the Work.....	30
6.19	Contractor's General Warranty and Guarantee.....	30
6.20	Indemnification.....	31
6.21	Delegation of Professional Design Services.....	31
Article 7 – Other Work at the Site.....		32
7.01	Related Work at Site.....	32
7.02	Coordination.....	32
7.03	Legal Relationships.....	33
Article 8 – Owner's Responsibilities.....		33
8.01	Communications to Contractor.....	33
8.02	Replacement of Engineer.....	33
8.03	Furnish Data.....	33
8.04	Pay When Due.....	33
8.05	Lands and Easements; Reports and Tests.....	33
8.06	Insurance.....	33
8.07	Change Orders.....	33
8.08	Inspections, Tests, and Approvals.....	33
8.09	Limitations on Owner's Responsibilities.....	34
8.10	Undisclosed Hazardous Environmental Condition.....	34
8.11	Evidence of Financial Arrangements.....	34
Article 9 – Engineer's Status During Construction.....		34
9.01	Owner's Representative.....	34
9.02	Visits to Site.....	34
9.03	Project Representative.....	34
9.04	Authorized Variations in Work.....	35
9.05	Rejecting Defective Work.....	35
9.06	Shop Drawings, Change Orders and Payments.....	35
9.07	Determinations for Unit Price Work.....	35
9.08	Decisions on Requirements of Contract Documents and Acceptability of Work.....	35
9.09	Limitations on Engineer's Authority and Responsibilities.....	36
Article 10 – Changes in the Work; Claims.....		36
10.01	Authorized Changes in the Work.....	36
10.02	Unauthorized Changes in the Work.....	36
10.03	Execution of Change Orders.....	37
10.04	Notification to Surety.....	37
10.05	Claims.....	37
Article 11 – Cost of the Work; Allowances; Unit Price Work.....		38
11.01	Cost of the Work.....	38
11.02	Allowances.....	40
11.03	Unit Price Work.....	40
Article 12 – Change of Contract Price; Change of Contract Times.....		41
12.01	Change of Contract Price.....	41
12.02	Change of Contract Times.....	42

12.03	Delays	42
Article 13	– Tests and Inspections; Correction, Removal or Acceptance of Defective Work	43
13.01	Notice of Defects.....	43
13.02	Access to Work	43
13.03	Tests and Inspections	43
13.04	Uncovering Work.....	43
13.05	Owner May Stop the Work	44
13.06	Correction or Removal of Defective Work	44
13.07	Correction Period	44
13.08	Acceptance of Defective Work.....	45
13.09	Owner May Correct Defective Work.....	45
Article 14	– Payments to Contractor and Completion.....	46
14.01	Schedule of Values.....	46
14.02	Progress Payments	46
14.03	Contractor’s Warranty of Title.....	48
14.04	Substantial Completion	48
14.05	Partial Utilization	49
14.06	Final Inspection	49
14.07	Final Payment.....	49
14.08	Final Completion Delayed	50
14.09	Waiver of Claims	51
Article 15	– Suspension of Work and Termination	51
15.01	Owner May Suspend Work.....	51
15.02	Owner May Terminate for Cause.....	51
15.03	Owner May Terminate For Convenience	52
15.04	Contractor May Stop Work or Terminate.....	52
Article 16	– Dispute Resolution.....	53
16.01	Methods and Procedures.....	53
Article 17	– Miscellaneous	53
17.01	Giving Notice	53
17.02	Computation of Times.....	53
17.03	Cumulative Remedies	53
17.04	Survival of Obligations	54
17.05	Controlling Law	54
17.06	Headings.....	54
Article 18	– Federal Requirements	54
18.01	Agency Not a Party	54
18.02	Contract Approval.....	54
18.03	Conflict of Interest	54
18.04	Gratuities	54
18.05	Audit and Access to Records	55
18.06	Small, Minority and Women’s Businesses	55
18.07	Anti-Kickback	55
18.08	Clean Air and Pollution Control Acts	55
18.09	State Energy Policy	55
18.10	Equal Opportunity Requirements.....	55
18.11	Restrictions on Lobbying	56
18.12	Environmental Requirements.....	56

GENERAL CONDITIONS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda* – Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agency* – The Federal or state agency named as such in the Agreement.
 3. *Agreement* – The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 4. *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.
 5. *Asbestos* – Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 6. *Bid* – The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 7. *Bidder* – The individual or entity who submits a Bid directly to Owner.
 8. *Bidding Documents* – The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 9. *Bidding Requirements* – The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.
 10. *Change Order* – A document recommended by Engineer which is signed by Contractor and Owner and Agency and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 11. *Claim* – A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 12. *Contract* – The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
 13. *Contract Documents* – Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

14. *Contract Price* – The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
15. *Contract Times* – The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
16. *Contractor* – The individual or entity with whom Owner has entered into the Agreement.
17. *Cost of the Work* – See Paragraph 11.01.A for definition.
18. *Drawings* – That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
19. *Effective Date of the Agreement* – The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
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 which does not involve a change in the Contract Price or the Contract Times.
22. *General Requirements* – Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.
23. *Hazardous Environmental Condition* – The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.
24. *Hazardous Waste* – The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
25. *Laws and Regulations; Laws or Regulations* – Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens* – Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
27. *Milestone* – A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
28. *Notice of Award* – The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
29. *Notice to Proceed* – A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
30. *Owner* – The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
31. *PCBs* – Polychlorinated biphenyls.

32. *Petroleum* – Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
33. *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.
34. *Project* – The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
35. *Project Manual* – The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
36. *Radioactive Material* – Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
37. *Related Entity* – An officer, director, partner, employee, agent, consultant, or subcontractor.
38. *Resident Project Representative* – The authorized representative of Engineer who may be assigned to the Site or any part thereof.
39. *Samples* – Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
40. *Schedule of Submittals* – A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
41. *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.
42. *Shop Drawings* – All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
43. *Site* – Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
44. *Specifications* – That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
45. *Subcontractor* – An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
46. *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.
47. *Successful Bidder* – The Bidder submitting a responsive Bid to whom Owner makes an award.

48. *Supplementary Conditions* – That part of the Contract Documents which amends or supplements these General Conditions.
49. *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 any Subcontractor.
50. *Underground Facilities* – All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
51. *Unit Price Work* – Work to be paid for on the basis of unit prices.
52. *Work* – The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
53. *Work Change Directive* – A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and Agency upon recommendation of the Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

- A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following 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 requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.
- C. *Day*
 1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*

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

E. *Furnish, Install, Perform, Provide*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

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

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement.

2.04 *Starting the Work*

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

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
1. a preliminary Progress Schedule;
 2. a preliminary Schedule of Submittals; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, Agency, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage

as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. *Standards, Specifications, Codes, Laws, and Regulations*

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

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

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

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or
 - 2. reuse any of 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 adaption by Engineer.
- B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

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

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

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any,

of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and
 - 2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

- A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:
 - 1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
 - 2. is of such a nature as to require a change in the Contract Documents; or
 - 3. differs materially from that shown or indicated in the Contract Documents; or
 - 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb

such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

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

C. *Possible Price and Times Adjustments*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

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

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data,
 - b. locating all Underground Facilities shown or indicated in the Contract Documents,

- c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and
- d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

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

4.05 *Reference Points*

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

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

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

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

- A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
 2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
 3. include completed operations insurance;
 4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
 5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
 6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
 7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.
 - a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (Contractor shall be responsible for any deductible or self-insured retention.). This insurance shall:
1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;
 2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.
- B. Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, 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 Contractor as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:
1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

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

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

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of

non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

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

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 - 1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times, and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
 - b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
 - c. The procedure requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.
 - d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) will perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;
 - b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified , and
 - b) available engineering, sales, maintenance, repair, and replacement services;
 - 4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor
 - 2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

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

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain

that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

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

6.11 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

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

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

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

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved

Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or , 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).
- D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

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

6.15 *Hazard Communication Programs*

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

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract

Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

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

C. *Submittal Procedures*

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:
 - a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;
 - c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and
 - d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures*

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

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
4. use or occupancy of the Work or any part thereof by Owner;
5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
6. any inspection, test, or approval by others; or
7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:
 1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

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

7.02 *Coordination*

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

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

7.03 *Legal Relationships*

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

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

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

8.02 *Replacement of Engineer*

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

8.03 *Furnish Data*

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

8.04 *Pay When Due*

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

8.05 *Lands and Easements; Reports and Tests*

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

8.06 *Insurance*

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

8.07 *Change Orders*

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

8.08 *Inspections, Tests, and Approvals*

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

8.09 *Limitations on Owner's Responsibilities*

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

8.10 *Undisclosed Hazardous Environmental Condition*

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

8.11 *Evidence of Financial Arrangements*

- A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

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

9.05 *Rejecting Defective Work*

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

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, subject to written approval by Agency at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If notice 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) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part,
 2. approve the Claim, or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

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

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.
 - 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 at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 - 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 - 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
 - 4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
 - 5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressages, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

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

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

- C. Contractor's Fee: When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. Cash Allowances
 - 1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*
 - 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
1. the Bid price of a particular item of Unit Price Work amounts to more than 5 percent of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

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

- e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

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

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.B.
 - 1. delays caused by or within the control of Contractor; or
- D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

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

13.01 *Notice of Defects*

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

13.02 *Access to Work*

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

13.03 *Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. repair such defective land or areas; or
 - 2. correct such defective Work; or
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site 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, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
 3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due

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

D. *Reduction in Payment*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. the Contractor's performance or furnishing of the Work is inconsistent with funding Agency requirements;
 - d. there are other items entitling Owner to a set-off against the amount recommended; or
 - e. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.
3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 *Contractor's Warranty of Title*

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

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Agency, Contractor, and Engineer shall make a prefinal inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.
 - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

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

14.07 *Final Payment*

A. *Application for Payment*

- 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. Engineer's Review of Application and Acceptance

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

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

14.08 *Final Completion Delayed*

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

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),
 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by

Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

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

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 - 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

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

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

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

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

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

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

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

ARTICLE 18 – FEDERAL REQUIREMENTS

18.01 *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.

18.02 *Contract Approval*

- A. Owner and Contractor will furnish Owner's attorney such evidence as required so that Owner's attorney can complete and execute the following "Certificate of Owner's Attorney" (Exhibit GC-A) before Owner submits the executed Contract Documents to Agency for approval.
- B. Concurrence by Agency in the award of the Contract is required before the Contract is effective.

18.03 *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.
- B. 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 is 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 subcontractors.

18.04 *Gratuities*

- A. If Owner finds after a notice and hearing that Contractor, or any of 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 18.04.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of this 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

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.

18.05 *Audit and Access to Records*

- A. For all negotiated contracts and negotiated modifications (except those of \$10,000 or less), Owner, Agency, the Comptroller General, 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 Contract, for the purpose of making audits, examinations, excerpts and transcriptions. Contractor shall maintain all required records for three years after final payment is made and all other pending matters are closed.

18.06 *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; (4) establishing delivery schedules, where the requirements of the work permit, which will encourage participation by 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 U.S. 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 services from labor surplus area firms.

18.07 *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 Part 3, "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.

18.08 *Clean Air and Pollution Control Acts*

- A. If this Contract exceeds \$100,000, Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 USC 7401 *et seq.*) and the Federal Water Pollution Control Act as amended (33 USC 1251 *et seq.*). Contractor will report violations to the Agency and the Regional Office of the EPA.

18.09 *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 efficiency, contained in any applicable State Energy Conservation Plan, shall be utilized.

18.10 *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 at 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 active obligations required by the Standard Federal Equal Employment

Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 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 Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the Contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the Contract is to be performed.

18.11 *Restrictions on 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 to the recipients of contracts and subcontracts that exceed \$100,000 at any tier under a 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 a 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.

18.12 *Environmental Requirements*

- A. When constructing a project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental constraints:
1. Wetlands – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
 2. Floodplains – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100 year floodplain areas delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, i.e., alluvial soils on NRCS Soil Survey Maps.
 3. Historic Preservation – Any excavation by Contractor that uncovers an historical or archaeological artifact shall be immediately reported to 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).
 4. 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 threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to 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 U.S. Fish and Wildlife Service.

EXHIBIT GC-A

Certificate of Owner's Attorney

I, the undersigned, _____, the duly authorized and acting legal representative of _____, do hereby certify as follows:

I have examined the attached Contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements is adequate and has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions, and provisions thereof.

Date: _____

Section 00800 Supplementary Conditions

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract Funding Agency Edition (No. C-710, 2002 Edition) and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

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

TABLE OF CONTENTS

		Page
SC-1.01.A.2	Project Financing	1
SC-1.01.A.4	Application for Payment	1
SC-1.01.A.10	Change Order	1
SC-1.01.A.15	Contract Times	1
SC-2.03.A	Commencement of Contract Times; Notice to Proceed	1
SC-4.02	Subsurface and Physical Conditions	2
SC-4.06	Hazardous Environmental Condition at Site	2
SC-5.03	Certificates of Insurance	2
SC-5.04	Contractor's Liability Insurance	2
SC-6.06	Concerning Subcontractors, Suppliers, and Others	3
SC-9.03	Project Representative	3
SC-14.02.A.3	Applications for Payment	3
SC-14.02.C.1	Payment Becomes Due	3
SC-18.08	Clean Air and Pollution Control Acts	3

SC-1.01.A.2. Add the following language to the end of Paragraph 1.01.A.2:

The Project is financed in whole or in part by Kentucky Infrastructure Authority (KIA) Fund B.

SC-1.01.A.4. Add the following language to the end of Paragraph 1.01.A.4:

The Application for Payment form to be used on this Project is Form RD 1924-18. The Agency must approve all Applications for Payment before payment is made.

SC-1.01.A.10. Add the following language to the end of Paragraph 1.01.A.10:

The Change Order form to be used on this Project is Form RD 1927-7. Agency approval is required before Change Orders are effective.

SC-1.01.A.15. Delete in it's entirety and replace with the following:

Contract Times: The number of days or date stated in the Agreement to achieve substantial completion. Final completion date will be determined by Contractor, Owner and Engineer, after substantial completion, based on remaining work, weather and market conditions.

SC-2.03.A. Delete Paragraph 2.03.A in its entirety and insert the following in its place:

- A. The Contract Times will commence to run on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 10 days after the Effective Date of the Agreement.

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

- A. No reports or explorations or tests of subsurface conditions at or contiguous to the Site are known to the Owner or Engineer.

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

- A. No reports or explorations or tests of subsurface conditions at or contiguous to the Site are known to the Owner or Engineer.
- B. Not used.

SC-5.03. Add the following new paragraph immediately after Paragraph 5.03.B:

- 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-5.04. Add the following new paragraph immediately after Paragraph 5.04.B:

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

- 1. Workers' Compensation, and related coverages under Paragraphs 5.04.A.1 and A.2 of the General Conditions:

- a. State: Statutory
- b. Applicable Federal (e.g., Longshoremen's) Statutory
- c. Employer's Liability \$ 500,000

- 2. Contractor's General Liability under Paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of 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 5.04.A.6 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-6.06 Add a new paragraph immediately after Paragraph 6.06.G:

- H. The Contractor shall not award work valued at more than fifty (50%) percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.

SC-9.03.A. Add the following language at the end of paragraph 9.03.A:

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-510, 2002 Edition, as amended and executed for this specific Project.

SC-14.02.A.3 Add the following language at the end of paragraph 14.02.A.3:

No payments will be made that would deplete the retainage prior to substantial completion, nor place in escrow any funds that are required for retainage, or invest the retainage for benefit.

SC-14.02.C.1. Delete Paragraph 14.02.C.1 in its entirety and insert the following in its place:

1. The Application for Payment with Engineer's recommendations 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 14.02.D will become due ten days after the Application for Payment is presented to the Owner, and the Owner will make payment to the Contractor.

SC-18.08 Delete paragraph 18.08.A in its entirety and insert the following in its place:

- A. If this Contract exceeds \$100,000, the Contractor shall comply with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act (42 USC §1857(h)), Section 508 of the Clean Water Act (33 USC §1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15).



Steven L. Beshear
Governor

KENTUCKY LABOR CABINET
DEPARTMENT OF WORKPLACE STANDARDS
DIVISION OF EMPLOYMENT STANDARDS,
APPRENTICESHIP & MEDIATION
1047 US Hwy 127 S - Suite 4
Frankfort, Kentucky 40601
Phone: (502) 564-3534
Fax (502) 696-1897
www.labor.ky.gov

Larry Roberts
Secretary

Anthony Russell
Commissioner

August 15, 2013

Matt Waldner
Kenvirons Inc.
452 Versailles Rd.
Frankfort KY 40601

Re: Green River Valley Water District, Rio Verde Dam Improvements

Advertising Date as Shown on Notification: August 15, 2013

Dear Matt Waldner:

This office is in receipt of your written notification on the above project as required by KRS 337.510 (1).

I am enclosing a copy of the current prevailing wage determination number CR 8-005, dated February 27, 2013 for HART County. This schedule of wages shall be attached to and made a part of the specifications for the work, printed on the bidding blanks, and made a part of the contract for the construction of the public works between the public authority and the successful bidder or bidders.

The determination number assigned to this project is based upon the advertising date contained in your notification. There may be modifications to this wage determination prior to the advertising date indicated. In addition, if the contract is not awarded within 90 days of this advertising date or if the advertising date is modified, a different set of prevailing rates of wages may be applicable. It will be the responsibility of the public authority to contact this office and verify the correct schedule of the prevailing rates of wages for use on the project. Your project number is as follows: 050-H-00061-13-8, Heavy/Highway

Sincerely,

Anthony Russell
Commissioner



KENTUCKY LABOR CABINET
PREVAILING WAGE DETERMINATION
CURRENT REVISION
LOCALITY NO. 005

Determination No. CR 8-005

Date of Determination: February 27, 2013

Project No. 050-H-00061-13-8

_____ Bldg __xx__ HH

This schedule of the prevailing rate of wages for Locality No. 005, which includes Breckinridge, Grayson, Hancock, Hart, Larue, and Meade Counties, has been determined in accordance with the provisions of KRS 337.505 to 337.550. This determination shall be referred to as Prevailing Wage Determination No. CR 8-005.

Apprentices shall be permitted to work as such subject to Administrative Regulations adopted by the Executive Director of the Office of Workplace Standards. Copies of these regulations will be furnished upon request to any interested person.

Overtime is to be computed at not less than one and one-half (1 1/2) times the indicated BASE RATE for all hours worked in excess of eight (8) per day, or in excess of forty (40) per week. However, KRS 337.540 permits an employee and employer to agree, in writing, that the employee will be compensated at a straight time base rate for hours worked in excess of eight (8) hours in any one workday, but not more than ten (10) hours worked in any one workday, if such written agreement is prior to the over eight (8) hours in a workday actually being worked, or where provided for in a collective bargaining agreement. The fringe benefit rate is to be paid for each hour worked at a straight time rate for all hours worked.

No laborer, workman or mechanic shall be paid at a rate less than that of the General Laborer except those classified as bona fide apprentices registered with the Kentucky State Apprenticeship Supervisor unless otherwise specified in this schedule of wage rates.

Fringe benefit amounts are applicable for all hours worked except when otherwise noted.

WELDERS - Receive rate for craft in which welding is incidental.

NOTE: The type of construction shall be determined by applying the following definitions.

BUILDING CONSTRUCTION

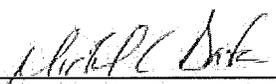
Building construction is the construction of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment, or supplies. It includes all construction of such structures, the installation of utilities and the installation of equipment, both above and below grade level, as well as incidental grading, utilities and paving.

HIGHWAY CONSTRUCTION

Highway construction includes the construction, alteration or repair of roads, streets, highways, runways, taxiways, alleys, trails, paths, parking areas, and other similar projects not incidental to building or heavy construction. It includes all incidental construction in conjunction with the highway construction project.

HEAVY CONSTRUCTION

Heavy projects are those projects that are not properly classified as either "building" or "highway". For example, dredging projects, water and sewer line projects, dams, flood control projects, sewage treatment plants and facilities, and water treatment plants and facilities are considered heavy.



Michael Donta, Deputy Commissioner
DEPARTMENT OF WORKPLACE STANDARDS
KENTUCKY LABOR CABINET

ASBESTOS / INSULATION WORKERS:

	BASE RATE	\$24.67
	FRINGE BENEFITS	11.51

BOILERMAKERS:

	BASE RATE	\$34.56
	FRINGE BENEFITS	23.99

BRICKLAYERS:

Bricklayers	BASE RATE	\$24.11
	FRINGE BENEFITS	10.30

Refractory	BASE RATE	\$24.61
	FRINGE BENEFITS	10.30

CARPENTERS:

Carpenters	BUILDING	*BASE RATE	\$22.13
		FRINGE BENEFITS	13.95

Piledrivermen	BUILDING	BASE RATE	\$23.13
		FRINGE BENEFITS	13.95

*When working in excess of 30 ft. to 100 ft. above ground or solid floor on scaffold, skip hoist, tower, or slipform, on suspended or swinging scaffold, – add \$0.25 to base rate. When working with creosote, lead or lead paint or other injurious materials– add \$0.25 to base rate. When working in excess of 100 ft. above ground or solid floor on scaffold, skip hoist, tower, or slipform – add \$0.50 to base rate.

Carpenters	HEAVY & HIGHWAY	BASE RATE	\$26.40
		FRINGE BENEFITS	13.95

Piledrivermen	HEAVY & HIGHWAY	BASE RATE	\$26.65
		FRINGE BENEFITS	13.95

Divers	HEAVY & HIGHWAY	BASE RATE	\$39.98
		FRINGE BENEFITS	13.95

CEMENT MASONS:

	BASE RATE	\$23.80
	FRINGE BENEFITS	12.85

ELECTRICIANS:

	BASE RATE	\$29.32
	FRINGE BENEFITS	13.98

LINEMEN:	HEAVY & HIGHWAY	BASE RATE	\$31.86
		FRINGE BENEFITS	11.63

EQUIPMENT OPERATOR:	HEAVY & HIGHWAY	BASE RATE	\$28.48
		FRINGE BENEFITS	10.94

GROUND MEN:	HEAVY & HIGHWAY	BASE RATE	\$18.87
		FRINGE BENEFITS	9.03

ELEVATOR CONSTRUCTORS:	BASE RATE	\$20.725
	FRINGE BENEFITS	6.12

GLAZIERS:	*BASE RATE	\$18.41
	FRINGE BENEFITS	3.88

*Add \$.35 for glaziers working on a scaffold 30 ft. or more above ground or any permanent part of a structure

IRONWORKERS:	BASE RATE	\$26.34
	FRINGE BENEFITS	18.84

LABORERS / BUILDING:

GROUP 1: General laborers, watchman, water boy, wrecking labor on building and structures, clearing right-of-way and building site, carpenter tender, deck hand, flagging traffic, truck spotters and dumper, axe and cross cut saw filer, concrete puddlers and form strippers, asbestos abatement laborers, toxic waste removal laborer, lead abatement laborers, and industrial deep cleaning:

BUILDING	BASE RATE	\$20.85
	FRINGE BENEFITS	10.23

GROUP 2: All power driven tools, hod carriers, mason tenders, finishing tenders, mortar mixers, jack hammer, vibrators, soil compactors, wagon drill, core drill, test drill, well drill, concrete pump machine, tunnel boring machine, men in tunnel and crib ditch work, signal man, riprap rock setters and handlers, asphalt rakers, tampers and smoothers, pipe layers, grout pump man, chain saw, pipe clearing, doping and wrapping, swampers and straight cable hooking, cement guns, grade checkers machine excavating, tool room checkers, batch plant scale man, sand hog free air, sand hog compressed air, cutting torch man on salvage work, road form setters, brick slingers, hand spikers, power buggy, handling of creosote material, sandblasters, curing of concrete and apply hardner, air and gas tampers, concrete saw, power post hole diggers and green cut men on concrete work, request that two men be used on pavement breakers, multi-craft tender:

BUILDING	BASE RATE	\$21.05
	FRINGE BENEFITS	10.23

Group 3: Powderman or Blasters:

BUILDING	BASE RATE	\$22.05
	FRINGE BENEFITS	10.23

LABORERS / HEAVY & HIGHWAY:

GROUP 1: Aging and curing of concrete (any mode or method), asbestos abatement worker, asphalt plant laborers, asphalt laborers, batch truck dumpers, carpenter tenders, cement mason tenders, cleaning of machines, concrete laborers, demolition laborers, dredging laborers, drill helper, environmental laborer - nuclear, radiation, toxic and hazardous waste - Level D, flagmen, grade checkers, all hand digging and hand back filling, highway marker placers, landscaping laborers, mesh handlers and placers, puddler, railroad laborers, rip-rap and grouters, right of way laborers, sign, guard rail and fence installers (all types), signal men, sound barrier installer, storm and sanitary sewer laborers, swampers, truck spotters and dumpers, and wrecking of concrete forms and general cleanup:

HEAVY & HIGHWAY	BASE RATE	\$21.51
	FRINGE BENEFITS	10.15

LABORERS / HEAVY & HIGHWAY: CONTINUED

GROUP 2: Batter board men (sanitary and storm sewer), brickmason tenders, mortar mixer operator, scaffold builders, burner and welder, bushhammers, chain saw operator, concrete saw operators, deckhand scow man, dry cement handlers, environmental laborers - nuclear, radiation, toxic and hazardous waste - Level C, forklift operators for masonry, form setters, green concrete cutting, hand operated grouter and grinder machine operator, jack hammers, lead paint abatement, pavement breakers, paving joint machine, pipe layers-laser operators (non-metallic), plastic pipe fusion, power driven Georgia buggy or wheelbarrow, power post hole diggers, precast manhole setters, walk-behind tampers, walk-behind trenchers, sand blasters, concrete chippers, surface grinders, vibrator operators, wagon drillers:

HEAVY & HIGHWAY	BASE RATE	\$21.76
	FRINGE BENEFITS	10.15

GROUP 3: Asphalt luteman and rakers, gunnite nozzleleman, gunnite operators and mixers, grout pump operator, side rail setters, rail paved ditches, screw operators, tunnel laborers (free air), and water blasters:

HEAVY & HIGHWAY	BASE RATE	\$21.81
	FRINGE BENEFITS	10.15

GROUP 4: Caisson workers (free air), cement finishers, environmental laborer - nuclear, radiation, toxic and hazardous waste - Levels A and B, miners and drillers (free air), tunnel blasters, and tunnel muckers (free air), directional and horizontal boring, air track driller (all types), powderman and blaster, troxier and concrete tester if laborer is utilized:

HEAVY & HIGHWAY	BASE RATE	\$22.41
	FRINGE BENEFITS	10.15

MARBLE, TILE & TERRAZZO SETTERS:

BASE RATE	\$22.64
FRINGE BENEFITS	6.10

MARBLE, TILE & TERRAZZO FINISHERS:

BASE RATE	\$15.42
FRINGE BENEFITS	5.42

MILLWRIGHTS:

BASE RATE	\$24.28
FRINGE BENEFITS	17.26

OPERATING ENGINEERS / BUILDING:

CLASS A-1: Operating Engineers possessing 3rd party certification NCCCO (National Commission for the Certification of Crane Operators) (or Operating Engineers Certification Program) shall be paid the minimum rate per hour on the following equipment: Crane, dragline, hoist (1 drum when used for stack or chimney construction or repair), hoisting engineer (2 or more drums), orangepeel bucket, overhead crane, piledriver, truck crane, tower crane, hydraulic crane:

BUILDING	BASE RATE	\$27.28
	FRINGE BENEFITS	13.40

OPERATING ENGINEERS / BUILDING: CONTINUED

CLASS A: Articulating Dump, Auto Patrol, Batch Plant, Bituminous Paver, Cableway, Central Compressor Plant, Clamshell, Concrete Mixer (21 cu. ft. or over), Concrete Pump, Crane, Crusher Plant, Derrick, Derrick Boat, Directional boring machine, Ditching and Trenching Machine, Dragline, Dredge Operator, Dredge Engineer, Elevating Grader and all types of Loaders, Forklift (regardless of lift height), GPS systems (on equipment within the classification), Hoe-Type Machine, Hoist (1 drum when used for stack or chimney construction or repair), Hoisting Engine (2 or more drums), laser or remote controlled equipment (within the classification), Locomotive, Motor Scraper, Carry-all Scoop, Bulldozer, Heavy Duty Welder, Mechanic, Orangepeel Bucket, Piledriver, Power Blade, Motor Grader, Roller (bituminous), Scarifier, Shovel, Tractor Shovel, Truck Crane, Winch Truck, Push Dozer, Highlift, All types of Boom Cats, Core Drill, Hopto, Tow or Push Boat, A-Frame Winch Truck, Concrete Paver, Gradeall, Hoist, Hyster, Pumpcrete, Ross Carrier, Boom, Tail Boom, Rotary Drill, Hydro Hammer, Mucking Machine, Rock Spreader attached to equipment, Scoopmobile, KeCal Loader, Tower Cranes (French, German and other types), Hydrocrane, Backfiller, Gurries, sub-Grader, Tunnel Mining Machines including Moles, Shields, or Similar types of Tunnel Mining Equipment.

BUILDING	*BASE RATE	\$26.25
	FRINGE BENEFITS	13.40

*Operators on cranes with boom one-hundred fifty feet (150') and over including jib, shall receive seventy-five cents (\$.75) above base rate. All cranes with piling leads will receive \$.50 above base rate regardless of boom length

CLASS B: All Air Compressors (over 900 cfm), Bituminous Mixer, Joint Sealing Machine, Concrete Mixer (under 21 cu. ft), Form Grader, Roller (rock), tractor (50 HP and over), Bull Float, Finish Machine, Outboard Motor Boat, Flexplane, Fireman, Boom Type Tamping Machine, Greaser on Grease Facilities servicing Heavy Equipment, Switchman or brakeman, Mechanic Helper, Whirley Oiler, Self-Propelled Compactor, Tractair and Road Widening Trencher and Farm Tractor with Attachments (except backhoe, highlift and endloader), Elevator (regardless of ownership when used for hoisting any building materials), Hoisting Engineer (1 drum or buck hoist), Firebrick Masonry Excluded, Well Points, Grout Pump, Throttle-Valve Man, Tugger, Electric Vibrator Compactor and Caisson Drill Helper

BUILDING	BASE RATE	\$22.67
	FRINGE BENEFITS1	13.40

CLASS C: Bituminous Distributor, Cement Gun, Conveyor, Mud Jack, Paving Joint Machine, Roller (earth), Tamping Machine, Tractors (under 50 HP), Vibrator, Oiler, Concrete Saw, Burlap and Curing Machine, Truck Crane Oiler, Hydro-Seeder, Power Form handling Equipment, Deckhand Steersman, Hydraulic Post Driver and Drill Helper

BUILDING	BASE RATE	\$21.11
	FRINGE BENEFITS	13.40

OPERATING ENGINEERS / HEAVY HIGHWAY:

CLASS A-1: Operating Engineers possessing 3rd party certification NCCCO (National Commission for the Certification of Crane Operators) (or Operating Engineers Certification Program) shall be paid the minimum rate per hour on the following equipment: Cableway, carry deck crane, cherry picker, clamshell, crane, derrick, derrick boat, dragline, hoist engine (2 or more drums) hydraulic boom truck, hydrocrane, orangepeel bucket, overhead crane, piledriver, rough terrain crane, tower cranes (French, German & other types), truck crane:

HEAVY HIGHWAY	BASE RATE	\$28.40
	FRINGE BENEFITS	13.40

OPERATING ENGINEERS / HEAVY HIGHWAY: CONTINUED

CLASS A: A-Frame Winch Truck, Auto Patrol, Backfiller, Batch Plant, Bituminous Paver, Bituminous Transfer Machine, All types of Boom Cats, Bulldozer, Cableway, Carry-All Scoop, Carry Deck Crane, Central Compressor Plant Operator, Clamshell, Concrete Mixer (21 cu. ft. or over), Concrete Paver, Truck-Mounted Concrete Pump, Core Drills, Crane, Crusher Plant, Derrick, Derrick Boat, Ditching and Trenching Machine, Dragline, Dredge Operator, Dredge Engineer, Earth Movers, Elevating Grader and all types of Loaders, Grade-All, Gurries, Heavy Equipment Robotics Operator/Mechanic, Highlift, Hoe-Type Machine, Hoist (two or more drums), Hoisting Engine (two or more drums), Horizontal Directional Drill Operator, Hydraulic Boom Truck, Hydrocrane, Hyster, KeCal Loader, Letourneau, Locomotive, Mechanic, Mechanically Operated Laser Screed, Mechanic Welder, Mucking Machine, Motor Scraper, Orangepeel Bucket, Piledriver, Power Blade, Pumpcrete, Push Dozer, Rock Spreader attached to Equipment, All Rotary Drills, Roller (bituminous), Scarifier, Scoopmobile, Shovel, Side Boom, Subgrader, Tailboom, Telescoping Type Forklift, Tow or Push Boat, Tower Cranes (French, German and other types), Tractor Shovel, Truck Crane, Tunnel Mining Machines including Moles, Shields, or Similar types of Tunnel Mining Equipment.

HEAVY & HIGHWAY	**BASE RATE	\$27.35
	FRINGE BENEFITS	13.40

**Operators on cranes with booms one hundred fifty feet (150') and over including jib shall receive \$1.00 above base rate

CLASS B: All Air Compressors (over 900 cu. ft. per min.), Bituminous Mixer, Boom Type Tamping Machine, Bull Float, Concrete Mixer (under 21 cu. ft.), Electric Vibrator Compactor/Self-Propelled Compactor, Elevator (one drum or buck hoist), Elevator (regardless of ownership when used to hoist building material), Finish Machine, Firemen, Flex-Plane, Forklift (regardless of lift height), Form Grader, Hoist (one drum), Joint Sealing Machine, Mechanic Helper, Outboard Motor Boat, Power Sweeper (riding type), Roller (rock), Ross Carrier, Skid Mounted or Trailer Mounted Concrete Pumps, Switchman or Brakeman, Throttle Valve Man, Tractair and Road Widening Trencher, Tractor (50 HP and over), Truck Crane Oiler, Tugger, Welding Machine, Well Points, and Whirley Oiler.

HEAVY & HIGHWAY	BASE RATE	\$24.87
	FRINGE BENEFITS	13.40

CLASS B-2: Greaser on Grease Facilities servicing Heavy Equipment.

HEAVY & HIGHWAY	BASE RATE	\$25.26
	FRINGE BENEFITS	13.40

CLASS C: Bituminous Distributor, Burlap and Curing Machine, Caisson Drill and Core Drill Helper (track or skid mounted), Cement Gun, Concrete Saw, Conveyor, Deckhand Oiler, Grout Pump, Hydraulic Post Driver, Hydro Seeder, Mud Jack, Oiler, Paving Joint Machine, Power Form Handling Equipment, Pump, Roller (earth), Steermen, Tamping Machine, Tractors (under 50 H.P.) and Vibrator.

HEAVY & HIGHWAY	BASE RATE	\$24.60
	FRINGE BENEFITS	13.40

Employees assigned to work below ground level are to be paid ten percent (10%) above base wage rate. This does not apply to open cut work.

PAINTERS / BUILDING:

Brush, Roller & Paperhangers	BUILDING	*BASE RATE	\$24.45
		FRINGE BENEFITS	10.58

Drywall Finishers & Plasterers	BUILDING	*BASE RATE	\$24.70
		FRINGE BENEFITS	10.58

PAINTERS / BUILDING: CONTINUED

Spray, Sandblast, Power Tools, Waterblast, Steam Cleaning, Brush & Roller of Mastics, Creosotes, Kwinch Koate and Coal Tar Epoxy	BUILDING	*BASE RATE	\$25.45
		FRINGE BENEFITS	10.58
Spray of Mastics, Creosotes, Kwinch Koate and Coal Tar Epoxy	BUILDING	*BASE RATE	\$26.45
		FRINGE BENEFITS	10.58

*Add \$.75 per hour to base rate for employee working forty (40) feet or more above ground or floor -- \$1.50 per hour to base rate for employee working seventy-five (75) feet or more above ground or floor -- \$2.50 per hour to base rate for employee working one hundred (100) feet or more above ground or floor

PAINTERS / HEAVY & HIGHWAY:

Brush, Roller & Paperhangers	HEAVY & HIGHWAY	BASE RATE	\$19.15
		FRINGE BENEFITS	4.88
Drywall Finishers & Plasterers	HEAVY & HIGHWAY	BASE RATE	\$19.40
		FRINGE BENEFITS	4.88
Spray, Sandblast, Power Tools, Waterblast, Steam Cleaning, Brush & Roller of Mastics, Creosotes, Kwinch Koate and Coal Tar Epoxy	HEAVY & HIGHWAY	BASE RATE	\$20.15
		FRINGE BENEFITS	4.88
Spray of Mastics, Creosotes, Kwinch Koate and Coal Tar Epoxy	HEAVY & HIGHWAY	BASE RATE	\$21.15
		FRINGE BENEFITS	4.88

PLUMBERS & PIPEFITTERS:

BASE RATE	\$32.00
FRINGE BENEFITS	16.48

ROOFERS: (Excluding Metal Roofs)

BASE RATE	\$16.90
FRINGE BENEFITS	4.95

SHEETMETAL WORKERS: (Including Metal Roofs)

BASE RATE	\$28.40
FRINGE BENEFITS	11.52

SPRINKLER FITTERS:

BASE RATE	\$29.55
FRINGE BENEFITS	17.22

TRUCK DRIVERS / BUILDING:

Truck Helper and Warehouseman	BUILDING	BASE RATE	\$10.06
		*FRINGE BENEFITS	1.33

TRUCK DRIVERS / BUILDING: CONTINUED

Driver - 3 tons and under, Greaser, Tire Changer and Mechanic Helper			
	BUILDING	BASE RATE	\$10.18
		*FRINGE BENEFITS	1.33
Driver - over 3 tons, Drivers, Semi-Trailer or Pole Trailer; Dump Trucks, Tandem Axle; Farm Tractor when used to pull building material or equipment	BUILDING	BASE RATE	\$10.29
		*FRINGE BENEFITS	1.33
Drivers, Concrete Mixer Trucks (all types, hauling on job sites only); Truck Mechanics	BUILDING	BASE RATE	\$10.36
		*FRINGE BENEFITS	1.33
Drivers, Euclid and other Heavy Earth Moving Equipment and Low Boy, Winch Truck and A-Frame Truck and Monorail Truck when used to transport building materials, Forklift Truck when used inside warehouse or storage area.	BUILDING	BASE RATE	\$10.46
		*FRINGE BENEFITS	1.33

*Fringe benefits - Apply to each employee (whose name appears on the payroll that week) who has been employed a minimum of twenty (20) work days within any ninety (90) consecutive day period for that employer.

TRUCK DRIVERS / HEAVY HIGHWAY

Truck helper and warehouseman, mobile batch truck helper.			
	HEAVY & HIGHWAY	BASE RATE	\$17.78
		**FRINGE BENEFITS	2.28
Greaser, tire changer and mechanic helper.			
	HEAVY & HIGHWAY	BASE RATE	\$17.83
		**FRINGE BENEFITS	2.28
Truck mechanic	HEAVY & HIGHWAY	BASE RATE	\$18.06
		**FRINGE BENEFITS	2.28
Driver-single axle dump and flatbed truck, semi-trailer or pole trailer when used to pull building materials and equipment, tandem axle dump truck, driver of distributors, driver on mixer trucks (all types).			
	HEAVY & HIGHWAY	BASE RATE	\$18.13
		**FRINGE BENEFITS	2.28

TRUCK DRIVERS / HEAVY HIGHWAY: CONTINUED

Driver-Euclid and other heavy earthmoving equipment and low-boy, articulator, cat truck, 5-axle wheel, winch truck and A-Frame truck when used in transporting materials, Ross Carrier, forklift truck when used to transport building materials, driver on pavement breakers.

HEAVY & HIGHWAY

BASE RATE	\$18.14
**FRINGE BENEFITS	2.28

**FRINGE BENEFITS apply to employees who have been employed a minimum of twenty (20) workdays within any ninety (90) consecutive day period of that employer.

END OF DOCUMENT
CR 8-005
February 27, 2013

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 RELATED SECTIONS

- A. Section 00410 – Bid Form
- B. Section 00710 – General Conditions
- C. Section 00715 – Supplementary Conditions

1.02 CONDITIONS FOR PAYMENT

- A. The Owner will make payments for acceptable Work in place and materials properly stored on-site. The value of payment shall be as established on the approved construction schedule and Application for Payment, EXCEPT the Owner will retain a percent of the Work in place and a percentage as hereinafter listed for items properly stored or untested.
- B. No payment will be made for stored materials unless an invoice from the supplier is attached to the pay request. Furthermore, no payment for stored materials will be made if the value of the stored materials does not exceed \$1,000.00.
- D. Allowable Payments

Equipment and Lump Sum Items: Payment for equipment and lump sum items will be based on the percent complete (as approved by the Engineer) at end of period for application for payment. Payment for equipment and lump sum items installed shall be limited to ninety five percent (95%) of their scheduled value until they are ready for operation, have been certified by manufacturer, and accepted by the Engineer. Ninety five percent (95%) payment shall be contingent on proper on-site storage and proper routine maintenance as recommended by manufacturer or Engineer.

1.03 CLAIMS FOR EXTRA WORK

- A. If the Contractor claims that any instructions by Drawings or otherwise involve extra cost, he shall give the Engineer written notice of said claim within ten (10) days after the receipt of such instructions, and in any event before proceeding to execute the Work, stating clearly and in detail the basis of his claim or claims. No such claim shall be valid unless so made.
- B. Claims for additional compensation for extra Work will not be recognized unless accompanied with supporting data clearly demonstrating the additional quantities, labor and time.

- C. Any discrepancies which may be discovered between actual conditions and those represented by the maps and Drawings shall at once be reported to the Engineer, and Work shall not proceed, except at the Contractor's risk, until written instructions have been received by him from the Engineer.

1.04 DETERMINATION OF THE VALUE OF EXTRA (ADDITIONAL) OR OMITTED WORK

- A. The value of extra (additional) or omitted Work shall be determined in one or more of the following ways:
 - 1. On the basis of the actual cost of all the items of labor (including on-the-job supervision), materials and use of equipment plus a maximum of fifteen percent (15%) which shall cover the Contractor's and Subcontractor's general supervision, overhead and profit. The cost of labor shall include required insurance, taxes, and fringe benefits. Equipment costs shall be based on current rental rates in the areas where the Work is being performed, but in no case shall such costs be greater than the current rates published by the Associated Equipment Distributors, Chicago, Illinois.
 - 2. By estimate and acceptance in a lump sum.
 - 3. By unit prices named in the Contract or subsequently agreed upon.
- B. Provided, however, that the cost or estimated cost of all extra (additional) Work shall be determined in advance of authorization by the Engineer and approved by the Owner.
- C. All extra (additional) Work shall be executed under the conditions of the original Contract. Any claim for extension of time shall be adjusted according to the proportionate increase or decrease in the final total cost of the Work unless negotiated on another basis.
- D. Except for overruns in Contract unit price items, no extra (additional) Work shall be done except upon a written Change Order from the Engineer, and no claim on the part of the Contractor for pay for extra (additional) Work shall be recognized unless so ordered in writing by the Engineer.

1.05 VALUE ENGINEERING

- A. Value engineering is producing an equivalent or better option to that specified in the Contract at a lesser cost. The Owner may consider as a value engineering proposal any cost reduction that is initiated, developed, and submitted to the Owner. The Owner will share equally the net savings resulting from a value engineering proposal that is approved.

The Owner will only consider value engineering proposals that may potentially result in savings without impairing essential functions and characteristics in the facility. Essential functions and characteristics include, but are not limited to,

service, life, reliability, economy of operation, ease of maintenance, standardized features, safety, satisfaction of customer needs, desired ability, and special design requirements.

B. The Contractor shall formally submit, as a minimum, the following information to be reviewed for the value engineering proposal.

1. A statement that the proposal is submitted as a value engineering proposal.
2. A detailed description of the existing work and the proposed changes for performing the work. Include a discussion of the comparative advantages and disadvantages of each.
3. A statement of the time by which the Owner must execute an agreement adopting the proposal to obtain the maximum cost reduction during the remainder of the Contract, and the reasoning for this time schedule.
4. A complete set of Plans and construction details when necessary, showing proposed revisions to the original Contract prepared by a registered Professional Engineer licensed in the state of Kentucky.
5. A complete engineering analysis of the proposed changes prepared by a registered Professional Engineer licensed in the state of Kentucky. The analysis shall include sufficient detail and information to indicate that the proposal changes will perform or function in an equivalent of superior function to the existing design.
6. A detailed cost estimate for performing work under the existing Contract and under the proposed change. Include pay items, pay units, quantities, and unit prices. Include in the unit prices all costs for labor, materials, supplies, equipment tools, and all incidentals required for the complete incorporation of the option into the work.
7. A detailed cost estimate for costs other than those in the Contract, such as future construction, design, utilities, maintenance and operation costs, and the cost to prepare the value engineering proposal.
8. A prediction of any effects the proposed changes would have on Owner's costs, other than construction, such as maintenance and operating costs and life cycle costs.
9. A statement of the effect the proposal would have on the time for completion of the Contract.

The Engineer will review the formal proposal and, if acceptable, will execute a change order that incorporates the necessary Contract modifications. Unless and until the Owner executes a change order, perform all work according to the terms of the existing Contract. The Engineer reserves the right to include in the change order any conditions deemed appropriate for consideration, approval, and the implementation of the value engineering proposal.

The Engineer's approval of a value engineering proposal voids any restrictions that the Contractor had imposed on the use or disclosure of the information that the Contractor included in the value engineering proposal. The Owner and the Engineer then have the right to use, duplicate, and disclose in whole or in part, any data necessary to implement any portion of the proposal on this project and all other projects.

The Owner and the Engineer will not be liable for any delay in acting upon any value engineering proposal. The Owner and the Engineer will allow the withdrawal, in whole or in part, of any value engineering proposal that has not been accepted within the period specified with the proposal.

The decision of the Engineer to accept or reject a value engineering proposal will be final. The Engineer will make written notification of the decision to accept or reject each value engineering proposal submitted under the provisions of this section. The Owner reserves the right not to consider any value engineering proposal.

- C. The Engineer will adjust the Contract completion time for any time savings realized by implementing a value engineering proposal. The Owner will not provide any incentive pay for early completion days resulting from a time savings related to an approved value engineering proposal. The Engineer will grant additional contract time when specified in the change order.
- D. The Engineer will measure the net savings in cost by subtracting the estimated construction costs of the proposed and accepted option and all other costs associated with the option such as design, right-of-way, utilities, the cost of preparing the value engineering proposal, and the Engineering review costs from the estimated construction costs in original Contract for the option.
- E. The Owner will make payment for 50 percent of the net savings in cost. The Owner will consider payment as full compensation for all work required under this section.

PART 2 - PRODUCTS

2.01 MOBILIZATION/DEMOBILIZATION

- A. Measurement for payment shall be on the basis of a lump sum price. In no case shall the lump sum unit price exceed three (3.0%) of the total Bid amount.
- B. This work consists of all costs incurred for moving/removing equipment and materials onto/from the Project area and any pertinent costs related thereto.
- C. Payment will be made at the contract lump sum price for Bid Item 1 – MOBILIZATION/DEMOBILIZATION.

2.02 GENERAL CONDITIONS

- A. Measurement for payment shall be on the basis of a lump sum price. In no case shall the lump sum unit price exceed two percent (2.0%) of the total Bid amount.
- B. This work consists of insurance, performance, payment and warranty bonds, establishing temporary utilities, setting up field offices, constructing project sign, and any other items required under bidding requirements, contract forms, and conditions of the Contract.
- C. Payment will be made at the contract lump sum price for Bid Item 2 – GENERAL CONDITIONS.

2.03 CLEARING AND GRUBBING

- A. Measurement for payment shall be on the basis of a lump sum price.
- B. This work consists of the removal and disposal of the existing vegetation and trees to be disturbed by construction in the project area. Trees, brush, and related vegetation shall be hauled off-site and disposed in accordance with local codes and regulations.
- C. Payment will be made at the contract lump sum price for Bid Item 3 – CLEARING AND GRUBBING.

2.04 EROSION CONTROL

- A. Measurement for payment shall be on the basis of a lump sum price. .
- B. This work consists of furnishing and placing silt bales, silt fences, and/or silt checks in accordance with the Drawings and Specifications.
- C. Payment will be made at the contract lump sum price for Bid Item 4 – EROSION CONTROL.

2.05 DEMOLITION OF THE DAM OUTLET BOX AND EXPOSING THE DAM FOUNDATION

- A. Measurement for payment shall be on the basis of a lump sum price.
- B. This work consists of all labor and equipment to saw-cut and remove the existing dam outlet box, and excavate and expose the dam's foundation in the area west of the outlet box in accordance with the Drawings and Specifications. The Contractor shall pressure wash the rock foundation for inspection by the Engineer. Area excavated shall be backfilled with #9 crushed stone aggregate.
- C. Payment will be made at the contract lump sum price for Bid Item 5 – REMOVAL OF WATER OUTLET BOX AND EXCAVATION.

2.06 24" INTAKE SCREEN & PIPING

- A. Measurement for payment shall be on the basis of a lump sum price.
- B. This work consists of all labor and equipment for installing the 24" Intake Screen, 24" D.I. Piping and appurtenances, 20" Butterfly Valve, and 12" Butterfly Valve in the vicinity of the dam outlet box and in accordance with the Drawings and Specifications. This includes the concrete cap installed on the existing dam structure and 24" drum intake screen. The Contractor shall be responsible for any accessories or other items necessary for the complete installation.
- C. Payment will be made at the contract lump sum price for Bid Item 6 – 24" INTAKE SCREEN & PIPING.

2.07 24" HDPE, DIPS, DR-32.5 STREAM DIVERSION PIPE

- A. Measurement for payment shall be on the basis of linear foot along the centerline of the pipe.
- B. This work consists of all labor, material and equipment for laying pipe to grade and backfilling in accordance with the Specifications and Drawings. The Contractor shall be responsible for any accessories or other items necessary for the complete and operational installation.
- C. Payment will be made at the contract unit price to the nearest foot interval for Bid Item 7 – 24" HDPE, DR-35 STREAM DIVERSION PIPE.

2.08 STREAM DIVERSION STRUCTURE

- A. Measurement for payment shall be on the basis of a lump sum price.
- B. This work consists of all labor, materials, and equipment for the placement of a stream diversion structure in accordance with the Specifications and Drawings. Included in this item are the sand bags, plastic liner, and 24" Shear Gate, channel re-alignment. The Contractor will be required to remove the portion of sandbags located in the stream channel at the conclusion of the Project.
- C. Payment will be made at the contract lump sum price for Bid Item 8 – STREAM DIVERSION WALL.

2.09 DIVERSION PIPE CONNECTION TO EXISTING RAW WATER MAINS

- A. Measurement for payment shall be on the basis of a lump sum price.
- B. This work consists of connecting the new 24" diversion piping after the HDPE MJ Adaptor to the existing 20" & 12" raw water piping in accordance with the Specifications and Drawings. This includes 20" D.I. Pipe, 12" D.I. Pipe, 20"

Butterfly Valves, 12" Butterfly Valves, and appurtenances. The Contractor shall be responsible for any accessories or other items necessary for a complete installation.

- C. Payment will be made at the contract lump sum price for Bid Item 9 – STREAM DIVERSION PIPE CONNECTION TO EXISTING RAW WATER PIPING.

2.10 4" BLOWOFF ASSEMBLY

- A. Measurement for payment shall be on the basis of a lump sum price.
- B. This work consists of installing a 4" Blowoff Assembly including 4" D.I. Piping, 4" Gate Valve and Rip-Rap splash-pad in accordance with the Specifications and Drawings. The Contractor shall be responsible for any accessories or other items necessary for a complete installation.
- C. Payment will be made at the contract lump sum price for Bid Item 10 – 4" BLOWOFF ASSEMBLY.

2.11 CONCRETE SPLASH-PAD AT THE TOE OF THE DAM

- A. Measurement for payment shall be on the basis of cubic yards of concrete required to complete the concrete splash-pad. The Engineer, or his representative, must be presented a copy of the ticket at the time of delivery.
- B. This work consists of all labor, materials, and equipment to excavate the loose rock, and install the concrete splash-pad at the toe of the existing dam as directed by the Engineer. Included in this item is the cost to remove the excess material from the site to a designated area for disposal.
- C. Payment will be made at the contract unit price to the nearest 1.0 cubic yard for Bid Item 11 – CONCRETE SPLASH PAD.

2.12 RIP-RAP CHANNEL LINING

- A. Measurement for payment shall be on the basis of installed tonnage of channel lining. The Engineer, or his representative, must be presented a copy of the ticket at the time of delivery.
- B. This work consists of all labor, material, and equipment for the placement and installation of Rip-Rap Channel Lining along the base of the existing dam in accordance with the Specifications and Drawings.
- C. Payment will be made at the contract unit price to the nearest 1.0 Ton for Bid Item 12 – RIP-RAP CHANNEL LINING.

2.13 PIPE ANTI-SEEP COLLAR

- A. Measurement for payment shall be on the basis of a lump sum price.

- B. This work consists of all labor, materials, and equipment necessary to install the Pipe Anti-Seep Collar in accordance with the Specifications and Drawings. Included in this item is all earthwork, concrete, rebar, grout, swellable waterstop, and any other incidentals as required for a complete installation.
- C. Payment will be made at the contract lump sum price for Bid Item 13 – PIPE ANTI-SEEP COLLAR.

2.14 REVEGETATION

- A. Measurement for payment shall be on the basis of a lump sum price.
- B. This work consists of soil conditioning and preparation, seed, fertilizer, mulch, bituminous material for mulch, lime, and all other labor and equipment to restore vegetation on the Project site in accordance with the Specifications.
- C. Payment will be made at the contract lump sum price for Bid Item 14 – REVEGETATION.

2.15 GROUT MIX DESIGN TESTING

- A. Measurement for payment will be completion of the grout mix design testing.
- B. This work consists of providing grout mix testing described in Section 31 33 53.
- C. Payment will be made at the contract lump sum price for Bid Item 15 – GROUT MIX DESIGN TESTING.

2.16 DRILL SETUP

- A. Measurement for payment will be for each accepted drill move to a different location, set up, and prepared and ready to begin drilling.
- B. Measurement for payment will be for each accepted drill move to a different location, set up, and prepared and ready to begin drilling.
- C. Payment will be made at the contract unit price for Bid Item 16 – DRILL SETUP.

2.17 GROUT HOLE DRILLING - OVERBURDEN DRILLING AND STANDPIPE INSTALLATION

- A. Measurement for payment will be the number of linear feet of standpipe acceptably installed through overburden from the top of the hole (as surveyed by Contractor) to the approved bottom of the hole or as directed by the Engineer.
- B. This work consists of drilling and installation of standpipe casing with grouted annular seal through overburden soil in a grout hole, verification hole, or an

exploratory hole in accordance with Section 02250 – Drilling and Pressure Grouting.

- C. Payment will be made at the contract unit price to the nearest 0.1 linear foot for Bid Item 17 - GROUT HOLE DRILLING - OVERBURDEN DRILLING AND STANDPIPE INSTALLATION.

2.18 GROUT HOLE DRILLING – CORE DRILLING

- A. Measurement for payment will be the number of linear feet of coring acceptably performed from the top of the dam to the approved bottom of the hole or as directed by the Engineer.
- B. This work consists of coring and sampling concrete or rock in accordance with Section 02250 – Drilling and Pressure Grouting.
- C. Payment will be made at the contract unit price to the nearest 0.1 linear foot for Bid Item 18 – GROUT HOLE DRILLING – CORE DRILLING.

2.19 GROUT HOLE DRILLING – ROTARY PERCUSSIVE DRILLING

- A. Measurement for payment will be the number of linear feet of drilling acceptably performed from the top of the grout hole to the approved bottom of the hole or as directed by the Engineer. Measurement for payment of linear feet acceptably redrilled through previously placed descending stage grout shall be counted at one-half the unit price of grout hole drilling.
- B. This work consists of drilling a grout hole or verification hole in rock using rotary percussive drilling methods in accordance with Section 02250 – Drilling and Pressure Grouting.
- C. Payment will be made at the contract unit price to the nearest 0.1 linear foot for Bid Item 19 – GROUT HOLE DRILLING – ROTARY PERCUSSIVE DRILLING.

2.20 GROUT HOLE WASHING

- A. Measurement for payment will be the number of hours that water is circulated in the hole after drilling operations to flush cuttings and clean the hole for pressure testing. Time spent on set-up and dismantling equipment, down time due to equipment breakdown, additional flushing needed to reduce torque on drill string, and other time spent for the contractor's convenience or otherwise not productive to Grout Hole Washing shall not be measured for payment.
- B. This work consists of circulating water through the drill bit during drilling operations to flush cuttings and to clean the hole in accordance with Section 02250 – Drilling and Pressure Grouting.

- C. Payment will be made at the contract unit price to the nearest 0.1 hour for Bid Item 20 – GROUT HOLE WASHING.

2.21 WATER PRESSURE TESTING

- A. Measurement for payment will be the number of hours to perform pressure testing in accordance with Section 02250 – Drilling and Pressure Grouting. Time will begin when the test equipment is installed with packers inflated at the test interval depth and end when the last test in the hole is completed. Time required to move the test equipment within the hole will be included in the payment time, but is not to exceed five minutes for any single move within the hole. Time spent on set-up and dismantling equipment, down time due to equipment breakdown, and other time spent for the contractor's convenience or otherwise not productive to Water Pressure Testing of Grout Holes shall not be measured for payment.
- B. This work consists of performing staged pressure tests in accordance with Section 02250 – Drilling and Pressure Grouting.
- C. Payment will be made at the contract unit price to the nearest 0.1 hour for Bid Item 21 – WATER PRESSURE TESTING.

2.22 GROUTING CONNECTIONS

- A. Measurement for payment will be one payment for each grout hole and one for each reconnection after downstage grouting.
- B. This work consists of setting up and making the connections in preparation for grouting in accordance with Section 02250 – Drilling and Pressure Grouting.
- C. Payment will be made at the contract unit price for Bid Item 22 – GROUTING CONNECTIONS

2.23 PLACING GROUT

- A. Measurement for payment will be the number of hours to perform high mobility pressure grouting in accordance with Section 02250 – Drilling and Pressure Grouting. Duration shall be measured for each stage from the time grout begins flowing into the grout standpipe until the Engineer directs closure of the valve that allows grout to enter the hole. If, after refusal criteria are met, the Engineer directs that pressures be monitored prior to deflating the packer, then the payment time will be extended up to the time the Contractor is directed to deflate the packer. Time spent on set-up and dismantling equipment, down time due to equipment breakdown, and other time spent for the contractor's convenience or otherwise not productive to pressure grouting each stage shall not be measured for payment. If at any time the Contractor fails to have sufficient personnel or equipment available to effectively and rapidly deal with conditions that are unnecessarily extending the time required to place grout, time deductions will be

made from the measured time for this pay item. Examples of items for which deductions will be made include but are not limited to; failure of the Contractor to efficiently maintain sufficient quantities of mixed materials or prepare new mixes, and failure of the Contractor to have replacement parts and tools on hand necessary for successful prosecution of the work.

- B. This work consists of performing pressure grouting using high mobility grout including handling all materials, mixing, placement, performing quality control testing, and maintaining grout records in accordance with Section 02250 – Drilling and Pressure Grouting.
- C. Payment will be made at the contract unit price to the nearest 0.1 hour for Bid Item 23 – PLACING GROUT.

2.24 CEMENT FOR GROUTING

- A. Measurement for payment for all constituents shall be based on the number of 94-pound bags (or bulk weight equivalent) of cement acceptably placed in the grout hole. Cement that is used in wasted grout will be measured for payment only when the Engineer specifically directs the Contractor to waste grout that was properly mixed, met all acceptance criteria and was ready for injection. One bag of cement shall be defined as 94 pounds dry weight of cement.
- B. This work consists of procuring all constituents used in the approved grout mixtures including, but not limited to cement, bentonite, viscosity modifiers, admixtures, water, and pozzolans, in accordance with Section 02250 – Drilling and Pressure Grouting.
- C. Payment will be made at the contract unit price for Bid Item 24 – CEMENT FOR GROUTING.

- END OF SECTION -

SECTION 02112

SITE CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 SUMMARY

The Contractor shall furnish all labor, materials, and equipment necessary to perform all clearing, grubbing, and top soil removal in accordance with the Drawings and Specifications.

1.02 SUBMITTALS

There are no submittals required for this section.

1.03 REGULATORY COMPLIANCE

The Contractor shall conform to all applicable local, state, and federal codes and ordinances for disposal of debris.

PART 2 - PRODUCTS

2.01 EQUIPMENT

The equipment used for site clearing and grubbing will be of the Contractors option.

PART 3 - EXECUTION

3.01 SITE CLEARING

- A. All trees, stumps, snags, shrubs, brush, saplings, and vines shall be cleared in the designated project area.
- B. Necessary care shall be exercised by the Contractor when cutting trees near wire lines structures, roadways, or other facilities in order to prevent damage. The Contractor will be responsible for all damages to such facilities that may occur.
- C. No clearing shall occur outside the limits specified in the Drawings.

3.02 GRUBBING

- A. All stumps, roots, and root systems having a diameter of 1/2-inch diameter or larger shall be grubbed out to a depth of at least 18 inches below the surface in all designated areas. The depth shall be measured from the existing ground surface or the proposed finished grade, whichever is lower.
- B. No debris shall be allowed to be left in the fill area.

3.03 DISPOSAL

- A. All trees shall be removed from the fill sites to an area designated by the OWNER.
- B. All other excess material from the clearing and grubbing operation shall be disposed of by the Contractor in a manner approved by the Engineer. The Contractor shall be responsible for determining and complying with all local ordinances relating to disposal and/or burning of clearing and grubbing material.

- END OF SECTION -

SECTION 02250

DRILLING AND PRESSURE GROUTING

PART 1 GENERAL

1.1 SUMMARY

- A. The work in this section specifies the requirements for pressure grouting
- B. This Section specifies the following components of the work, to include furnishing all materials, plant, labor, and equipment as described and specified:
 - 1. grout mix design testing
 - 2. surveying to accurately set the location, direction, inclination, and elevation of the drill holes
 - 3. installation of grout standpipe
 - 4. drilling cored and rotary percussive holes
 - 5. pressure washing
 - 6. water pressure testing (permeability)
 - 7. pressure grouting, including proportioning, mixing, and pumping grout
 - 8. tremie backfilling all drilled holes
 - 9. all such related activities that are incidental to pressure grouting operations.
- C. The amount of drilling and pressure grouting to be performed cannot be precisely predicted and will depend upon the nature of the materials encountered as the work proceeds. Drilling and grouting shall be performed at such locations, at such inclinations, to such depths, and in such quantities as shown on the Drawings or as directed or approved by the Engineer. The Contractor shall drill and grout under pressure any faults, joints, shear zones, springs, and other foundation defects that may require grouting as determined by the Engineer.
- D. The Contractor shall anticipate that the foundation shall be highly irregular with steep and changing slopes. The Contractor shall be responsible for moving material and equipment for access to grouting locations.
- E. Ground treatment for surface and subsurface excavation in rock or soil or for improving ground conditions along the grout curtain alignment and associated access to suit the Contractor's method of working is regarded as temporary works, is not covered in this Section, and is to be performed at no additional cost to the Owner.
- F. All pressure grouting operations shall be performed in the presence of the Engineer or his representative.
- G. The Contractor shall notify the Engineer with a minimum 48 hours notice of the proposed grouting schedule, changes in shift schedule or absence from site.
- H. The performance goal of the grouting program is to achieve a residual Lugeon value of 5 or less. Verification holes will be water-pressure tested and will be considered to have met the performance goal for stages with Lugeon values of 5 or less. For stages in the verification holes that do not meet the performance goal the performance goal will be considered satisfied if grout injection in the stage is less than 3.0 gal/ft at grouting termination.

1.2 MEASUREMENT AND PAYMENT

- A. The basis for measurement and payment is provided in Section 01025 – Measurement and Payment.

1.3 REFERENCES

- A. ASTM International, latest revision:

1. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field
2. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
3. ASTM A53 – Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
4. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2-in. or {50-mm} Cube Specimens.
5. ASTM C150 – Standard Specification for Portland Cement
6. ASTM C191 - Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
7. ASTM A234 – Specification for Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
8. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
9. ASTM C940 – Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory
10. ASTM C1064 – Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
11. ASTM C1602 – Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

- B. American Petroleum Institute:

1. API RP 13B-1 – Recommended Practice for Field Testing Water-Based Drilling Fluids

1.4 SUBMITTALS

- A. A Grouting Work Plan shall be submitted at least 21 calendar days prior to the start of any grouting operations. The Grouting Work Plan shall include, as a minimum, a full description of the following information:

1. Contractor's proposed sequence of grouting consistent with the Specifications and planned excavation sequence, including duration of all activities.
2. Proposed personnel and responsibilities, including resumes of the project manager, site superintendent, and drilling and grouting foreman(s) who will be responsible for the planning, supervision and direction of the Contractor's grouting work.

3. Proposed equipment and procedures for drilling, installation of standpipes, hole washing, water pressure testing, grout mixing and pumping (including pump rating curves and mixer details), grout materials storage, and quantity measurement.
 4. Proposed equipment and procedures for quality testing.
 5. Method of access to the drill hole locations, including temporary works such as grout pad and access roads
 6. Plan for containing, treating and/or disposing of waste drill cuttings, spilled grout, and fluids
 7. Proposed water source
 8. Plan of Operations: The Contractor shall submit a plan showing his planned sequence and duration of all activities. The Plan of Operations shall include, but not be limited to, the number of drill rigs, water pressure testing assemblies in use, and grout plants and shall be prepared in sufficient detail to allow the Engineer to plan and staff his daily activities. The Plan of Operations shall be updated and submitted at least one week in advance of any planned change in operations. Failure to provide the plan may result in shutdown of the grouting operation without compensation to the Contractor.
 9. Manufacturer's Material Safety Data Sheets for all materials and products to be used in the foundation drilling and grouting program
 10. Quality plan including material suppliers' recommended storage instructions, methods for assuring and recording accurate mix formulations for each stage grouted, including QC data sheets
 11. Pollution Prevention and Control: In addition to site-wide sedimentation and erosion controls, the Contractor shall install measures to prevent the stream from damage and pollution resulting from grouting activities including but not limited to grout leaks, spills, and waste and accidental oil, fuel, or chemical spills. The Contractor shall at a minimum provide the following as part of the Grouting Work Plan:
 - a. Plan and location for disposing of and containing waste grout to allow for hydration and settling of cement particles.
 - b. Plan and details for preventing pollution of the stream channel downstream of the dam.
- B. The Grout Mix Design program shall include, as a minimum, the following and be described in the required Grouting Work Plan:
1. Mixing equipment to be used including location of each piece of equipment.
 2. Types and quantities of materials to be used in each mix
 3. Procedure for mixing including order of mixing of materials and mix time for each component
 4. Cement mill certification
 5. Certification of admixtures
 6. Product sheets for all material components
 7. Material properties of each of the proposed mixes including:
 - a. Unconfined Compressive Strength (psi at 28 days)
 - b. Apparent (Marsh) Viscosity (sec)
 - c. Specific gravity
 - d. Thixotropic (gel) time (hours)

- e. Initial and final set times (hours)
 - f. Pressure Filtration Coefficient ($\text{min}^{1/2}$) and filtrate volume (mL)
 - g. Bleed (%) at 2 hours
 - h. Theoretical yield of proposed mixes, in gallons
- C. Daily Workplan: At a minimum of once per work shift, the Contractor shall provide a schedule of planned shift activities including holes to be drilled, washed, water pressure tested, and grouted.
- D. General Reports: The Engineer will keep records of grouting operations, such as a log of the grout holes, results of pressure testing operations, time of each change in grouting operations, pressure, rate of pumping, amount of mix components, equipment defects and breakdowns, and other data as deemed by the Engineer to be necessary. Contractor shall furnish all necessary assistance and cooperation to this end. The Contractor is responsible for making necessary measurements and reporting them to the Engineer. The Contractor shall keep duplicate records as he deems necessary. The Engineer and Contractor will reconcile their records daily to check that both parties are in agreement with payment quantities.
- E. Calibration Certificates: Calibration of each measuring device used on the project shall be performed by a company specializing in the calibration of the type of instrument being calibrated no more than 2 months before mobilization. All calibration certificates shall be traceable to the National Institute of Standards and Technology (NIST). Measuring devices to be calibrated shall include:
- 1. pressure gauges
 - 2. flow meters
 - 3. pressure transducers
 - 4. volume and weight measurement equipment used for grout materials during mixing
- F. Submit certificates of compliance for grout ingredients and admixtures. All shipments of grout materials and admixtures to the site shall be accompanied by the manufacturer's written verification of the source and the quality or specification of the material.
- G. The Contractor shall submit stage and summary grouting records within one calendar day of completion of the water pressure testing or pressure grouting of any stage in a grout hole.
- 1. Water pressure testing or pressure grouting stage records shall include:
 - a. Hole location, number, inclination, date, and stage depth interval.
 - b. Head (elevation) difference between the pressure gauge at the header and the ground surface at the hole.
 - c. Water level in the hole.
 - d. Flow into the stage in gallons per minute.
 - e. Gauge pressure and effective pressure.
 - f. Beginning time, end time, and total time (minutes) of production on the stage.
 - g. Total placed volume (gallons) of water or each type of grout mix.
 - h. Lugeon value during water pressure testing or apparent Lugeon value during pressure grouting.

- H. Driller's Hole Logs: Prepare and submit to the Engineer an accurate Driller's Log of each hole drilled with descriptions, including the top and bottom depths of all materials encountered during drilling, drilling penetration rate, color of return drill water, loss or gain of drill water, binding of drill bit, locations of very fast or slow penetration rate, and locations of unusual or notable features.
- I. Submit results of QC testing performed as required in Section 1.5, Quality Requirements, on a weekly basis and within one week of completion of work.

1.5 QUALITY REQUIREMENTS

- A. The Engineer shall have the right to require the Contractor to make changes in the equipment which the Engineer determines necessary to make the equipment perform in accordance with the specifications and the performance goal during grouting operations.
- B. The following information shall be provided to the Engineer before any given stage is accepted: rate of injection; specific gravity and Marsh Value of grout mix; effective pressure, gauge pressure, quantity of grout placed; and calculated apparent Lugeon values.

1.6 QUALIFICATIONS

- A. The Contractor shall provide experienced grouting personnel in all positions supervising grouting work.
- B. Grouting work shall be under the supervision and direction of an individual with a minimum of 10 years in responsible charge of grouting for construction similar in nature to that required by this work. All other supervisory personnel must have a minimum of 5 years similar experience. The driller shall have a minimum of two years of experience as a drill operator.
- C. The Contractor shall maintain sufficient qualified personnel to perform the required drilling, water pressure testing, and grouting work including processing of all results.

PART 2 PRODUCTS

2.1 GENERAL

- A. The Contractor shall furnish materials and equipment necessary for drilling, water pressure testing and grouting grout holes. Any grout hole that is lost or damaged due to negligence of the Contractor or mechanical failure of equipment shall be replaced by the Contractor at no cost to the Owner.
- B. The Contractor shall be responsible for determining and procuring the materials and supplies required for installation of pollution preventative measures.
- C. Drilling, water pressure testing, and grouting equipment shall be maintained and shall be capable of continuous and efficient performance during any grouting operation.
- D. The Contractor shall provide grout-circulation accessories to include pipe, fittings, pressure hose, and assorted small tools, as necessary, to provide a continuous supply of grout and pressure control.
- E. Adequate standby equipment shall be available in order to ensure that no interruptions to continuous grouting of any given stage occur.

2.2 GROUTING CONSTITUENTS

- A. **Portland Cement:** Portland cement shall conform to the requirement of ASTM C150 for Type III cement. The use of bulk cement will be permitted provided the Contractor employs methods of handling, measuring, transporting, and storage that are satisfactory to the Engineer; otherwise, only cement furnished in paper bags will be acceptable.
- B. **Pozzolan:** Pozzolan for use in grout shall be fly ash that conforms to the Class F requirement of ASTM C618. The use of bulk pozzolan will be permitted provided the Contractor employs methods of handling, measuring, transporting, and storage that are satisfactory to the Engineer, otherwise only pozzolan furnished in paper bags will be acceptable.
- C. **Water:** Water used shall be clean and free from injurious amounts of oil, acid, organic matter or other deleterious substance and conform to the chemical limits requirements in Table 2 of ASTM C1602 and have a turbidity of less than 10 NTU. Contractor shall provide verification that water meets the requirements of this section prior to grout-mix testing and once each month thereafter during grouting operations. Contractor shall provide an instrument for measuring turbidity and provide verification once each day that water meets the turbidity requirement.
- D. **Bentonite:** Bentonite shall be premium grade powdered natural sodium montmorillonite (Wyoming) and meet the most current requirements of API Specification 13A. Bentonite to be used in the grout mix shall be API Grade, 200 mesh, 90 bbl yield sodium bentonite powder that is mixed into a slurry and allowed to hydrate for 12 hours prior to use.
- E. **Sand:** If approved by the Engineer, Contractor may use natural quartz sand as a bulk filler for areas of significant grout take. The sand shall conform to the following gradation:

Sieve Designation (U.S. Std. Square Mesh)	Percent Passing by Weight
16	100
50	20-50
100	10-30
200	0-5

- F. **Admixtures:** Admixtures shall be added to the grout during mixing in accordance with the manufacturers recommendations and may consist of viscosity modifiers, high-range water reducer (superplasticizer), silica fume, water reducers, accelerators, anti-washout agents, or other additives approved by the Engineer to meet the performance requirements of the grouts.
 - 1. **Viscosity Modifier:** Soluble, high molecular weight biopolymer, such as Welan Gum or Diutan Gum shall be stable over the anticipated range of pH and temperature and be compatible with high calcium environments
 - 2. **High-Range Water-Reducing Admixture (HRWRA) (superplasticizer):** HRWRA shall be Naphtholene-based and uniform in consistency, quality, and strength of solution. The Contractor shall use alternative brands if the brand chosen by the Contractor results in abnormal setting of grout.
- G. **Storage, supply and other requirements:**
 - 1. Sufficient quantity of all materials shall be on hand to ensure that grouting operations will not be interrupted or delayed. Materials shall be stored and protected at all times so that the quality of the materials is maintained.
 - 2. All grout mix components shall be compatible with each other and shall be used in conformance with the manufacturer's recommendations.

3. The source of grouting constituents shall not be changed during the grouting program, without Engineer approval and a new set of grout mix tests using the proposed grouting constituents. These new grout mix tests shall be at Contractor expense.

2.3 PIPE FOR WATER TESTING AND GROUTING OPERATIONS

- A. The contractor shall provide all necessary supply pipes, hoses, and fittings for delivery of water and grout.
- B. Pipe used to transfer grout from the grout plant to the manifold and grout or water from the manifold to the hole shall have a minimum nominal diameter of 1 inch.
- C. Pipe used for water-pressure testing and pressure grouting shall be either 1) standard weight, schedule 40, black steel conforming to the requirements of ASTM A53 or 2) any flexible pipe capable of withstanding twice the maximum pump and/or grouting pressure. The pipe used to transport grout from the manifold to the hole shall not change in diameter between the manifold and the hole.
- D. If steel piping is used for water-pressure testing and grouting, the pipe fittings used with the steel pipe shall be malleable iron or steel fittings conforming to the requirements of ASTM A234.
- E. If flexible pipe is used for water pressure testing or pressure grouting, the pipe shall be marked in 10-foot increments with colored tape as measured from the bottom of the packer (top packer of double packer assembly) and proceeding up the pipe.

2.4 PRESSURE PACKERS

- A. Inflatable packers used for water-pressure testing and grouting shall have a minimum 2-foot long rubber bladder section and include all necessary accessories for operation including inert gas (e.g. compressed air, nitrogen, etc.) supply, tubing, gauges, regulators, and valves. The pipe through the packers shall have a minimum inside diameter (ID) of 1 inch.
- B. Packers shall be designed so that they can be expanded to seal the drill holes at the specified depths and, when expanded, shall be capable of withstanding, without leakage, pressure equal to the maximum effective grout pressures or effective water-test pressures to be used for the entire period of time in which the packer is in use.
- C. The Contractor shall have available at all times, a sufficient number and variety of packers to accomplish the grouting and water-pressure testing.

2.5 PUMPING AND HEADER EQUIPMENT

- A. Pumps: Pumps supplying pressurized water and grout to the packer assemblies shall be progressive cavity, screw type pumps (similar or equal to a Moyno pump), with a capacity of 35 gpm at a pressure of 150 psi. The progressive cavity pumps shall be maintained in satisfactory working condition at all times. A standby grout pump, capable of being placed in operation with no more than 15 minutes notice, shall be included as part of the grout plant.
- B. Header: Grout shall be circulated between a grout header with control valves and the continuous cavity grout pump. A supply grout line shall connect from the grout pump at the holding tank to a T joint to which the grout header and a return line connected back to the holding tank are also attached. Saunders diaphragm valves shall be connected to the return line and to the grout header and shall be used for controlling the gauge pressure applied to a grout hole. The header, consisting of a magnetic flow meter, pressure transducer, and pressure gauge with gauge saver, shall be joined directly to the riser pipe or grout hose at the hole by means of a quick-connector union.

The flow meter shall be oriented such that flow through the flow meter will travel in an upward direction so that cavitation will not be generated. The riser pipe or grout hose shall be the same dimensions, type and length as that used during line loss testing.

- C. Transducer: An operational electronic pressure transducer and flow meter shall be used for each water-pressure test. These instruments shall have a digital readout on the gauge and have inlet and outlet connection of not less than 1 inch in diameter. The smallest reading increment on the flow meter shall be not more than the equivalent of 0.1 gallon per minute. The smallest reading increment on the electronic pressure transducer shall be not more than the equivalent of 0.1 psi. Calibration certificates must be submitted prior to starting the work. A check of the flow meter calibration shall be made at the beginning of each production day in the presence of the Engineer using a calibrated bucket.
- D. Pressure Gauges: Mechanical pressure gauges shall be mounted in line next to the electronic pressure transducer. Provide glycerin filled calibrated pressure gauges with capacities of 0-30 psi, 0-60 psi, and 0-100 psi in sufficient number of each type to cover replacement and recalibration without any delay in work. All gauges shall have a minimum face diameter of 3 inches and pressure increment of 5 psi or less, and shall be of like make and model with clearly marked serial numbers. Submit calibration certificate for each gauge prior to use. Furnish to the Engineer one set of gauges to be held by the Engineer and used to check the calibrations of the other gauges. All pressure gauges shall be glycerin filled, plain case gauges with pressures indicated in pounds per square inch.
- E. Gauge Test Apparatus: An accurately calibrated gauge test apparatus, including a high-precision master gauge set, shall be provided by the Contractor for periodic checking of the accuracy of all gauges used in the grouting operations. The master gauge set shall include gauges with maximum ranges corresponding to each pressure gauge used in the grouting operations; and gauge testing shall be performed with gauges of corresponding maximum range. Each gauge in the master gauge set shall be accurate within 1% of its full-scale reading over the full range of the gauge, and shall be kept in a protective enclosure at the grout plant at all times.

2.6 WATER-PRESSURE TESTING EQUIPMENT

- A. Double-packer assemblies used for water-pressure testing shall consist of two, 2-foot-minimum length (bladder) packers that conform to Section 2.4 attached to both ends of a central 1-inch minimum inside diameter pipe. Both packers shall be expandable at the same time so as to provide a 20-foot-long isolated length of drill hole for water pressure testing.
- B. The Contractor shall provide a minimum of two double-packer assemblies for use. The pipe between the packers must provide sufficient strength and stiffness such that the assembly can be inserted to and retrieved from the bottom of a grout hole.
- C. The central pipe used in the double-packer assembly shall be perforated with enough equally spaced 1/4 to 3/8 inch holes such that the total area of the holes shall be equal to at least 2 times the inside cross-sectional area of the pipe (for example, at least 32 equally-spaced, 1/4-inch-diameter holes in a 1-inch ID pipe).
- D. Single-packer assemblies and related hoses used for water pressure testing shall generally conform to Section 2.4.

2.7 DRILLING, WASHING, AND SAMPLING EQUIPMENT

- A. General Drilling Equipment Requirements

1. The Contractor shall provide drilling equipment capable of accessing and angled holes to the depths shown on the Drawings. This may include the need for track equipment or hung equipment with cable and winch systems.
2. Drilling equipment and techniques shall minimize hole instability. Rod dope, grease, and other solid or liquid lubricants are allowed only on internal threads of casing, rods, or sampling equipment.
3. The drilling fluid used for drilling in rock shall be clean, clear, fresh water.
4. Drill rigs used for drilling in rock shall be equipped with pumps for circulating drilling water at sufficient rates to remove all drill cuttings for the entire length of the hole.
5. The use of air during drilling will not be allowed in any form.

B. Grout Hole Drilling Equipment:

1. Unless otherwise specified or approved by the Engineer, holes drilled through overburden shall be cased with a minimum 4-inch ID Schedule 80 PVC standpipe. Drilling equipment used to install casing through overburden, and at least two feet into rock, shall be sonic, auger, duplex rotary, or similar method, as approved by the Engineer.
2. The grout holes shall be drilled to a nominal diameter of 3.5 inches using rotary percussive drilling methods. Tricone-bit drilling in rock will not be allowed.

C. Core Hole Drilling Equipment

1. The Contractor may use rotary diamond or other approved core bits for obtaining an acceptable core. The type of rock and its condition will govern the uses of various bit types.
2. Accessories and supplies for core hole drilling shall include casing, drill rods, core barrels, coring bits, piping, pumps, tools, power, and all labels and containers required for rock core samples.
3. Ball-bearing, swivel-type, double-tube core barrels, meeting the standards established by the Diamond Core Drill Manufacturers Association, shall be used. The core barrels shall be fitted with core catchers suitable for catching and retaining cores through any rock formation.
4. The core barrels and bits used shall be designed so that the cores will not be exposed to the cutting or erosive action of circulating drilling fluid.
5. Rock and concrete cores that are obtained during core drilling shall be stored in wooden core boxes that hold 20 feet of NQ core. Wooden box covers shall be securely fastened to the core boxes.
6. Each core box shall be labeled on the lid, on the left-side end, and on the front side of the box. Label information shall include:
 - a. Project name and number
 - b. Hole number
 - c. Depth or elevation of the top and bottom of the sample in the box
 - d. Run number(s)
 - e. Date

- D. Hole-Washing Equipment: The Contractor shall provide equipment to wash grout holes and verification holes after the drilling of the holes is completed. Provide a 2-inch-nominal washout bit with 1/8-inch diameter side-discharge holes and not more than three 1/8-inch diameter bottom-

discharge holes. Provide a pump capable of supplying water to the washout bit at 25 gpm and 100-psi supply pressure at surface.

- E. Mechanical packers or expandable plugs shall be furnished and installed, as required, to seal holes of the size drilled at the site during the grouting work. A sufficient quantity of plugs shall be stored on-site so open holes awaiting pressure testing or grouting may be temporarily plugged.

2.8 GROUTING EQUIPMENT

- A. A mechanical high-speed, high shear grout mixing plant with a mixer that operates at 1,500 to 2,000 rpm shall be used to mix, agitate, and supply grout to the hole. The grout mixer shall have a minimum drum capacity of approximately 17 cubic feet and having the ability to supply enough grout to deliver at least 5 gpm of uninterrupted flow to each grout hole that is being grouted. A sufficient number of mixers shall be available and ready for immediate use to produce grout at the rates required by the hole(s) being grouted and without interruption due to mixer breakdown.
- B. Grout constituent measurement equipment at the grout plant shall be capable of measuring constituents to within 1% accuracy. The Contractor will be required to test and, as necessary, calibrate equipment such as flow meters and scales used to measure grout materials at the grout plant a minimum of once each week, or at any time the Engineer believes the equipment does not meet specifications. Equipment found to be defective shall be replaced immediately or grouting operations will be suspended until the equipment is functional. Testing and calibration procedures shall be demonstrated by the Contractor prior to grouting start up.
- C. Holding tanks capable of agitating and holding in suspension all solid matter contained in the grout shall be used to store grout after it has been mixed. The tanks shall have a minimum capacity of twice the volume of the mixer. The agitators shall be fitted with baffles to prevent vortex formation and equipped with paddles capable of rotating at a minimum of 30 rpm and set low enough in the tank such that a minimum of 20 gallons can be agitated by the paddles. Each tank shall also be equipped such that grout returning from the hole or entering from the mixer passes through a U.S. No. 16 mesh screen. The screen shall be readily accessible for cleaning and replacement. A calibrated dipstick shall be provided with each tank to assist in volume measurements. The grout pumps shall be connected directly to the holdover mechanical agitator tank. Circulation of grout as a sole means of agitation will not be acceptable.
- D. The Contractor shall provide a means of clearing the grout line that transmits grout from the grout plant to the holding tanks such that no grout is left in the line.
- E. The Contractor shall have oakum, wood wedges, lead wool and other suitable material on site for plugging of surface leaks.

2.9 ARRANGEMENT OF GROUTING EQUIPMENT

- A. The arrangement of grouting equipment shall provide a return line from the header back to the pump or hold-over tank, permitting continuous circulation of grout. The grout pressure shall be controlled at the header.
- B. Each hole shall be equipped with a hold shut-off valve below the hand-coupled union, permitting shut-off at refusal pressure and removal of the header to another hole while still maintaining pressure in the completed hole.

PART 3 EXECUTION

3.1 GENERAL

- A. All materials used for grouting operations shall be used stored in accordance with the instructions of the manufacturer and with all local, state, and federal laws and regulations.
- B. The Contractor shall keep work and storage areas free from accumulations of material waste and garbage and shall dispose of waste materials and garbage in accordance with all local, state, and federal laws and regulations.
- C. The location, spacing, direction, inclination and depth of the primary and mandatory secondary grout holes foreseen are shown on the Drawings. The actual location, spacing, direction, and depth of each grout hole may be modified as additional information becomes available and shall be as directed by the Engineer. The locations of the grout holes shall be marked by a Licensed Land Surveyor as shown in plan view on the Drawings and the coordinates and elevations of the holes shall be provided to the Engineer before drilling commences.
- D. Grout holes shall be grouted by split-spacing sequencing as shown on the Drawings primarily using ascending stage techniques where permitted by the stability of the drill holes. Each grout hole shall be grouted in stages to treat the foundation as determined by the Engineer.
- E. Standpipe shall be installed at each grout hole as shown on the Drawings to facilitate access to the foundation bedrock and the identification, protection, and capping of the holes. The holes drilled for installation of the standpipe or grout nipples shall be sufficiently large in diameter to facilitate adjustment of the nipple position to achieve the desired angle.
- F. Grout temperatures shall be no lower than 50 degrees Fahrenheit and no higher than 85 degrees Fahrenheit. The Contractor shall insulate all grout lines that supply grout from the mixer to the agitator and from the agitator to the grout header if the ambient temperatures are below 50 degrees or above 90 degrees F.
- G. Maximum pressures used for water pressure testing and pressure grouting will be the effective pressure calculated based on the shortest distance between the middle of a stage and ground surface. Water pressure testing Lugeon values and apparent Lugeon values during grouting shall be calculated using the effective pressure. The maximum effective grouting pressure shall be determined according to the following list or as directed by the Engineer.
 - 1. 0.5 psi per foot of depth for soil/rock interface, overburden, or shallow (<20 ft depth) zones of highly fractured rock
 - 2. Pressure from Item 1 above plus 1.0 psi per foot of depth below top of rock
- H. If a grout hole is damaged, does not reach design depth, or is not continuously grouted as a result of equipment or mechanical difficulties, inadequate grout mix, improper drilling, or grout mixing or injection procedures, the hole shall be backfilled from the bottom up and replaced with a properly drilled and grouted hole at no cost to the Owner.

3.2 GROUT MIX DESIGN

- A. Cement based grouts shall be designed by the Contractor (for approval by the Engineer). Balanced and stable grout mixes shall have the minimum number of components required to meet the specified physical properties of a stable grout.
- B. A suite of 3 mixes shall be developed within a range of water/cement ratios of 1.5:1 to 0.5:1 by weight with no more than 5% bentonite by weight. Actual water/cement ratios will be determined

by the Contractor and approved by the Engineer. Grouts should be stable over an ambient temperature range of 50 to 85 degrees Fahrenheit. The mixes shall have the following characteristics:

	Mix A	Mix B	Mix C
Apparent (Marsh) Viscosity (sec)	36-38	50-60	>90
Bleed (%)	<1.0	<1.0	<1.0
Pressure Filtration Coefficient, K_{pf} in ($\text{min}^{-1/2}$)	<0.04	<0.04	<0.04
Unconfined Compressive Strength (psi at 28 days)	>500	>500	>600
Initial set time (hours)	>4	>3	>2
Final set time (hours)	6-12	6-12	6-12
Yield Volume (gal)	40-60	40-60	40-60

- C. The grout mix final development and testing shall be performed on-site using the Contractor's equipment and proposed water source.
- D. The Contractor shall perform the mix design testing following the proposed mix design and procedures stated in the Grouting Work Plan and with the equipment arrangement that will be used during production. Mix design testing shall be completed before starting drilling production.
1. After a batch has exhibited the proposed apparent viscosity and specific gravity properties, the Contractor shall transfer the batch to a holding tank where the grout properties will be monitored incrementally for a time of no less than 2 hours. The Contractor shall obtain a sample for testing of bleed, pressure filtration, unconfined compressive strength, and set times before sending the batch to the holding tank. If the grout mix does not meet the required characteristics as defined in Item B above then additional batches shall be mixed and tested until a mix with the required characteristics has been produced and approved. This process shall be performed for each of the Mixes A, B, and C.
 2. The Contractor shall test the line loss for each approved mix in a closed system using the exact equipment and length of pipe and packers that will be used to transfer grout from the grout header to the hole during production for flow values between 0.5 and 15 gpm. A closed system is defined here as a circulatory system where the grout is pumped from the production holding tank to the flow header, through the production grout lines and packers to a second flow header, and then back to the production holding tank. The pressure shall be recorded at each flow header. The flow headers shall be at the same elevation and the holding tank shall be higher in elevation than the flow headers. The calibration of pressure gauges and flow meters used to test line loss shall be checked before use during mix testing.
- E. The Contractor shall provide the Engineer with the mix testing results to include the following for each approved mix:
1. quantities of each grout constituent
 2. grout temperature (°F)
 3. line loss data
 4. yield of proposed mixes, in gallons
 5. material properties of each of the proposed mixes including:
 - a. Unconfined Compressive Strength (psi at 28 days)
 - b. Apparent (Marsh) Viscosity

- c. Specific gravity
- d. Water/cement ratio by weight
- e. grout temperature (°F)
- f. Initial and final set times (hours)
- g. Pressure Filtration Coefficient ($\text{min}^{-1/2}$) and filtrate volume (mL)
- h. Bleed (%) at 2 hours

3.3 SEQUENCE OF DRILLING AND GROUTING

- A. Primary holes will be drilled, tested, and grouted first, as shown on the Drawings. Secondary, tertiary, and higher order holes may be required based on field observations and as directed by the Engineer. Split spacing of grout holes may be triggered for one of the following reasons:
 - 1. An initial apparent Lugeon value of 30 or greater is observed when beginning grouting on a stage.
 - 2. Grout injection of 2.5 gal/ft injected at termination of grouting
 - 3. Surface leakage has prevented the application of the planned injection pressure.
 - 4. Communication between holes during water pressure testing or grouting.
 - 5. An anomaly is noted in the stage, such as high water pressure test value and a low grout take, or a low water pressure test value with a high grout take.
 - 6. Or as directed by Engineer.
- B. Grout holes in the downstream row shall be drilled and grouted to closure before drilling and grouting of the grout holes in the upstream row. The downstream grout holes shall be grouted to closure at a minimum distance of 60 feet (as measured horizontally along grout line) ahead of drilling and grouting of the nearest primary upstream grout hole. This minimum distance shall be measured between the closest points on the grout holes as measured parallel to the dam crest alignment.
- C. Unless approved by the Engineer, no drilling, water pressure testing, or washing of holes shall be performed within 60 feet (as measured horizontally along grout line) of a previously grouted hole until 24 hours have passed since the completion of grouting at the previously grouted hole. No drilling, washing or grouting shall be performed within 60 feet (as measured horizontally along grout line) of a hole in which water pressure testing is being performed. These distance restrictions shall be as measured between the closest points on the grout holes as measured parallel to the dam baseline.
- D. A specific interval of the grout curtain will be considered to have met closure when no further split spacing is required.

3.4 DRILLING GROUT HOLES – GENERAL

- A. Grout holes shall be drilled at the locations, depths, spacing, direction, and inclination as shown on the Drawings, subject to revisions determined by the Engineer.
- B. Grout holes drilled through the dam crest upstream of or to the left of the intake structure shall be cored. The Contractor shall operate the drill at such speeds and water pressure to ensure maximum core recovery.
- C. Rock and concrete cores shall be carefully preserved. The Contractor shall place cores into wooden boxes in the correct sequence and separated by wooden blocks that indicate the end of

each core run. The Contractor shall provide a storage area for the core boxes. The core boxes are not to be stored on the ground surface, and shall be covered from weather through the duration of the work.

- D. The Contractor shall log and alert the Engineer of any water losses, change in color of return water, rod jerks, very fast penetration rates, and other drilling experiences that will help define the nature and extent of the fracturing.
- E. For ascending-stage grouting, the holes shall be drilled to the total depths indicated and shall be water-pressure tested and grouted in stages starting at the bottom. If significant drill water is lost, if borehole stability cannot be maintained, and/or packers cannot be placed or retrieved, the partial hole shall be grouted in descending stages of not greater than 10-foot length through the problem interval. The Contractor shall notify the Engineer when hole conditions are encountered where the Contractor wants to downstage grout. The Engineer must concur with downstage grouting prior to the initiation of this approach. Re-drilling of the grouted interval may not be performed until at least 24 hours have passed since the completion of initial grouting. The Engineer may reduce the amount of time based on final set times observed during Mix Design Testing. The test stages and related pressures for descending stage grouting shall be as specified except as otherwise directed by the Engineer.
- F. When drilling has been completed, clean water shall be circulated through the hole until it is flushed free of drill cuttings. The hole shall then be temporarily capped or otherwise suitably protected to prevent surface materials from entering the hole until it is grouted. Any hole that becomes clogged or obstructed due to the Contractor's failure to protect the hole before it is grouted shall be opened and cleaned at the expense of the Contractor.
- G. During drilling, the Contractor shall maintain a driller's hole log.
- H. Unless otherwise specified, standpipe shall be installed in holes drilled through overburden prior to drilling into rock where the depth to rock is greater than 2 feet. Holes drilled in overburden shall be at least 2 inches larger in diameter than the outside diameter of the standpipe. The annular space between the borehole wall and the outside of the standpipe shall be completely grouted from the bottom up using a grout with a water/cement ratio of 0.7:1 (by weight) or less and less than 2% bleed and a method approved by the Engineer.
- I. The tolerance for grout holes shall be as follows:
 - 1. Planned locations: +/- 3 inches
 - 2. Depth: +/- 6 inches
 - 3. Deviation from angle shown on drawing: +/- 1 degrees
 - 4. Deviation from a straight boring: not more than 2 feet per 100-lineal feet of drill hole.
 - 5. Diameter: +/- ¼ inch as measured from drill bit

3.5 GROUT HOLE WASHING

- A. Each drilled grout hole shall be washed after completion of drilling and flushing through the drill bit.
- B. Washing shall begin at the bottom of a hole and shall consist of raising and lowering the flushing tool in increments of 5 feet or less until the return water is clear.
- C. If wash water is observed flowing from another grout hole the Engineer may require cross hole flushing in an attempt to flush materials from the connecting discontinuity.

- D. Sufficient water shall be made available to wash stages of the holes that intersect foundation discontinuities containing washable materials.

3.6 WATER-PRESSURE TESTING

- A. Water-pressure testing will be performed in each grout hole after hole washing and prior to grouting. Water pressure testing will typically be performed with a double-packer assembly. Testing in each borehole will be performed at the same intervals as performed during grouting.
- B. The Contractor shall control water pressures during testing of the holes so that pressures do not exceed the maximum pressure allowed for that stage to prevent hydraulic fracturing or other harmful effects on the various fractures being grouted. Damage resulting from the Contractor's operations at pressures above the allowable maximum pressure shall be repaired at no additional cost to the Owner.
- C. Five-step water pressure tests will be performed in primary grout holes and verification holes with the maximum effective water pressure equal to the maximum effective pressure used in grouting. The stepped method consists of injecting water into the rock at 3 different pressures. The first step will have a pressure of about 33% of the maximum test pressure and the second step will have a pressure of about 66% of the maximum test pressure unless otherwise directed by the Engineer. The third step will be the maximum pressure applied for the water pressure testing for each stage. The fourth and fifth steps will have the pressures of the second and first steps, respectively. If there is no water take at the maximum pressure, the fourth and fifth steps will be omitted. The pressure for steps 1 through 3 will be applied to the rock for a minimum of 5 minutes each and the pressures for steps 4 and 5 for a minimum of 3 minutes each; however, periods up to 25 minutes for some steps may be required.
- D. Single-step tests will be performed in secondary and higher order grout holes where the maximum effective pressure is applied for a period of five minutes.
- E. The recording of time for each step of a test will start after the pressure and flow have stabilized. The Lugeon value of each step will be calculated and the flow and Lugeon value shall be provided to the Engineer immediately following each test.
- F. Sufficient water volume shall be made available to develop the desired target pressure.
- G. Air shall be removed from the system prior to beginning water-pressure testing by running water through the system with the packer in the hole.

3.7 GROUT PROPORTIONING AND MIXING

- A. Grout shall be prepared using the grouting constituents, equipment, and methods approved during the Mix Design.

3.8 PRESSURE GROUTING

- A. The mixes shall be developed by the Contractor and approved by the Engineer prior to use. The Contractor shall clear the grout supply line used to send grout from the mixer to the agitator tanks after each batch is sent.
- B. In general, curtain grouting shall be accomplished in 20-foot-long stages using the ascending stage grouting technique. Imperfections identified during the drilling operations may require separate treatment as described below for descending stage grouting.

- C. The ascending-stage grouting technique shall be performed by attaching a single packer to the end of the grout supply pipe, lowering the grout supply pipe into the hole to the bottom of the bottom stage that is required to be grouted, placing a volume of grout equal to the stage volume, raising the packer to the top of the stage, setting the packer, and grouting until a termination criteria is satisfied. The packer shall then be released, a volume of grout equal to the next stage volume injected through the packer, and the packer moved by raising the grout supply pipe and packer to the top of the next stage that is required to be grouted, and thus successively grouting the hole in stages until the hole is completely grouted.
- D. Descending stage grouting shall be performed by drilling a grout hole to the depth of the bottom of the proposed grout stage, removing drill equipment, washing the descending stage, water testing the descending stage, lowering grout supply pipe into the top of the stage, inflating the packer, and grouting until refusal is met.
- E. Once grouting of any stage has begun, grouting of that stage shall continue until one of the following termination criteria is satisfied, unless otherwise directed by the Engineer:
 - 1. Refusal is achieved as defined by a grout flow rate of 0.5 gpm or less observed for a 10 minute period
 - 2. Maximum pressure cannot be achieved because of grout leaks.
- F. If, during the grouting of any hole, grout is observed flowing from adjacent grout holes, the connected hole(s) may be grouted simultaneously. If multiple holes are grouted simultaneously, the Contractor will be required to supply the specified minimum grout flow to each hole. If the holes cannot be grouted simultaneously, the hole(s) receiving communication shall be temporarily plugged with inflatable bladders or similar materials as approved by the Engineer. Where such temporary plugging is not essential as determined by the Engineer, ungrouted holes shall be left open to facilitate the escape of air and water. Where grout has entered adjacent or nearby holes, the grout pump shall be connected to these holes immediately after completion of grouting at the first hole and grouting shall be completed at the pressures specified for grouting.
- G. If, during the grouting of any hole, grout is found to flow from exposed rock, such flows or leaks shall be plugged or caulked by the Contractor using wood wedges, oakum, lead wool, or other materials as approved by Engineer.
- H. So far as practicable, only enough pressure shall be applied to a stage to allow the grout to flow freely (typically at about 5 to 10 gpm). As a safeguard against formation displacement, or while grout leaks are being caulked, the Engineer may require the reduction of the pumping pressure, changing of the grout mix, or the termination of grout pumping.
- I. In no case shall grouting pressures exceed the maximum pressure determined for grouting.
- J. If artesian conditions are encountered, grouting pressures may change per instructions of the Engineer. The Engineer may require that a packer with an attached pressure gauge be used to seal the hole at ground surface to measure artesian pressure.
- K. After the grouting of artesian holes is completed, the pressures shall be maintained by means of stopcocks or other suitable valve devices, until the grout has set sufficiently so that it will be retained in the holes or connections being grouted.
- L. It is anticipated that the injection of each stage will commence with Mix A, i.e., the lowest viscosity mix. Depending on the response of each stage during grouting (as indicated by the evolution of the apparent Lugeon value), the Engineer will instruct the progression of mix changes (i.e. to Mix B).

- M. Grout not injected into the foundation within 2 hours after mixing shall be wasted. The Engineer will have authority to increase the length of time based on grouting conditions and Marsh Cone testing at 2 hours and every thirty minutes thereafter. No payment will be made for wasted grout.

3.9 CLOSURE VERIFICATION

- A. Closure shall be verified after production grout holes have been drilled and grouted by the drilling and water-pressure testing and grouting of verification holes at locations and inclinations as directed by the Engineer. Water-pressure tests and grouting in verification holes shall be performed in the same manner as in holes drilled for production grouting. Data collected during the testing and grouting of the verification holes will be compared against the performance goal discussed in Section 1.
- B. Additional verification holes may be drilled and grouted if the specified closure criteria are not satisfied.

3.10 GROUT HOLE BACKFILLING

- A. After completing the pressure grouting of a hole, the grout hole shall be backfilled with grout, as stated below. Backfill grout shall be placed by tremie pipe from the bottom of the hole to the top of the hole. After the completion of the pressure grouting and tremie grouting of a hole, the grout level in the hole will be monitored and topped off as necessary to maintain the grout level at ground surface.
- B. All drilled holes shall be backfilled using a grout with a water/cement ratio of 0.7:1 (by weight) or less and less than 2% bleed. Backfill grout shall be placed through a pipe or hose extending to the bottom of the hole. Gradually withdraw this pipe or hose during the backfilling process. Repeat this process as many times as may be needed until the hole is completely filled with hard grout. Cut off the grout nipples or standpipe level with the adjacent surface following the Engineer's acceptance of the completed backfill.

3.11 QUALITY ASSURANCE AND QUALITY CONTROL

- A. Field Sampling and Testing
 1. The Contractor shall provide testing equipment and personnel to test grout mixes as required by the Engineer.
 2. The specific gravity of each mix used during production will be tested at a minimum of once daily. If a mix is not used on a given day, no test will be performed on the mix.
 3. The marsh viscosity will be tested for each batch that is mixed for production as practical.
 4. The testing of bleed and pressure filtration shall be tested at a minimum of one time per week for each grout mix used during that week.
 5. Additional testing of grout used in production shall be performed as required by the Engineer.
- B. Test Methods
 1. Specific Gravity using mud balance per API Recommended Practice 13B-1
 2. Apparent Viscosity using Marsh Cone per API Recommended practice 13B-1
 3. Pressure Filtration using API filter press per API Recommended Practice 13B-1
 4. Bleed using graduated cylinder per ASTM C940

5. Strength testing of cylinders prepared using ASTM C31 and tested in accordance with ASTM C39
6. Set Time (using Vicat needle apparatus, per modified ASTM C191)
7. Temperature (using thermometer, per ASTM C1064)

3.12 EQUIPMENT MAINTENANCE

- A. The Contractor shall maintain all grouting equipment in proper operating condition at all times. The pumps, grout hoses, headers, mixers, screens, and agitators shall be washed out with sufficient frequency as to ensure that no flakes or clumps of grout can enter the grout holes.
- B. The Contractor shall maintain all gauges, scales, and other measuring devices in a clean condition and proper working order, and promptly repair or replace any malfunctioning devices. Calibration checks shall be performed at the request of the Engineer.

END OF SECTION

SECTION 02374

RIP-RAP

PART 1 - GENERAL

1.01 SUMMARY

The Contractor shall furnish all labor, equipment, and materials necessary for the installation of the rip-rap in accordance with the Drawings and Specifications.

1.02 SUBMITTALS

There are no submittals required for this section.

PART 2 - PRODUCTS

2.01 RIP-RAP

The rip-rap material shall meet the following requirements:

Rip-Rap material shall be clean, hard, durable limestone and meet the Specifications for Class IA, Class II, and/or Class III, channel lining as set forth in Section 805 and Section 703 of the Kentucky Transportation Cabinet *Standard Specifications for Road and Bridge Construction*, latest edition. The size of the rip-rap shall be shown on the Drawings or as directed by the Engineer.

PART 3 - EXECUTION

3.01 INSTALLATION

The rip-rap shall be installed at the locations shown in the Drawings. Prior to installation of the rip-rap, all excavation and shaping of the channel or slope shall have been completed. The rip-rap shall be installed to the specified lines, grades, cross sections, and depths shown in the Drawings. Care shall be taken by the Contractor when placing the rip-rap on geotextiles, as to not puncture the geotextile material during the installation process.

- END OF SECTION -

SECTION 02378

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SUMMARY

The Contractor shall furnish all labor, equipment, materials, and routine maintenance for the construction of temporary erosion and sediment control measures in accordance with the Drawings and Specifications, or as otherwise directed by the Engineer.

1.02 WORK INCLUDED

- A. The Contractor shall not employ any construction method that violates a rule, regulation, guideline, or procedure established by federal, state, or local agencies having jurisdiction over the environment effect of construction.
- B. The Contractor shall take all measures necessary to control soil erosion resulting from construction operations, shall prevent the flow of sediment from the construction site, and shall contain construction materials (including excavation and backfill) within his protected working area so as to prevent damage to the adjacent wetlands and water courses.
- C. Pollutants such as chemicals, fuels, lubricants, bitumen, raw sewage, and other harmful waste shall not be discharged into or alongside of any body of water or into natural or man-made channels leading thereto.

PART 2 - PRODUCTS

2.01 SILT FENCE

- A. Silt fences shall be installed as shown on the Drawings, or as directed by the Engineer.
- B. Material

Silt Fence filter fabric shall be specifically recommended for this purpose by the manufacturer and shall meet or exceed the following criteria:

Silt Fence Filter Fabric

Property	Conformance	Specification
Bursting Strength	ASTM D 751	150 psi
Grab Strength	ASTM D 1682	100 psi
Permeability		0.02 - 0.03 cm/sec

- C. The silt fence shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0°F to 120°F.
- D. Posts for the silt fence shall be either 2-inch diameter wood or 1.33 pounds per linear foot steel with a minimum length of five (5) feet. The posts shall be set to sufficient depth to provide a sound anchor for the filter fabric. Steel posts shall have projectiles for fastening the silt fence.

2.02 ROCK CHECK DAM

- A. Rock Check Dams shall be installed as shown on the Drawings, or as directed by the Engineer.
- B. The Rock Check Dams shall be constructed of Class I channel lining.
- C. The channel lining shall be clean, hard, durable limestone and meet the Specifications as set forth in Section 805 and Section 703 of the Kentucky Transportation Cabinet *Standard Specifications for Road and Bridge Construction*, latest edition.
- D. The Rock Check Dams shall be shaped to the configuration shown in Rock Check Dam detail.
- E. The Rock Check Dams shall have a maximum height of two (2) feet.

PART 3 - EXECUTION

3.01 GENERAL

- A. All sediment and erosion control devices shall be installed prior to the initiation of site clearing and grubbing and/or excavation/construction to prevent sediment generated by the operation from escaping downstream of the work site.
- B. The Contractor shall monitor and maintain all sediment and erosion control devices throughout the construction period.

3.02 METHODS OF CONSTRUCTION

- A. The Contractor shall use any of the acceptable methods necessary to control soil erosion and prevent the flow of sediment to the maximum extent possible. These methods shall include, but not be limited to, the use of silt fences, rock checks, water diversion structures, diversion ditches, and settling basins.
- B. Construction operations shall be restricted to the areas of Work indicated on the Drawings and to the area that must be entered for the construction of temporary or permanent facilities. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow, and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of wetlands and adjacent watercourses. Such Work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, or other control devices or methods as necessary to control erosion.
- C. Excavated soil material shall not be placed adjacent to wetlands or watercourses in a manner that will cause it to be washed away by high water or runoff. Earth berms or diversions shall be constructed to intercept and divert runoff water away from critical areas. Diversion outlets shall be stable or shall be stabilized by means acceptable to the Engineer. If for any reason construction materials are washed away during the course of construction, the Contractor shall remove those materials from the fouled areas as directed by the Engineer.
- D. For Work within easements or rights-of-way, all materials used in construction such as excavation, backfill, roadway, and pipe bedding and equipment shall be kept within the limits of these easements or rights-of-way.
- E. The Contractor shall not pump silt-laden water from trenches or other excavation into wetlands, or adjacent watercourses. Instead, silt-laden water from his excavations shall be discharged within areas surrounded by sediment control measures or into sediment traps or ensure that only sediment-free water is returned to the watercourses. Damage to vegetation by excessive watering or silt accumulation in the discharge area shall be avoided.
- F. Prohibited construction procedures include, but are not limited to, the following:

1. Dumping of spoil material into any streams, wetlands, surface waters, or unspecified locations.
2. Indiscriminate, arbitrary, or capricious operation of equipment in wetlands or surface waters.
3. Pumping of silt-laden water from trenches or excavations into surface waters, or wetlands.
4. Damaging vegetation adjacent to or outside of the construction area limits.
5. Disposal of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in wetlands, surface waters, or unspecified locations.
6. Permanent or unauthorized alteration of the flow line of any stream.

3.03 SILT FENCE INSTALLATION

- A. The silt fence posts shall be installed six (6) to ten (10) feet apart on a slight angle toward the anticipated run-off source.
- B. A trench four (4) to six (6) inches deep shall be dug along the uphill side of the fence line.
- C. The silt fence shall then be attached to the posts with a maximum height of three (3) feet.
- D. The lower four (4) to six (6) inches of the silt fence shall be laid in the trench and curled toward the erosion source.
- E. The trench shall then be backfilled with any available soil.

3.04 ROCK CHECK DAM

- A. The stone for the rock check dam shall be placed in an orderly fashion and not dumped. Care shall be taken by the Contractor when placing the crushed stone on geotextiles as to not puncture the geotextile material during the installation process.
- B. The rock check dam shall have a 5(horizontal) to 1(vertical), 5:1, slope on the upstream slope and a 2.5(horizontal) to 1(vertical), 2.5:1, slope on the downstream slope.
- C. The maximum height of the rock check dam shall be two (2) feet.

- D. A non-woven geotextile shall be installed on the upstream slope of the rock check dam for filtration purposes.

3.05 MAINTENANCE

All sediment and erosion control devices shall be maintained in a sound condition during the period of construction. Accumulations of silt, which may threaten their effectiveness, shall be removed. The sediment and erosion control devices shall be inspected after each storm event. Any required repairs shall be made promptly to insure the devices continue to function properly.

- END OF SECTION -

SECTION 02920

REVEGETATION

PART 1 - GENERAL

1.01 SUMMARY

The Contractor shall furnish all labor, materials, and equipment necessary to perform all temporary and permanent revegetation of the site in accordance with the Drawings and Specifications. All areas disturbed, including Borrow Areas, shall be revegetated.

1.02 SUBMITTALS

- A. Contractor shall submit to Engineer information for the following materials:
1. Fertilizer
 2. Lime
 3. Seed
 4. Mulch
 5. Bituminous Materials for Mulch

PART 2 - PRODUCTS

2.01 EQUIPMENT

The equipment used for revegetation shall be of the Contractor's option.

2.02 MATERIALS

The materials utilized for revegetation shall meet the following requirements:

- A. Topsoil. The topsoil shall be fertile, natural soil, typical of the locality, free from large stones, roots, sticks, peat, weeds, and sod, and obtained from naturally well drained areas. It shall not be excessively acid or alkaline nor contain other toxic material harmful to plant growth. Topsoil stockpiled from other operations on-site may be used, but the Contractor shall furnish additional topsoil at his own expense, if required.
- B. Fertilizer. The Fertilizer shall be completed commercial fertilizer, 10-10-10 grade. It shall be delivered to the site in the original unopened containers each showing the manufacture's guarantee analysis, net weight, brand and

grade, and name and address of manufacturer. The fertilizer shall be stored so that when used it shall be dry and free flowing.

- C. Lime. Lime shall be agricultural ground limestone meeting the requirements as specified in Section 827 of the Kentucky Transportation Cabinet, *Standard Specifications for Road and Bridge Construction*, latest edition.
- D. Seed. Seed shall be from the same or previous year's crop. All seed shall be capable of meeting the requirements for germination, purity, and weed content as specified in Section 827 of the Kentucky Transportation Cabinet, *Standard Specifications for Road and Bridge Construction*, latest edition. The appropriate seed mixture, as specified in the following table, shall be used on the prepared surface. Seed shall be applied at a minimum rate of 4 pounds per 1,000 square feet. Seed shall be delivered in sealed containers bearing the dealer's guaranteed analysis.

Seed Species	Permanent Seed Mixtures Percent Content
Kentucky 31 Fescue <i>Festuca arundinacea</i>	70 %
Creeping Red Fescue <i>Festuca ruba</i>	15 %
Red Top <i>Agrostis alba</i>	10 %
White Dutch Clover <i>Trifolium repens</i>	5 %

- E. Mulch. Mulch materials shall consist of wheat, oat barley, or rye straw. The mulch shall not be musty, moldy, or otherwise of low quality. The use of mulch that contains noxious weeds shall not be allowed.
- F. Bituminous Materials for Mulch. The bituminous materials for mulch shall meet the requirements as specified in Section 827 of the Kentucky Transportation Cabinet, *Standard Specifications for Road and Bridge Construction*, latest edition.

PART 3 - EXECUTION

3.01 APPLICATION RATES

- A. Topsoil: Topsoil shall be placed to a minimum depth of three (3) inches on soil material and six (6) inches on rock material.
- B. Fertilizer: Fertilizer shall be applied at the rate of two (2) tons per acre.

- C. Lime: Lime shall be applied at the rate of six (6) tons per acre.
- D. Seed: Seed shall be applied at a minimum rate of four (4) pounds per 1,000 square feet.
- E. Mulch: Mulch shall be applied to a loose depth of two (2) inches, approximately two (2) tons per acre.
- F. Bituminous Materials for Mulch: Bituminous material shall be applied at a rate of 250 gallons per acre.

3.02 INSTALLATION

- A. The subgrade of all areas to receive topsoil and to be seeded shall be raked and all rubbish, sticks, roots, and stones larger than two (2) inches shall be removed. Topsoil shall be spread to a depth sufficiently greater than that of the final grade so that after natural settling and light rolling the completed grades, lines and elevations will conform to those shown in the Drawings. No topsoil shall be spread in water or while frozen or muddy.
- B. After the topsoil has been spread, it shall be prepared by loosening the topsoil to a minimum depth of three (3) inches by rotary tools, discs, harrows, or other approved methods.
- C. Lime and fertilizer shall be uniformly spread at the specified rate and immediately mixed into the full depth of the loosened topsoil.
- D. Immediately following this presentation the seed shall be uniformly applied at the specified rate and lightly raked into the surface of the topsoil. Lightly roll the surface and water with fine spray.
- E.
 - 1. All seeded areas shall be mulched following seed placement. Bituminous treated mulch shall be spread on the area seeded in a uniform manner by equipment that will not appreciably cut or break the mulch. The Contractor shall heat the bituminous material during cool weather, or as directed by the Engineer, to insure uniform distribution.
 - 2. The Contractor shall take all necessary precautions to not deface other structures with the bituminous materials. The Contractor shall be responsible to clean any other structure defaced by the bituminous materials as directed by the Engineer. This shall be done at the cost of the Contractor.

- F. The Contractor shall keep all seeded areas watered and in good condition, reseeding if, and when necessary, until a good, healthy, uniform growth is established over the entire area seeded, and shall maintain these areas in an approved condition until one year after substantial completion of the project.

- G. The Contractor shall maintain the areas in grass in a neat manner by watering, mowing, and raking clippings and leaves until the project is completed.

- END OF SECTION -

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide all labor, material, equipment, and services to complete all cast-in-place concrete work stipulated by the project, shown on the Drawings, or as herein specified. Generally, the work is to include, but not limited to, the following:
1. Entire concrete work shown on the contract Drawings.
 2. Steel reinforcement including welded wire fabric.
 3. Exterior concrete pavements, walks, and concrete curbs.
 4. Concrete accessories.
 5. Openings, pockets, chases, blockouts required, or as shown on the Drawings.
 6. Forming, finishing, curing, and patching.
 7. Construction, control, and expansion joints.
 8. Granular base course under floors and all exterior pavements as indicated.
 9. Moisture barrier under floor slab as specified.
 10. Sealing of construction joints, exterior concrete pavements, and walks.
 11. Non-shrink grout, grout, and patching mortar.
 12. Waterstops.
- B. All work shall be performed to provide homogeneous concrete having required strength, durability, weather resistance, and watertight basins without any structural defects such as, but not limited to, planes of weakness, pronounced honeycombs, voids, and air pockets.

1.02 REFERENCES (Latest Editions)

- A. ACI 211.1- Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete

- B. ACI 301 – Standard Specifications for Structural Concrete
- C. ACI 302 – Guide for Concrete Floor and Slab Construction
- D. ACI 304 – Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
- E. ACI 305R – Hot Weather Concreting
- F. ACI 306R – Cold Weather Concreting
- G. ACI 308 – Standard Practice for Curing Concrete
- H. ACI 311 – Recommended Practice for Concrete Inspection
- I. ACI 315 – Details and Detailing of Concrete Reinforcement
- J. ACI 318 – Building Code Requirements for Reinforced Concrete
- K. ACI 350R – Environmental Engineering Concrete Structures
- L. ASTM C33 – Concrete Aggregates
- M. ASTM C94 - Ready-Mixed Concrete
- N. ASTM C150 - Portland Cement
- O. ASTM C260 - Air Entraining Admixtures for Concrete
- P. ASTM C494 - Chemical Admixtures for Concrete
- Q. ASTM C618 - Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
- R. ASTM C948 - Test Method for Dry and Wet Bulk Density, Water Absorption and Apparent Porosity of Thin Sections of Glass-Fiber-Reinforced Concrete
- S. ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type)
- T. ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type
- U. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
- V. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

- W. ASTM E1155 – Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers

1.03 SUBMITTALS

A. Product Data

For each manufactured material and product utilized under this section including, but not limited to, aggregates, admixtures, method of adding admixtures, materials and method of curing, method of developing bond at joints, joint materials, waterstops, and vapor barriers.

B. Design Mixes

For each concrete mix indicated. 4,000 psi minimum design strength unless noted otherwise.

C. Shop Drawings

Include details of steel reinforcement placement including material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports. Shop drawings to include the proposed construction and control joint locations.

D. Material Certificates

E. Testing agency to perform service required in ACI 301.

F. Laboratory tests on concrete.

G. If ready-mixed concrete is used, provide the following:

1. Physical capacity of mixing plant.
2. Trucking facilities available.
3. Estimated average amount which can be produced and delivered to the site during a normal 8-hour day excluding the output to other customers.
4. Delivery Tickets: Furnish copies of all delivery tickets for each load of concrete delivered to the site. Provide items of information as specified in ASTM C 94.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications

A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

- B. Comply with ACI 301, "Specifications for Structural Concrete", including the following unless modified by the requirements of the Contract Documents.
 - 1. General requirements including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
 - 2. Formwork and form accessories.
 - 3. Steel reinforcement and supports.
 - 4. Concrete mixtures.
 - 5. Handling, placing, and constructing concrete.
- C. Conform to ACI 305R when concreting during hot weather.
- D. Conform to ACI 306R when concreting during cold weather.
- E. Acquire cement and aggregate from same source for all work.
- F. Preinstallation Conference
Conduct conference at project site if requested by Owner.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Formwork
Furnish formwork and form accessories according to ACI 301.
- B. Steel Reinforcement
 - 1. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
 - 2. Dowel Bars: Dowel bars shall be plain steel bars conforming to ASTM A 615, Grade 60, and shall be free from burring or other deformation restricting slippage in the concrete. Before delivery to the construction site, a minimum of two-thirds of the length of each dowel bar shall be painted with one coat of zinc chromate. If plastic or epoxy-coated steel dowels are used no zinc chromate coating is required, except when specified for a particular situation on the contract plans. Coated dowels shall conform to the requirements

given in AASHTO M 254. The sleeves for dowel bars used in expansion joints shall be metal, of an approved design to cover 2 to 3 inches of the dowel, with a closed end and with a suitable stop to hold the end of the bar at least 1 inch from the closed end of the sleeve. Sleeves shall be of such design that they will not collapse during construction.

3. Plain-Steel Tie Wire: ASTM A 82, as drawn.
4. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
5. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.
 - a. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - b. For exposed-to-view concrete surfaces where legs of support are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

C. Concrete Materials

1. Portland Cement: ASTM C 150, Type I or II. Air-entrained Portland cements shall not be utilized.
2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1½-inch nominal size for foundation mats, and not exceeding ¾-inch for others.
3. Water: Complying with ASTM C 94.

D. Admixtures

1. Air-Entraining Admixture: ASTM C 260.
2. Water-Reducing Admixture: ASTM C 494, Type A.
3. High-Range, Water-Reducing Admixture (Superplasticizers): ASTM C 494, Type F.
4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
6. Fly Ash: ASTM C 618, Type F.

7. General

- a. Submit method of adding mixtures.
- b. All admixtures shall be approved by the cement manufacturer.
- c. Use water-reducing admixture or high-range water-reducing admixture (superplasticizers), (ASTM C 494, type F) in concrete, as required, for placement and workability.
- d. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50°F.
- e. Use high-range water-reducing admixture in pumped concrete, architectural concrete, concrete required to be watertight, and concrete with water-cement ratios below 0.50.
- f. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minimum 1½ percent within the following limits:
 - (1) Concrete structures and slabs exposed to freezing and thawing; deicers, chemicals, or hydraulic pressure:
 - (1a) 4.5 percent (moderate exposure); 5.5 percent (severe exposure) for 1½-inch maximum aggregate.
 - (1b) 4.5 percent (moderate exposure); 6.0 percent (severe exposure) for 1-inch maximum aggregate.
 - (1c) 5.0 percent (moderate exposure); 6.0 percent (severe exposure) for ¾-inch maximum aggregate.
 - (1d) 5.5 percent (moderate exposure); 7.0 percent (severe exposure) for ½-inch maximum aggregate.
 - (2) Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent.
 - (3) Air content of trowel-finished interior concrete floor shall not exceed 3.0 percent.

- g. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

E. Form Materials

1. Forms for Exposed Finish Concrete

Plywood, metal, metal framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on Drawings.

2. Forms for Unexposed Finish Concrete

Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

3. Form Coatings

Provide commercial formulation form-coating compounds with a maximum VOC of 350 mg/L that will not bond with, stain, or adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

4. Form Ties

Factory-fabricated, adjustable length, removable, or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1½ inches to exposed surface.

F. Vapor Retarder

1. Multi-ply reinforced polyethylene sheet, ASTM E 1745, Class C, not less than 7.8 mils thick.

2. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 sieve and 10 to 30 percent passing a No. 100 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

G. Joint Filler Strip

ASTM D 1752; closed cell polyvinyl chloride or molded vinyl foam, resiliency recovery of 95 percent if not compressed more than 50 percent of original thickness. Asphalt impregnated fiberboard (ASTM D 1751) may be used with Engineer's approval.

H. Curing Materials

General curing and sealing compounds shall be clear such that the finished work maintain the concrete gray color without any noticeable discoloring.

1. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
2. Absorptive Cover: ASHTO M 182, Class 2, burlap cloth made from jute or kenaf.
3. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
4. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 209, Type 1, Class B, manufactured by Sonneborn, W.R. Meadow, The Euclid Chemical Company, or equal.
5. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound (Non-Yellowing): ASTM C 1315, Type 1, Class A, for concrete floors manufactured by Sonneborn, W.R. Meadow, The Euclid Chemical Company, or equal.

I. Concrete Construction Joint Sealants

Two-component, non-sag, polyurethane base, elastomeric sealants shall be utilized at all construction joints. Sealants shall perform properly under water submersion with no adverse chemical reactions. Joint sealants shall be Sikaflex-2C NS, manufactured by Sika Corporation, or equal. Primer shall be utilized where the joints are subjected to water submersion after cure, and other locations as instructed by the manufacturer. Installation shall be per manufacturer's instructions.

J. Self-Leveling Floor, Deck, and Sidewalk Joint sealant

1. One-part self-leveling polyurethane sealant for concrete floors, decks, sidewalks, and other horizontal contraction and expansion joints shall be Sonolastic SL1, complying with Federal Specification TT-S-0023oC, Type 1, Class A and ASTM C 920. Sealant shall be manufactured by Sonneborn or W.R. Grace Company or equal.
2. Sealant color shall be limestone or gray as selected by the Engineer unless otherwise required.

K. Joint Sealants and Backing for Sealant

1. For sealing vertical exposed faces of joint fillers, use Sonneborn-Contech Sonolastic NP1 or NP2 (one or two component urethane) or equivalent W.R. Grace Co. products, or equal. For water

immersion, prime with Sonneborn-Contech Primer No.733 for concrete and masonry or Primer No. 758 for glass and metals or as required by manufacturers of equivalent acceptable sealants.

2. For sealing horizontal exposed faces of joint fillers, use Sonneborn-Contech Sonolastic SL1, one-part, self-leveling, polyurethane sealant with Primer No. 733 or equivalent W.R. Grace Co. products, or equal.
3. Where additional sealant backing is needed to control the depth of sealant in relation to joint width, use Sonneborn-Contech Sonoflex F foam expansion joint filler or Sonofoam Backer Rod (closed cell polyethylene foam) or equivalent W.R. Grace Co. products or equal.

L. Epoxy Bonding Agent

1. Provide an epoxy-resin bonding agent, two component, polysulfide type.
2. Product and Manufacturer - provide one of the following:
 - a. Sikadur Hi-Mod LPL by Sika Corporation.
 - b. Eucopoxy LPL by the Euclid Chemical Company, or equal.

M. Patching Mortar

Use free flowing, polymer modified cementitious mortar, "Euco Thin Coat, Concrete Coat" (horizontal repairs), "verticoat" (vertical and overhead repairs) by the Euclid Chemical Company or "Sikatop 121 or 122" (horizontal repairs), "Sikatop 123" (vertical and overhead repairs) by Sika Corp.

N. Waterstop

1. Waterstops shall be Envirostop Retrofit 629 as manufactured by Westec or approved equal.
2. Waterstops shall be furnished in maximum lengths available to reduce the number of joints to the minimum.
3. Provide factory fabrications for all intersections, transitions, and changes of direction, leaving only straight butt joint splices for the field.
4. Swellable waterstops shall be as SikaSwell as manufactured by Sika or approved equal.

O. Construction Joint Devices

Integral galvanized steel, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at six (6) inches, ribbed steel spikes with tongue to fit top screed edge.

P. Non-Shrink Grout

Premixed compound consisting of non-metallic aggregate, cement, water-reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

Q. Chemical Adhesive and Expansion Anchors

Chemical adhesive and expansion anchors shall be manufactured by Hilt, Corporation, and installed per manufacturer's instructions.

2.02 CONCRETE PROPORTIONING AND DESIGNING MIXES

A. Comply with ACI 301 requirements for concrete mixtures unless otherwise specified herein.

B. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Engineer for preparing and reporting proposed mix design.

1. Do not use the same testing agency for field quality control testing.
2. Limit use of fly ash to not exceed 20 percent of cement content by weight.

C. Submit written reports to Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed.

D. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:

1. 4000 psi, 28-day compressive strength; water-cement ratio, 0.44 maximum (non air-entrained), 0.35 maximum (air-entrained).
2. 3500 psi, 28-day compressive strength; water-cement ratio, 0.58 maximum (non air-entrained), 0.46 maximum (air-entrained).

E. Water-Cement Ratio

Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:

1. Subjected to freezing and thawing: W/C 0.45.
2. Subjected to de-icers/watertight: W/C 0.40.
3. Subjected to brackish water, salt spray, or de-icers: W/C 0.40.

F. Slump Limits

Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs, and sloping surfaces: Not more than three (3) inches.
2. Reinforced foundation system: Not less than one (1) inch and not more than three (3) inches.
3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than eight (8) inches after adding admixture to site-verified 2- to 3-inch clump concrete.
4. Other concrete: Not more than four (4) inches.

G. Adjustment to Concrete Mixes

Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Owner. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Owner before using in work.

H. Ready-Mixed Concrete (Comply with ASTM C 94)

When air temperature is between 85 and 95°F, reducing mixing and delivery time from 1½ hours to 75 minutes; when air temperature is above 90°F, reduce mixing and delivery time to 60 minutes.

- I. Provide batch ticket for each batch discharged and used in the work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 – EXECUTION

3.01 INSTALLATION, GENERAL

A. Examination

1. Verify site conditions.
2. Verify requirements for concrete cover over reinforcement. Where not shown, use minimum as specified in ACI 318 and ACI 35 or whichever is deeper.
3. Verify that anchors, plates, reinforcements, and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

B. Formwork

Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.

C. Vapor Retarder

1. Install, protect, and repair vapor retarder sheets according to ASTM E 1643. Place sheets in position with longest dimensional parallel with direction of pour.
2. Lap joints six (6) inches and seal with manufacturer's recommended tape.
3. Cover vapor retarder with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minimum 3/4-inch.

D. Steel Reinforcement

1. Comply with ACI 315 and CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
2. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

E. Joints

1. Construct joints true to line with faces perpendicular to surface plane of concrete.
2. Construction Joints: Locate and install so as not to impair strength or appearance of concrete at locations indicated on the reviewed

shop drawings. Any deviation from the shop drawings shall be approved by Engineer.

3. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces such as column pedestals, foundation walls, and other locations as indicated.
 - a. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated or where joint sealants are specified. Keep top of joint filler $\frac{1}{2}$ inch lower than with finished concrete surface.
4. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated unless otherwise is shown. Construct contraction joints, where shown, for a depth equal to at least one-fourth of the concrete thickness, as follows:
 - a. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of $\frac{1}{8}$ inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
 - b. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut $\frac{1}{8}$ -inch wide joints into $\frac{1}{4}$ -inch depth of slab thickness when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

F. Tolerances

Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials".

G. Preparation

1. Prepare previously placed concrete by cleaning with steel brush and applying epoxy bonding agent in accordance with manufacturer's instructions.
2. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.02 CONCRETE PLACEMENT

- A. Comply with recommendations in ACI 304 R for measuring, mixing, transporting, and placing concrete.

- B. Do not add water to concrete during delivery at project site or during placement.
- C. Consolidate concrete with mechanical vibrating equipment.
- D. Notify Owner a minimum of 24 hours prior to commencement of operations.
- E. Ensure reinforcement, inserts, embedded parts, and formed construction and contraction joints are not disturbed during concrete placement.
- F. Separate slabs on grade from vertical surface with 1/4 to 3/8-inch joint filler unless otherwise indicated.
- G. Extend joint filler from bottom of slab to within about 1/2 inch of finished slab surface. Conform to finish joint sealer manufacturer's requirements.
- H. Install preformed metal tongue and groove joint devices, if used, in accordance with manufacturer's instructions.
- I. Apply sealants in joint devices in accordance with manufacturer's guidelines.
- J. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- K. Place concrete continuously between predetermined expansion, control, and construction joints.
- L. Do not interrupt successive placement; do not permit cold joints to occur.
- M. Provide 3/4-inch chamfers as exposed edges of concrete.
- N. Allow a minimum of three (3) days before placing concrete against a new slab or wall already in place.
- O. All embedded aluminum materials in concrete shall be coated as specified.
- P. Screed floors in accordance to ASTM E 1155 with slab-on-grade floor utilizing flatness (F_F), SOV = 25, MLV = 17, and floor levelness (F_L), SOV = 20, MLV = 15. For elevated floor utilizing flatness (F_F), SOV = 30, MLV = 24, and floor levelness (F_L), SOV = 20, MLV = 15. Measuring the levelness of elevated floors shall be while the shoring is in place. ACI 302.1R includes a construction guide on how to achieve these flatness and levelness values.

3.03 FINISHING FORMED SURFACES

A. Rough-Formed Finish

1. As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4- inch in height rubbed down or chipped off.
2. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish

1. As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.
2. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting. "Concrete surfaces exposed to public view" shall include inside walls and floors of water holding basins except for covered clearwells and covered pump station wet wells.
3. Apply smooth-rubbed finish, defined in ACI 301, to smooth-formed finished concrete.

C. Related Unformed Surfaces

At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.04 FINISHING UNFORMED SURFACES

A. General

Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straight-edge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.

1. Do not further disturb surfaces before starting finishing operations.

C. Scratch Finish

Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finish unless other indicated.

D. Float Finish

Apply float finish to surfaces to receive trowel finish and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo, or any other surfaces not specified.

E. Trowel Finish

Apply a hard trowel finish to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.

F. Trowel and Fine-Broom Finish

Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

G. Nonslip Broom Finish

Apply a nonslip broom finish to exterior concrete platforms, steps, sidewalks, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

H. Floor Drains

In areas with floor drains, maintain floor elevations at walls; slope surfaces uniformly to drains at 1:100 minimum, but not less than shown on the Drawings.

3.05 CONCRETE PROTECTION AND CURING

A. General

Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder

Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Cure formed and unformed concrete in accordance with ACI 301 and ACI 308, and for at least seven (7) days as follows:

1. Moisture-Retaining Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.06 FIELD QUALITY CONTROL

A. Testing Agency

Contractor shall engage a qualified independent testing and inspecting agency, acceptable to the Owner, to sample materials, perform tests, and submit test reports during concrete placement. All testing costs shall be borne by the Contractor. Tests will be performed according to ACI 301 except as modified herein. Contractor shall provide testing services for qualification of proposed materials and establishment of design mixture.

B. Provide free access to work and cooperate with appointed testing agency.

C. Submit proposed mix design of each class of concrete to testing firm and Engineer for review prior to commencement of work.

D. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

E. Contractor shall have a minimum of four (4) concrete cylinders taken for every 25 c.y. of concrete or discreet concrete delivery should the amount be less than 25 c.y. even though placement may be at multiple locations.

Cylinders shall be submitted to independent laboratory for testing of strength by breaking at 7 days, 14 days, and 28 days by the testing agency. Additional cylinders may be taken as deemed necessary by the Engineer and all costs shall be borne by Contractor. Cylinders shall be cured on-site in same condition as poured concrete.

- F. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. One slump test will be taken for each set of test cylinders taken.
- H. All concrete for liquid retaining structures, and all concrete in contact with earth, water, or exposed directly to the elements shall be watertight and shall be tested for leakage in accordance with ACI 3350R.

3.07 PATCHING

- A. Allow inspection of concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Owner upon discovery.
- C. Patch imperfections in accordance with ACI 301.

3.08 DEFECTIVE CONCRETE

- A. Defective Concrete

Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.
- B. Repair or replacement of defective concrete will be determined by the Owner.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Owner for each individual area.

3.09 SCHEDULE – CONCRETE TYPES

- A. Below grade footings: 4000 psi.
- B. Thrust blocks: 3500 psi.
- C. Curbing: 4000 psi.
- D. All other concrete: 4000 psi.

- END OF SECTION -

SECTION 05030

INTAKE SCREENS

1.0 GENERAL

1.1 SCOPE

- A. This section of the specifications covers the furnishing and installation of the Intake Screen System and appurtenances as shown on the drawings and specified herein.
- B. The following items are a part of the Intake Screen System section and shall be furnished by one manufacturer to ensure a properly designed and integrated intake system.
 - 1. Intake Screen assemblies of all-welded continuous slot wedge wire construction.

1.2 QUALITY ASSURANCE

- A. The entire intake screen system shall be furnished by a single manufacturer who shall comply with the following:
 - 1. The equipment manufacturer must maintain an ongoing quality assurance program, including ISO-9000 certification.
 - 2. All welders must maintain certification to ASME Section IX. Copies of certifications shall be provided upon request.
 - 3. The single manufacturer supplying this equipment must be able to furnish proof of over 25 installations of similar designs which have been in successful operation for a minimum of three years.

1.3 SUBSTITUTIONS

- A. Manufacturers other than those which are specified and/or not meeting the provisions of the specification shall be required to submit a complete and detailed PRE-QUALIFICATION PACKAGE to the engineer at least (15) days prior to the bid. The PRE-QUALIFICATION PACKAGE must contain:
 - 1. Detailed layout drawings.
 - 2. Supporting screen flow performance data via a CFD (Computational Fluid Dynamics) analysis.
 - 3. Welder certifications.
 - 4. Evidence of a recognized ongoing quality assurance program.
 - 5. Detailed component specifications and catalog cuts as required.
 - 6. Detailed list of ALL VARIATIONS from the original design, referencing appropriate sections of the specifications and locations on the drawings.

2.0 PRODUCTS

2.1 GENERAL

- A. All system components and equipment utilized in the intake screen system shall be furnished as a complete integrated system by one manufacturer.

2.2 CAPACITY

- A. Each intake screen assembly shall have a design capacity of 4,200 GPM at a maximum through-slot velocity of 0.5 feet per second. The corresponding average

through-slot velocity shall be 90% of the maximum velocity. At this flow rate the pressure drop through the clean screen surface shall not exceed 0.25 ft. H₂O. Pressure drop through the entire intake assembly shall be in the range of 0.50 to 0.75 ft. H₂O at the rated flow. The minimum water depth at the point of withdrawal is 1'-9" as measured from the reservoir bottom to the water surface.

- B. One (1) drum screen assembly shall be furnished with a total capacity of 4,200 GPM.
- C. Evidence of the intake assembly capacity and flow distribution shall be provided.

2.3 STRENGTH

- A. The intake assembly shall be designed to withstand a differential hydrostatic collapse pressure of 10 feet of water.
- B. Design stress used for determining strength of the assembly shall be no more than 90% of the published yield strength of the material used. Strength calculations verifying compliance with these criteria shall be provided upon request.

2.4 CONSTRUCTION

- A. The intake screen surface shall be produced using wedge-wire or rectangular bars.
- B. The surface wire, support beam and stiffener structure shall be an all-welded matrix designed to provide the specific strength with minimal interference with the through screen flow pattern.
- C. End plates, bottom plates, and body shall be a minimum of 0.15 inches thick. All structural butt welds shall be full penetration filler welds and shall be the thickness of the thinner component.

2.5 SLOT OPENING SIZE

- A. The maximum screen slot size shall be 1.24 inches.
 - 1. Slot size shall be controlled and continuously monitored during manufacture.

2.6 MATERIALS

- A. The intake screen material shall be manufactured of 316 stainless steel, or aluminum.
- B. The main outlet flange shall mate with a 24" flange with a flange pattern equal to AWWA C-207, Table 2, Class D.

3.0 SCREEN SUBMITTALS

3.1 SUBMITTAL INFORMATION:

- 1. Drawing(s) showing screen diameter, screen length, assembly length, interface dimensions for outlet, materials of construction and assembly weight.
- 2. Included in the intake screen submittals shall be all system sizing criteria and drawings. All dimensional and operational information will be provided. All interconnecting wiring and piping information will be included.
- 3. Three (3) copies of the O & M Manuals shall be provided.

END OF SECTION

SECTION 13109

HIGH DENSITY POLYETHYLENE (HDPE) PIPING

1.0 GENERAL

1.1 DESCRIPTION. The work in this section consists of providing High Density Polyethylene (HDPE) pipe and fittings.

1.2 RELATED WORK SPECIFIED ELSEWHERE.

A. Section 13110 – Pipe Handling and Installation

1.3 REFERENCE STANDARDS

A. AWWA M55 PE Pipe – Design and Installation

B. Plastic Pipe Institute (PPI)

C. ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings

D. AWWA C110 Ductile-Iron and Gray-Iron Fittings 3" Through 48"

E. AWWA C111 Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings

F. AWWA C906 Polyethylene (PE) Pressure Pipe and Fittings, 4" Through 63" for Water Distribution and Transmission

G. ASTM D2837 Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials

H. ASTM D3261 Specification for Butt Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing

I. ASTM D3350 Specification for Polyethylene Plastics Pipe and Fitting Materials

1.4 SUBMITTALS. Material list naming each product to be used identified by manufacturer and type number. Clearly identify the product being submitted. Additional data and information to be furnished as requested by the Engineer.

1.5 PRODUCT HANDLING. Handle pipe and fittings to insure delivery in a sound undamaged condition.

1.6 JOB CONDITIONS. Do not lay pipe when trenches or weather conditions are not suitable for such work.

2.0 MATERIALS

2.1 PIPE.

A. 2 Inches and Smaller – Pipe shall be manufactured from a PE 4710 resin listed with the Plastic Pipe Institute (PPI) as TR-4. The resin material will meet the specifications of ASTM D 3350 with a minimum cell classification of 445574C. Pipe shall have a manufacturing standard of ASTM F 714. The pipe DR shall be specified on the plans. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipes shall be suitable for use as pressure conduits, and per AWWA C 901, have nominal burst values of three times the Working Pressure Rating (WPR) of the pipe. Pipe shall also have the following agency listing of NSF 61.

B. 3 Inches and Larger - Pipe shall be manufactured from a PE 4710 resin listed with the Plastic Pipe Institute (PPI) as TR-4. The resin material will meet the specifications of ASTM D 3350 with a minimum cell classification of 445574C. Pipe shall have a manufacturing standard of ASTM F 714. Pipe O.D. sizes 4" to 24" shall be available in both steel pipe sizes (IPS) and ductile iron pipe sizes (DIPS). Pipe O.D. sizes 26" to 54" shall be available in steel pipe sizes (IPS). The pipe DR shall be specified on the plans. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipes shall be suitable for use as pressure conduits, listed as NSF 61, and per AWWA C906 Pressure Class (PC) 100 have a nominal burst value of three and one-half times the Working Pressure Rating (WPR) of the pipe. Peak flow water velocity of 5 ft/sec shall be used in the hydraulics engineering design.

2.2 FITTINGS.

A. Butt Fusion Fittings - Fittings shall be PE4710 HDPE, minimum cell classification of 445574C as determined by ASTM D 3350, and approved for AWWA use. Butt Fusion Fittings shall have a manufacturing standard of ASTM D 3261. Molded & fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified in the plans. Fabricated fittings are to be manufactured using Data Loggers. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the quality control records. All fittings shall be suitable for use as pressure conduits, and per AWWA C906, have nominal burst values of three and one-half times the Working Pressure Rating (WPR) of the fitting.

B. Electrofusion Fittings - Fittings shall be PE 4710 HDPE, minimum cell classification of 445574C as determined by ASTM D 3350. Electrofusion Fittings shall have a manufacturing standard of ASTM F 1055. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans. All electrofusion fittings shall be suitable for use as pressure conduits, and per AWWA C906, have

nominal burst values of three and one-half times the Working Pressure Rating (WPR) of the fitting.

C. Flanged and Mechanical Joint Adapters - Flanged and Mechanical Joint Adapters shall be PE 4710 HDPE, minimum cell classification of 445574C as determined by ASTM D 3350. Flanged and Mechanical Joint Adapters shall have a manufacturing standard of ASTM D 3261. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans.

3.0 EXECUTION

3.1 GENERAL. Pipe and Fittings: Size as indicated on the plans. Install as shown in accordance with manufacturer's recommendations and *AWWA Manual M55, PE Pipe-Design and Installation*.

3.2 HAULING, UNLOADING and DISTRIBUTING PIPE. During loading, transportation and unloading, every precaution shall be taken to prevent injury to the pipe. No pipe shall be dropped from cars or trucks, or allowed to roll down slides without proper retaining ropes. During transportation each pipe shall rest on suitable pads, strips, skids or blocks securely wedged or tied in place. Any pipe damaged shall be replaced.

3.3 EXCAVATION AND TRENCHING. Section 13110

3.4 FUSION.

A. Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 400-450 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 PSI. The butt fusion joining will produce a joint with weld strength equal to or greater than the tensile strength of the pipe itself. All welds will be made using a Data Logger to record temperature, fusion pressure, with a graphic representation of the fusion cycle shall be part of the Quality Control records.

B. Sidewall fusions for connections to outlet piping shall be performed in accordance with HDPE pipe and fitting manufacturer's specifications. The heating irons used for sidewall fusion shall have an inside diameter equal to the outside diameter of the HDPE pipe being fused. The size of the heating iron shall be ¼ inch larger than the size of the outlet branch being fused.

C. Mechanical joining will be used where the butt fusion method can not be used. Mechanical joining will be accomplished by either using a HDPE flange adapter with

a ductile iron back-up ring or HDPE Mechanical Joint adapter with a ductile iron back-up ring.

D. Socket fusion, hot gas fusion, threading, solvents, and epoxies will not be used to join HDPE pipe.

3.5 INSPECTION. Inspect the pipe for defects before installation and fusion. Defective, damaged or unsound pipe will be rejected.

3.6 TESTING. Pressure testing shall be conducted in accordance with ASTM F 2164, Field Leak Testing of Polyethylene Pressure Piping Systems Using Hydrostatic Pressure. The HDPE pipe shall be filled with water, flushed, raised to test pressure and allowed to stabilize. The test pressure shall be 1.5 times the operating pressure at the lowest point in the system or a minimum pressure of 50 psig whichever is greater. The pipe shall pass if the final pressure is with 5% of the test pressure for 1 hour. For safety reasons, hydrostatic testing only will be used.

3.7 DISINFECTION. Not required on this Project

4.0 MEASUREMENT AND PAYMENT

4.1 HDPE PIPE, FITTINGS AND ACCESSORIES. Payment will be included under the bid item to which the work relates.

END OF SECTION

SECTION 13110

PIPE HANDLING AND INSTALLATION

1.0 GENERAL

The CONTRACTOR shall furnish all labor, materials and equipment to install the pipelines as shown on the plans and as specified herein.

The bid documents shall show the amounts of each type and class of pipe to be provided by the CONTRACTOR.

2.0 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.

The CONTRACTOR will be required to deliver all equipment and other materials and place same as and 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 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 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.

3.0 LINES AND GRADES

The CONTRACTOR will be required to accomplish any detailed layout, including that required for establishing the grade of the pipe line.

4.0 TRENCH EXCAVATION

4.1 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, trenching machine or by hand depending on the construction area.

At the Contractor's option, trenching, by a trenching machine or by backhoe is acceptable except as noted below:

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, small 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; cutting, moving or repairing damage to fences, poles, or gates and 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. 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 tunnelling, boring, or jacking under structures, railroads, sidewalks and roads. The construction procedure for these types of excavation is described elsewhere in these specifications.

Orange Safety Fencing shall be installed and maintained by the Contractor around all open trenches or excavations at all times.

All trench excavation shall be termed unclassified and costs shall be included in the unit price bid for the pipe.

4.2 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 threes, 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 prosecute the construction and operate the facilities upon completion of construction. Trees, unless designated otherwise on the plans, shall remain and be properly protected. 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 either.

4.3 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 6 of this section. The trenches shall be excavated to a minimum of six (6) inches below the bottom of the pipe barrel in rock. In all cases where lines are under traffic a minimum cover of thirty (30") inches 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.

4.4 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 (2) feet 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 (6) inches of clearance on each side and below all pipe and fittings.

MINIMUM TRENCH WIDTH

<u>Size</u>	<u>Width</u>	<u>Size</u>	<u>Width</u>
Up to 4" Pipe	2'-0"	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"

4.5 Shoring, Sheeting, and Bracing of Excavation. Where unstable material is encountered, or where the depth of the excavation in earth exceeds five (5) feet, 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.

4.6 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.

5.0 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.

5.1 Stable Earth Foundation. On all PE or Stainless Steel 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.

Bedding of No. 9 stone, fine gravel, sand or compacted finely graded select earth shall be used to correct irregularities in the subgrade. Where bell and spigot is involved, bell holes shall be excavated to prevent the bells from being supported on undisturbed earth.

As an alternative to the above method, excavation in earth 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.

5.2 Trenches In Rock. All installation in rock will utilize the undercutting method. Bedding will be with 6 inches crushed stone as shown in the Standard Details.

5.3 Unstable Trenches. If unstable material is encountered which may not provide a suitable foundation for the pipe, the unstable material will be removed and an adequate layer of encasement concrete or other special bedding shall be placed for the pipe foundation in accordance with the Standard Details in the plans. Such "special pipe foundation" shall only be installed if directed by the ENGINEER in writing or on the plans.

6.0 PIPE LAYING

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.

At all locations where pipe is utilized, a detectable underground marking tape shall be placed in the trench approximately twelve inches below the finished grade. The tape used shall be mylar encased aluminum foil with the printing "CAUTION - Buried Water 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 blue.

7.0 BACKFILLING

Backfilling must be started as soon as practicable after pipe has been laid and joints hardened sufficiently, and jointing and alignment approved. Spading of crushed rock, sand, or mechanical tamping of earth, around pipe (as specifically required) between joints shall be the usual procedure as the laying progresses. This is in order to avoid danger or misalignment from slides, flooding or other causes. The ENGINEER shall be given a minimum of 24 hours for inspection before backfilling. The backfill shall be crushed rock, sand, or finely divided earth free from debris, organic material and stones, placed simultaneously on both sides of pipe to the same level by hand. If the line is placed in an area with vehicle traffic the backfill material must be #57 aggregate and placed from the pipe to the surface. All other areas will be filled with #57 aggregate 6" below and above the pipe with the remaining being filled with earth which will be provide by the OWNER. See details shown on the plans.

In backfilling of the lower part of the trench beginning at the top of the bedding, the backfill material shall be carefully and solidly tamped by hand or approved mechanical methods in 6" layers around the pipe and up to a point 8 inches higher than the top of the pipe. Walking or working on the completed pipe line, except as necessary in tamping or backfilling, shall not be permitted until the trench has been backfilled to a point one diameter 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 18 inches 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 6 inches 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.

Excavated materials from trenches in excess of quantity required for trench backfill shall be disposed as shown on the plans or as directed by the ENGINEER.

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 (if such surface replacement items are included in the contract) and reseeding performed.

The line CONTRACTOR shall be responsible for clean-up, grading, seeding, sodding or otherwise restoring all areas that he disturbs within the work limits of other CONTRACTORS on this project.

Any deficiency in the quantity of material for backfilling the trenches or for filling depressions caused by settlement, shall be supplied by the OWNER.

8.0 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.

Abandoned pipelines shall have the ends capped prior to backfilling or covered.

9.0 PIPE ENTERING STRUCTURES

Pipe, 4-inch diameter or larger, entering structure above original earth level, unsupported by original earth for a distance of more than six (6') feet, shall be supported by Class B concrete, where depth of such support does not exceed three (3') feet, and by Class B Concrete piers where depth exceeds three (3') feet. Concrete and reinforcing steel for such supports are to be included in the unit price of work to which it is subsidiary, and not as extra concrete, in order to discourage excessive excavation outside the limits of structures. Pipe entering structures shall have flexible joint within 16 inches of exterior of structure.

10.0 PIPE SUPPORTS AND HANGERS

The Contractor shall furnish and install all pipe hangers, inserts, brackets, plates, anchors, and other supports not specifically included under other items. Generally pipe supports are not shown on the Drawings, but shall be supplied as specified herein. However, any bracing or support details shown on the Drawings shall be followed.

Supports and hangers shall be as manufactured by Grinnell, Elcen, B-Line, or Fee & Mason, or fabricated by the Contractor. Field fabricated supports may be used only for special conditions where manufactured items may not be suitable. In such cases, details of proposed supports shall be submitted to the Engineer for review. All such supports shall be galvanized.

Except as shown on the Drawings or as directed by the Engineer, supports and hangers shall be as follows:

- A. Pipes with centerlines less than 24 inches from a wall shall be supported by a typical wall support bracket. Pipes with centerlines less than 6 feet above a floor shall be supported from below. All other pipes shall be hung from above. Piping shall be supported at no greater than 10 feet 0 inches on centers.
- B. Pipe supported from underneath shall have adjustable pipe saddle supports on properly sized pipe stanchions. The saddle assembly shall be of cast iron.
- C. Hangers are to be suspended from concrete work. Hangers shall be supported from approved metal inserts placed in concrete before the concrete is placed.
- D. All pipe hangers, inserts, clamps, supports and other like items shall be submitted for review by the Engineer prior to installation.
- E. All inside horizontal flanged piping shall be supported with approved split ring type adjustable hangers of malleable iron with suitable hanger rods unless shown otherwise on the Drawings. Special supports shall be constructed in accordance with details shown on the Drawings. Wall supports and/or hangers

shall be placed not over 10 feet apart. All piping shall be rigidly supported to prevent loosening under vibration.

- F. Pipe, valve operating stems, fixtures and conduits shall be bracketed or suspended from walls, ceilings, and beams at or near valves and fittings and where needed for firm support, by standard brackets, rods, turnbuckles, and rings made especially for pipe of sizes supported. Perforated strap iron and/or copper will not be acceptable.
- G. Clevis hangers for "iron pipe size" O.D. pipe shall be Grinnell Figure 65, Elcen Figure 12, Fee & mason Figure 239, or equal. Clevis hangers for Cast Iron O.D. pipe shall be Grinnell Figure 260, Elcen Figure 12C, Fee & Mason Figure 104, or equal.
- H. Turnbuckles shall be forged steel. Rods shall be of black steel, machine threaded of following sizes:

Pipe Size	Rod Diameter
1/2" - 2"	3/8"
2 1/2" - 3"	1/2"
4" - 5"	5/8"
6"	3/4"
8" - 12"	7/8"
14" - 16"	1"
18"	1 - 1/8"
20" - 24"	1 - 1/4"

- I. Brackets shall be of standard castings of fabricated steel and shall be reviewed by the Engineer.
- J. Column type pipe supports shall consist of pipe columns of size required to carry the full pipe and standard cast iron bases and saddles as required. Saddles shall be of proper size to fit the pipe being supported.
- K. C- Style Beam Clamps will not be accepted for hanging pipes.

11.0 OWNERSHIP OF OLD MATERIALS

Pipe - Unless otherwise indicated, all existing pipe that is to be abandoned that interferes with construction or is easily removed shall become the property of the CONTRACTOR. All pipe that is not easily removed or not required to be removed as a result of the new construction, shall be abandoned in place by this CONTRACTOR.

Pipe Line Fittings and Appurtenances - All pipe line fittings, valves, hydrants and other like appurtenances that are removed as a result of new construction shall be removed by this CONTRACTOR but shall become the property of the OWNER. All such fittings

and appurtenances 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.

Other Materials - All other materials or items that are to be removed, demolished, or abandoned as a part of this contract shall become the property of the CONTRACTOR and shall be disposed of by him.

12.0 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.

13.0 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 Owner. 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.

14.0 MEASUREMENT AND PAYMENT

Payment for supplying, transporting and storing pipe, trenching, standard bedding, pipe installation, fittings, testing, backfilling, seeding, crop damage, clean-up, tie-ins to other structures and other incidental items in this section shall be made on the basis of the unit price per lineal foot for the type and size of pipe installed, or a lump sum payment. Payment will include all those items not specifically covered by another proposal. Pipe will be measured along the centerline of the pipe as installed with no deduction for valves and fittings.

END OF SECTION

SECTION 13120

INSTALLATION OF WATER LINE ACCESSORIES

1.0 GENERAL

The CONTRACTOR is to supply and install all valves, hydrants, blowoffs and other equipment at the locations shown on the plans in complete accordance with these specifications.

2.0 MATERIALS

2.1 Fire Hydrant. All fire hydrants shall have a six inch bell connection, shall have two hose outlets and one pumper connection, shall be designed for 250 pounds working pressure or 300 pounds hydrostatic pressure and shall conform to the latest specifications of the AWWA C502. All working parts shall be bronze. Both hose outlets shall be 2 1/2 inch with NST threads and the pumper outlet shall be 4 1/2 inch with NST thread. Hydrants shall be designed so that no water will be lost when they are broken off and so they can be repaired with a repair kit. Design, materials, and workmanship shall be similar and equal to the latest stock pattern ordinarily produced by the manufacturer. Length of barrel shall be such to provide a 3 1/2 foot bury depth. Working drawings and full description of hydrants shall be submitted to the ENGINEER before ordering. All hydrants shall have a 5 1/4 inch valve opening against pressure. The hydrants shall be equal to Mueller Model A423 or equal. All hydrant extensions will be the responsibility of the CONTRACTOR.

2.1.1 Paint. Hydrants shall be painted one coat of red paint and two finish coats of approved paint of color directed by the ENGINEER. All hydrants are to receive the final coat of paint after field installation.

2.2 GATE VALVE

All gate valves shall be the resilient seat-type, iron body, non-rising stem, fully bronze mounted, and suitable for working water pressures of not less than 200 psi for installations on PVC pipe and not less than 250 psi for installations on DI pipe. 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 C-509. Valves shall be furnished with flanged connections for exposed piping and push-on or mechanical joint connections for buried service. Gate valves shall have a clear water way equal to the nominal diameter, and shall be opened by turning counter-clockwise. The operating nut or wheel shall have an arrow cast in the middle, indicating the direction of opening. Each valve shall have the maker's initials, pressure rating and the year in which manufactured, cast on the body. Prior to shipment from the factory each valve shall be tested by hydraulic pressure of at least 300 pounds per square inch.

2.3 BUTTERFLY VALVE

All butterfly valves shall be of tight closing, resilient seat type with seats securely fastened to valve body. No metal-to-metal seating surfaces will be permitted. Valves shall be bubble tight at the rated pressure in either direction and shall be satisfactory for applications involving throttling service and/or frequent operation and for applications involving valve operation after long periods of inactivity.

Valves shall be suitable for working water pressure of 200 psi unless otherwise specified or noted on the plans.

Cast Markings: valve size, manufacturer's name, class, direction of opening, and year of casting.

The valve discs shall rotate 90° from the full open position to the tight shut position.

The valve discs shall be cast/ductile iron with a welded nickel edge free of ribbing or protrusions which may collect solids. The disc-to-shaft connections shall be via polished 316 SS pins. Sprayed or plated discs are not acceptable. All disc seating edges shall be smooth and polished.

The shafts shall be turned, ground and polished, and be of one-piece construction. The shafts shall also be constructed from stainless steel with diameters per AWWA C504, Class 75B.

The shaft seals shall be of Hycar or Hypalon and shall be provided to prevent leakage into the bearing chest areas.

The valve bearings shall be Teflon coated, self-lubricating, stainless steel design and construction.

The valve seats shall be Neoprene or Hypalon and shall be simultaneously molded, vulcanized and bonded to the valve body or a rigid reinforcing ring.

2.3.1 Operators. The valve operating mechanisms shall be for counterclockwise opening. There shall be no external moving parts on valve or operator except the operator input shaft. Input shaft is to be operated by a 2-inch square operating nut. Maximum required input force on the operator shaft to open and close the valve shall be 40 pounds. The total number of turns applied to the operating nut required to completely open the valve from a completely closed position shall be not less than twice the nominal valve diameter. An extension stem shall be furnished if required to bring the operating nut within 3 1/2 feet of finished grade. Extension stems shall be securely fastened to the valve stem. A stainless steel collar, 6-inches high, shall be welded to the operating gear box housing centered on the operating nut to hold the valve box in place and seal it against dirt. The diameter of the collar shall be such that it will accept the valve box.

The valves shall be manufactured by M & H, Dresser, Dezurik or approved equal.

2.4 AIR RELEASE VALVES

A valve designed to allow exhaust of small pockets of air from the water main while in use shall be installed where shown on the plans or where directed by the ENGINEER. The air release valve shall have a 3/4" iron pipe thread inlet, cast iron body construction, bronze trim, with all internal parts of stainless steel. The valve shall have a minimum orifice size of 3/32". Valves shall be suitable for a working water pressure of 150 PSIG. The air release valve shall be mounted on 3/4" bronze riser pipe. The riser pipe shall be connected to the water main by use of a service clamp and a corporation stop. The riser shall also have a 3/4" bronze ball valve with stainless steel handle and be suitable for a 150 PSIG working water pressure. Air release valves shall be as manufactured by APCO Models 65 or 50, or approved equal.

Air release valves will be installed in the same type of box used for meter installation. The box must allow for adequate cover over the pipe at the installation.

In locations where the air release valve can not be placed directly above the water main, such as roadway drainage ditches, then a section of service tubing shall be used to locate the valve as directed by the ENGINEER. The service tubing shall be installed with a continuous upward slope to eliminate air pockets. Additional payment for the tubing shall be made based on the linear foot bid for service tubing. Tubing shall also be rodded through the box to support the valve. No additional payment will be made for the tubing supports.

2.5 VALVE BOXES

All valves (gate, air release, check, etc.) installed underground shall be installed in an approved valve box. Each gate valve shall be installed in a vertical position with a valve box. Valve boxes shall be of a cast iron, two or three-piece, slip-type consisting of a base, a center section and a top section with a cover marked "water". Where valve box is constructed in a paved area the box shall be a screw type box. The entire assembly shall be adjustable for elevation and shall be set vertically and be properly adjusted so that the cover will be in the same plane as the finished street surface (no more than 1/2" above ground in yards or pastures or 2" in unsodded areas). The assembly must provide for the required cover over the pipe at the installation site and shall rest on concrete pads as shown in the Standard Details. The CONTRACTOR shall furnish two (2) valve wrenches for the project.

2.6 BLOW-OFF VALVES

Blow-off valves shall be installed in accordance with the details and the specifications at locations shown on the plans and in other locations as directed by the ENGINEER. The CONTRACTOR should refer to the Standard Details for blow-off installation.

The blowoff pipe from the main to the flush valve shall be connected to the main by means of a tee. Do not use a corporation stop for this connection. The gate valve for the blow-off connection shall be a resilient seat gate valves in conformance with AWWA C509.

2.7 TAPPING SLEEVE AND VALVE

Tapping sleeves shall be as manufactured by Ford Meter Box Company, Inc., Model FTSC, or approved equal, and shall be rated for a minimum working water pressure of 150 psi. CONTRACTOR shall ascertain the type and size of pipe to which the connection is to be made prior to selection. The valve shall be as specified under Section 2.2 of this specification.

3.0 EXECUTION

3.1 FIRE HYDRANTS

Under this Item, the CONTRACTOR shall provide all labor, tools, equipment and materials to furnish and install hydrants with gate valves as shown on the drawing and as directed by the ENGINEER.

Hydrants shall be set at such elevations that the connecting pipe will have the same depth of cover as the distribution main. The back of the hydrant opposite the pipe connection shall be firmly wedged against one and one-half square feet or enough of the vertical face of the trench with concrete to prevent the hydrants from blowing off the line. In addition, all fittings, valves and hydrants shall be joined by the use of all-thread rods, nuts and "DUC-LUG" offsets as shown on the attached drawing to prevent movement of the hydrant. If the character of the soil is such, in the opinion of the ENGINEER, that the hydrant cannot be securely wedged, bridle rod collars shall be used which shall be not less than three-fourths inch stock and shall be protected by a coat of acid resistant paint.

Not less than seven cubic feet of No. 9 stone shall be placed around the base of the hydrant to insure drainage. Before the No. 9 stone is placed and before it is backfilled the drain hole shall be inspected and thoroughly cleaned if necessary. The backfill around the hydrant shall be thoroughly compacted to the grade line in a manner satisfactory to the ENGINEER. Hydrants shall have the interior cleaned of all foreign matter before installation.

All hydrants will be installed with the pumper connection facing the main access road or as directed by the ENGINEER.

Stuffing boxes shall be tightened and the hydrants shall be inspected in open and closed position to see that all parts are in working condition.

3.2 VALVES

Underground valves shall be nut operated, unless otherwise shown on the plans. Valve supplier shall furnish two standard stem iron wrenches for turning nut operated valves. All underground valves which have nuts deeper than 30 inches below the top of valve box shall have extended stems with nuts located within 2 feet of valve box cap. Buried service valves shall have either epoxy-coated or tar-coated exteriors.

Exposed service valves shall be equipped with an AWWA approved handwheel operator. The exterior of exposed valves shall be epoxy-coated, tar-coated, or as specified on the DRAWINGS.

3.3 TIE-IN CONNECTIONS

All tie-in connections shall include a valve if shown on the plans. The valve shall be as specified under Section 2.2 of this specification. The tie-in shall include all fittings and materials suitable to make the required connection. The fittings shall be mechanical joint, ductile iron type as specified in other sections of the Technical Specifications.

4.0 **PAYMENT**

Payment of the unit price bid for fire hydrants shall constitute full compensation for furnishing and installing the fire hydrants with associated tees, gate valve and incidental items as specified.

Payment for gate valves, air release valves, check valves and other special valves installed underground shall include all work necessary for a complete installation and shall include all valve stem boxes or other valve boxes and box covers. Payment will be made at the unit price bid for the type and size of valve installation.

Blowoff Assemblies will be paid for under their respective bid prices and such payment is to include the gate valve setting, boxes and six feet (6') of pipe. Any additional pipe required will be paid under bid price for pipe installed.

Payment for tapping sleeve and valves and for tie-ins shall constitute full compensation for furnishing and installing the connection and shall include all work necessary for complete installation and any incidental items as specified.