

**1,000,000 GALLON ELEVATED TANK**

**JESSAMINE COUNTY WATER DISTRICT No. 1  
WATER SYSTEM IMPROVEMENTS  
JESSAMINE COUNTY, KENTUCKY**

**TECHNICAL SPECIFICATIONS AND  
CONTRACT DOCUMENTS**

**JANUARY 2015**



**Prepared By:**



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1. Bid Schedule
2. Bid Bond
3. RUS Certification for Contracts Grants and Loans
4. RUS Certification Regarding Debarment
5. RUS Compliance Statement

ADVERTISEMENT FOR BIDS

WATER SYSTEM IMPROVEMENTS  
JESSAMINE COUNTY WATER DISTRICT No. 1  
JANUARY 2015

Sealed proposals for the following work will be received by the Jessamine County Water District No. 1 at the District Office, 2225 Lexington Road, Nicholasville, KY 40356 until 11:00 AM (local time) February 24, 2015, for furnishing labor and materials and performing all work as set forth in this Advertisement for Bids, General Conditions, Specifications and/or Drawings prepared by HMB Professional Engineers, Inc., 3 HMB Circle, US 460, Frankfort, KY 40601, (502) 695-9800.

Immediately following the scheduled closing time for the reception of bids, all proposals which have been submitted in accordance with the above conditions will be publicly opened and read aloud.

The work to be bid upon is described as follows:

Furnish, install and place into operation:

- New 1,000,000 Gallon Elevated Storage Tank
- New 600 GPM Underground Booster Pump Station
- Approximately 1,500 Linear Feet of 12" PVC Water Line
- New Control Valve and Vault
- SCADA System
- New Backflow Preventer and Vault
- All Related Appurtenances

Drawings, Specifications and Contract Documents may be examined at the following places:

Jessamine County Water District No. 1, 2225 Lexington Road, Nicholasville, KY 40356

HMB Professional Engineers, Inc., 3 HMB Circle, Frankfort, KY 40601

Builder's Exchange of Louisville, 2300 Meadow Drive, Louisville, KY 40218

Builder's Exchange of Lexington, 1035 Strader Drive, Suite 100, Lexington, KY 40505

McGraw Hill Dodge/AGC Planroom, 950 Contract Street, Suite 100, Lexington, KY 40505

McGraw Hill Dodge/AGC Planroom, 1811 Cargo Court, Louisville, KY 40299

Director of Minority Business, Small and Minority Business Division, Cabinet for Economic Development, Capital Plaza Tower, Frankfort, KY 40601

or may be obtained from Lynn Imaging, 328 Old East Vine Street, Lexington, KY 40507, (859) 255-1021 upon receipt of a non-refundable payment as follows:

Jessamine County Water District No.1  
Water System Improvements

\$75 per set paper or \$40 PDF format

Note: Additional shipping and/or handling charges may apply and will be the responsibility of the Bidder.

After Award of a Contract, the General Contractor will be furnished, without charge, a reasonable number of plans and specifications needed to prosecute the work. Subcontractors, manufacturers and suppliers shall obtain plans and specifications from the General Contractor, or through Lynn Imaging.

Sealed proposals for the Contract shall be clearly marked on the outside of the container as follows:

"Sealed proposal for Jessamine County Water District No. 1 – Water System Improvements

Not to be opened until 11:00 AM (local time) February 24, 2015."

"The following Addenda have been received and considered in the enclosed proposal:"

Addendum No. \_\_\_\_\_ Addendum No. \_\_\_\_\_ Addendum No. \_\_\_\_\_

Time allowed for completion of Contract is: 270 consecutive calendar days.

If forwarded by mail, the sealed envelope containing the proposal must be enclosed in another envelope and mailed to the Jessamine County Water District No. 1, 2225 Lexington Road, Nicholasville, KY 40356 allowing sufficient time for such mailing to reach this address prior to the scheduled closing time for the receipt of proposals.

Bids shall be accompanied by a certified check or bid bond payable to the Jessamine County Water District No. 1 in an amount not less than five percent (5%) of the base bid. No bidder may withdraw his bid for a period of ninety (90) days after the date bids are opened. He may, however, withdraw his bid at any time prior to the time and date scheduled for opening of same or any authorized postponement thereof. Any bid received after the time and date specified will not be considered and will be returned unopened to the bidder.

The Jessamine County Water District No. 1 reserves the right to reject any and all bids and to waive formalities and any bid that is apparently unbalanced may be rejected.

Bidders must comply with the President's Executive Order Nos. 11246 and 11375, which prohibit discrimination in employment regarding race, creed, color, sex, or national origin. Bidders must COMPLY WITH Title VI of the Civil Rights Act of 1964, the Anti-Kickback Act, Section 3 Segregated Facilities, Section 109 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 the basis of race, color, creed or national origin.

Federal law prohibits discrimination on the grounds of race, color, national origin, religion, age, handicap, and sex in this project. Minority firms are particularly encouraged to participate.

Carl Waits  
Chairman





## INSTRUCTION TO BIDDERS

BIDS will be received by (herein called the "OWNER"), at See Advertisement until See Advertisement, and then at said office publicly opened and read aloud.

Each BID must be submitted in a sealed envelope, addressed to See Advertisement at See Advertisement. Each sealed envelope containing a BID must be plainly marked on the outside as BID for See Advertisement and the envelope should bear on the outside the BIDDER'S name, address, and license number if applicable, and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER at See Advertisement.

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within 90 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID Schedule by examination of the site and a review of the drawings and specifications including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

The OWNER shall provide to BIDDERS prior to BIDDING, all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve the contractor from fulfilling any of the conditions of the contract.

Each BID must be accompanied by a BID bond payable to the OWNER for five percent (5%) of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible BIDDERS. When the Agreement is executed the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the payment BOND and performance BOND have been

executed and approved, after which it will be returned. A certified check may be used in lieu of a BID BOND.

A performance BOND and a payment BOND each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract. Performance BOND must be valid for one year beyond date of acceptance of the completed project.

Attorneys-in-fact who sign BID BONDS or payment BONDS and performance BONDS must file with each BOND a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the performance BOND and payment BOND within ten (10) calendar days from the date when NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary Agreement and BOND forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

The OWNER within ten (10) days of receipt of acceptable performance BOND, payment BOND and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by WRITTEN NOTICE withdraw the signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER AND CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

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 Agreement and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

Award will be made to the lowest, responsive, responsible BIDDER.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to its BID.

Further, the BIDDER agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the SUPPLEMENTAL GENERAL CONDITIONS.

The low BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when required to do so by the OWNER.

The ENGINEER is HMB Professional Engineers, Inc. The ENGINEER'S address is 3 HMB Circle, US 460, Frankfort, KY 40601.



BID SCHEDULE  
1,000,000 GALLON ELEVATED TANK  
WATER SYSTEM IMPROVEMENTS PROJECT  
JESSAMINE COUNTY WATER DISTRICT NO. 1  
JESSAMINE COUNTY, KENTUCKY  
DECEMBER 2014

Proposal of \_\_\_\_\_ (hereinafter called "BIDDER"), organized and existing under the laws of the State of \_\_\_\_\_ doing business as \_\_\_\_\_ \* to the Jessamine County Water District No. 1 (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all work for the construction of Water System Improvements Project, 1,000,000 Gallon Elevated Tank in strict accordance with the Contract Documents, within the time set forth therein, and at the prices stated below.

By submission of this bid, each BIDDER certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that this bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this bid with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence work under this contract on or before a date to be specified in the Notice to Proceed and to fully complete the project within **270** consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of **\$1,000.00** for each consecutive calendar day that the work remains incomplete after the expiration date of the contract.

BIDDER acknowledges receipt of the following Addenda:

Addendum No. \_\_\_\_\_ Addendum No. \_\_\_\_\_ Addendum No. \_\_\_\_\_

The BIDDER hereby proposes to furnish and do all that is required by the contract to which this refers for the construction of all structures listed at the prices shown for each bid item on the following Bid Schedule. (The Bid Schedule attached lists the various divisions of construction contemplated in the Plans and Specifications, together with an estimate of the units of each. With these units as the basis, the BIDDER will extend each item, using the cost he inserts in the unit column. Any total cost found inconsistent with the unit cost when the bids are examined will be deemed in error and corrected to agree with the unit cost which shall be considered correct).

\*Insert "a corporation", "a partnership", or "an individual" as applicable.

The undersigned BIDDER does hereby declare and stipulate that this proposal is made in pursuance of and subject to all terms and conditions of the Instructions to Bidders, the Construction Contract, the Technical Specifications, and the Plans pertaining to the work to be done, all of which have been examined by the undersigned.

Accompanying this proposal is a certified check or standard bid bond (5% of the Total Bid) in the sum of \_\_\_\_\_ dollars and \_\_\_\_\_ cents (\$\_\_\_\_\_) in accordance with the Instructions to Bidders.

The undersigned BIDDER agrees to execute the contract and Performance and Payment Bond for the amount of the total of this bid within 10 calendar days from the date when the written Notice of Award of the contract is delivered to him at the address given in this proposal. The name and address of the corporate surety with which the BIDDER proposes to furnish the specified Performance and Payment Bond is as follows:

\_\_\_\_\_  
\_\_\_\_\_

All the various phases of work enumerated in the Technical Specifications with their individual jobs and overhead, whether specifically mentioned, included by implication or appurtenant thereto, are to be performed by the Contractor under one of the items listed in the Bid Schedule, irrespective of whether it is named in said list.

Payment for work performed will be in accordance with the Bid Schedule, subject to changes as provided for the Construction Contract.

The BIDDER understands that the OWNER reserves the right to reject any or all bids and to waive any informalities in the bidding.

The BIDDER agrees that this bid shall be good and may not be withdrawn for a period of 90 calendar days after the scheduled closing time for receiving bids.

Bids shall include sales tax and all other applicable taxes and fees.

The BIDDER is *strongly encouraged* to closely review the Special Conditions and Instructions to Bidders. Submittal of Bid shall constitute acknowledgement by the Bidder of the contents of these sections, as well as the contents of the entire Contract Documents.

The following Bid Items include a general description of each Item. Detailed information of the work to be included may be found in the various sections of the Contract Documents.

BID SCHEDULE

**Water System Improvements Project - 1,000,000 Gallon Elevated Tank**

<u>Item No.</u>	<u>Item Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
1	1,000,000 Gallon Elevated Tank, including Tank, Tank Foundation, Overflow Line, Splash Pad, Site Preparation and Restoration, Excavation, and all Appurtenances, as Shown on the Plans and Specifications, Complete in Place	1	LS	\$ _____	\$ _____
2	Tank Valve Vault and Associated Piping, including Unclassified Excavation, Installation, Valves, Interior and Exterior 12" DIP Piping, Bypass 12" DIP Piping, 12" DIP Piping from Fence to Vault, Fire Hydrant, Sump Pump and Electrical Service, and all Required Appurtenances, as Shown on the Plans and Specifications, Complete in Place	1	LS	\$ _____	\$ _____
3	Roof Corral/Handrail Including all Materials, Installation and Coatings, as described in the Contract Documents and Shown on the Plans, Complete in Place	1	LS	\$ _____	\$ _____
4	Tank Containment During Surface Preparation and Painting, including all Materials and Labor, as Described in the Contract Documents, including Installation and Removal	1	LS	\$ _____	\$ _____
5	Tank Sign Application and Coatings as Described in the Contract Documents, Complete in Place	1	LS	\$ _____	\$ _____
6	Tank Site Fencing Including all Materials and Labor for Installation as Described in the Contract Documents, Complete in Place	1	LS	\$ _____	\$ _____
7	Tank Access Road as Described in the Contract Documents and Geotechnical Report and as Shown on the Plans, Including all Required Unclassified Excavation, Labor and Materials and Removal if Required by Property Owner, Complete in Place	1	LS	\$ _____	\$ _____

8	1,000,000 Gallon (nominal) Water Storage Tank Interior Coatings Including, but not Limited to: SSPC-SP 10 Blast, Coatings and Application, Up to 50 LF of Sikaflex-1a Calking, Sterilization, Site Clean Up, all Incidental Work Necessary to Place the Tank into Operating Condition, Providing all Materials, Tools, Equipment and Labor Necessary to Paint the Interior in Accordance with the Contract Documents, Complete in Place	1	LS	\$ _____	\$ _____
9	1,000,000 Gallon (nominal) Water Storage Tank Exterior Coating including, but not limited to: SSPC-SP 6 Blast, Specified Coatings and Application, Site Clean Up, All Incidental Work Necessary to Place the Tank into Operating Condition, Providing all Materials, Tools, Equipment and Labor Necessary to Paint the Exterior in Accordance with the Contract Documents, Complete in Place	1	LS	\$ _____	\$ _____
10	Sika-Flex 1a Caulking, Including Installation, Labor and Materials	5	Tube	\$ _____	\$ _____
11	Tank Mixing System Including, but not Limited to: Mixing System Components, Specified Tank Interior Surface Preparation as Required, Coatings and Application (if Required), Site Clean Up, all Electrical and Other Incidental Work Necessary to Provide a Fully Functional System, Providing all Materials, Tools, Equipment and Labor Necessary to Install the System in Accordance with the Contract Documents Section 11730, Complete in Place	1	LS	\$ _____	\$ _____
12	12" PVC, Class 200 Pipe, SDR-21, Furnishing, Trenching, Installing and Backfilling (Unclassified Excavation)	1,600	LF	\$ _____	\$ _____
13	12" CI AWWA NRS Gate Valve and Box, Conc. Pad, Complete in Place	6	EA	\$ _____	\$ _____
14	8" CI AWWA NRS Gate Valve and Box, Conc. Pad, Complete in Place	1	EA	\$ _____	\$ _____



15	12" x 6" Water Line Connection Including all Labor, Materials, Fittings, Gate Valves, Tapping Tees, Piping and any Other Appurtenances as Required, Complete in Place as Shown on Sheet 7 of the Plans and as Described in the Contract Documents	1	LS	\$ _____	\$ _____
16	24" Steel Casing Pipe by Open Cut, Furnishing and Installing Under State and County Maintained Roads, Including Unclassified Excavation (Water Pipe Not Included)	60	LF	\$ _____	\$ _____
17	Relocate Existing Fire Hydrant Complete in Place, Including Required Fittings and Appurtenances	1	LS	\$ _____	\$ _____
18	No. 10 Solid Copper Tracer Wire with Plastic Insulation and Sealed Splices to be Taped to the Top of all Water Mains, Complete in Place	1,600	LF	\$ _____	\$ _____
19	#57 Crushed Stone on Trench Surface, Full Depth on Driveways, Roadway Crossings	50	LF	\$ _____	\$ _____
20	#9-M Crushed Stone Bedding in Areas of Rock Excavation	50	TON	\$ _____	\$ _____
21	Bituminous Paving Replacement on State and County Maintained Roads and Driveways Including Gravel Backfill	10	LF	\$ _____	\$ _____
22	Concrete Paving Replacement, Including Gravel Backfill	10	LF	\$ _____	\$ _____
23	Control Valve and Vault, Complete in Place, Including all Required Labor and Materials, Fittings, Valves, Sump Pump, Electric Service, Unclassified Excavation and Appurtenances to Place into Service in Accordance with the Plans and Contract Documents	1	LS	\$ _____	\$ _____
24	Backflow Preventer and Vault, Complete in Place, Including all Required Labor and Materials, Fittings, Valves, 4" Drain Piping and Flap Valve, Unclassified Excavation and Appurtenances to Place into Service in Accordance with the Plans and Contract Documents	1	LS	\$ _____	\$ _____

- 25 Videotape Project Area, Including all Labor and Materials Required in Accordance with the Contract Documents      1      LS      \$ \_\_\_\_\_ \$ \_\_\_\_\_
  
- 26 Booster Pump Station Complete in Place, Including all Required Unclassified Excavation, Foundation, Electric Service, Backflow Preventer, Site Restoration, Access Road, Fittings, Valves and Appurtenances in Accordance with the Plans and Contract Documents      1      LS      \$ \_\_\_\_\_ \$ \_\_\_\_\_
  
- 27 SCADA SYSTEM  
 Furnish and Install all Required Labor and Materials, Including Unclassified Excavation, any Required Electrical Components or Upgrade, Mounting Boards/Brackets, Transducers, Wiring, Switches, etc. for a Complete and Fully Functional SCADA System Complete in Place, as Described in the Contract Documents and Shown on the Plans      1      LS      \$ \_\_\_\_\_ \$ \_\_\_\_\_

**TOTAL BID**      \$ \_\_\_\_\_  
 (Items 1 through 27)

The total sum of the Bid Items 1 through 27 shall be the basis upon which the Contract shall be awarded to the lowest responsive, responsible bidder. The BID amount shall be written both in words below and numerically above. In case of a discrepancy, amount shown in words will govern. THE BIDDER'S TOTAL SUM BASE BID FOR ITEMS 1 THROUGH 27 IS:

\_\_\_\_\_ DOLLARS

AND \_\_\_\_\_ CENTS (\$ \_\_\_\_\_ )

The OWNER reserves the right to, at his sole discretion, accept or reject any or all ALTERNATE BIDS to structure the project to his maximum advantage. Doing so will in no way impact or alter the evaluation of the BASE BID, which shall be the basis for Award of the Contract.

Base Bid Method of Payment shall be by lump sum based upon an approved estimated percentage complete of each bid item. Contractor should review the Standard Details and the Specifications, especially the Special Conditions, when bidding this project.

Upon request, the lowest responsive, responsible BIDDER may be allowed to submit a Schedule of Values upon Contract Award for approval by the ENGINEER/OWNER for any Lump Sum Bid Items as further basis for Measurement and Payment of that Item during construction.

The above prices shall include all labor, materials, excavation, permitting, shoring, removal, clean up, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for, complete in place.

\_\_\_\_\_  
(Bidder Firm Name) (Date)

By \_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Phone Number & E-mail)

\_\_\_\_\_  
(Business Address)



# 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):

Jessamine County Water District No.1  
2225 Lexington Road  
Nicholasville, KY 40356

**BID**

Bid Due Date: February 24, 2015  
Project (Brief Description Including Location):  
1,000,000 Gallon Elevated Tank  
Water System Improvements  
Jessamine County, KY

**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 FOR CONTRACTS, GRANTS AND LOANS

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

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

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

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

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

\_\_\_\_\_  
(name)

\_\_\_\_\_  
(date)

\_\_\_\_\_  
(title)





**U.S. DEPARTMENT OF AGRICULTURE**

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**Certification Regarding Debarment, Suspension, Ineligibility  
and Voluntary Exclusion - Lower Tier Covered Transactions**

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

**(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)**

- (1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

---

Organization Name

PR/Award Number or Project Name

---

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

---

Signature(s)

Date

**Instructions for Certification**

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all lower tier covered transaction and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**USDA  
Form RD 400-6  
(Rev. 2-98)**

**COMPLIANCE STATEMENT**

This statement relates to a proposed contract with \_\_\_\_\_

Jessamine County Water District No. 1 – Water System Improvements, 1,000,000 Gallon Tank  
(Name of borrower or grantee)

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

1. I  have,  have not, participated in a previous contract or subcontract subject to Executive Order 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.
2. If I have participated in such a contract or subcontract, I  have,  have not, filed all compliance reports that I have been required to file in connection with the contract or subcontract.

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

3. I  have,  have not previously had contracts subject to the written affirmative action program requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract, I  have,  have not, developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

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

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

Position 6

**RD 400-6 (Rev. 2-98)**

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

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

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

*Date* \_\_\_\_\_

\_\_\_\_\_  
*Signature of Bidder or Prospective Contractor*

\_\_\_\_\_  
*Address (including Zip Code)*

# Notice of Award

Dated \_\_\_\_\_

Project: <b>Water System Improvements</b>	Owner: <b>Jessamine County Water District No.1</b>	Owner's Contract No.:
---	--	-----------------------

Contract: <b>1,000,000 Gallon Elevated Tank</b>	Engineer's Project No.: <b>4099.00/.15</b>
---	--

Bidder: \_\_\_\_\_

Bidder's Address: (send Certified Mail, Return Receipt Requested) \_\_\_\_\_

You are notified that your Bid dated \_\_\_\_\_ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for Water System Improvements, 1,000,000 Gallon Elevated Tank

The Contract Price of your Contract is \_\_\_\_\_ Dollars (\$\_\_\_\_\_).

Seven (7) copies of each of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

A Reasonable Number of sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within [15] days of the date you receive this Notice of Award.

1. Deliver to the OWNER seven (7) fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders (Article 20), [and] General Conditions (Paragraph 5.01) [and Supplementary Conditions (Paragraph SC-5.01).]
3. Other conditions precedent:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

Within ten days after you comply with the above conditions, OWNER will return to you one fully executed counterpart of the Contract Documents.

\_\_\_\_\_  
Jessamine County Water District No.1  
Owner

By: \_\_\_\_\_  
Authorized Signature  
\_\_\_\_\_  
Chairman  
Title

Copy to Engineer



**AGREEMENT  
BETWEEN OWNER AND CONTRACTOR  
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)  
FUNDING AGENCY EDITION**

THIS AGREEMENT is by and between \_\_\_\_\_ Jessamine County Water District No.1 \_\_\_\_\_ (“OWNER”) and \_\_\_\_\_ (“CONTRACTOR”).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

**ARTICLE 1 – WORK**

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

Water System Improvements, 1,000,000 Gallon Elevated Tank

**ARTICLE 2 – THE PROJECT**

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Water System Improvements, 1,000,000 Gallon Elevated Tank

**ARTICLE 3 – ENGINEER**

3.01 The Project has been designed by HMB Professional Engineers, Inc. (ENGINEER), who is to act as OWNER’s representative, assume all duties and responsibilities, and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

**ARTICLE 4 – CONTRACT TIMES**

4.01 *Time of the Essence*

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

4.02 *Days to Achieve Substantial Completion and Final Payment*

A. The Work will be substantially completed within See Notice to Proceed days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within See Notice to Proceed days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

- A. CONTRACTOR and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER \$1,000.00 for each day that expires after the time specified in Paragraph 4.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER \$1,000.00 for each day that expires after the time specified in Paragraph 4.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

**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, 5.01.B, and 5.01.C below:

- A. For all Work other than Unit Price Work, a Lump Sum of:

N/A	(\$N/A)
(words)	(figure)

All specific cash allowances are included in the above price and have been computed in accordance with paragraph 11.02 of the General Conditions.

- B. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item as indicated in this paragraph 5.01.B:

As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by ENGINEER as provided in Paragraph 9.07 of the General Conditions. Unit prices have been computed as provided in Paragraph 11.03 of the General Conditions.

UNIT PRICE WORK

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Estimated Quantity</u>	<u>Unit Price</u>	<u>Total Estimated Price</u>
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*See Bid Schedule*

ESTIMATED TOTAL OF ALL UNIT PRICE WORK	\$ <u>See Bid Schedule</u>	\$( <u>          </u> )
	(use words)	(figure)

- C. 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 TBD 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, less such amounts as ENGINEER shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions.

### *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 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 the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.
- E. CONTRACTOR has obtained and carefully studied (or assumes responsibility for 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 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.
- F. 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.
- G. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. CONTRACTOR has 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.
- I. 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.
- J. 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 7, inclusive).
  - 2. Performance bond (pages PB-1 to PB-2, inclusive).
  - 3. Payment bond (pages PB-3 to PB-4, inclusive).
  - 4. Other bonds (pages N/A to N/A, inclusive).
    - a. N/A (pages \_\_\_\_ to \_\_\_\_, inclusive).
    - b. N/A (pages \_\_\_\_ to \_\_\_\_, inclusive).
    - c. N/A (pages \_\_\_\_ to \_\_\_\_, inclusive).
  - 5. General Conditions (pages GC-1 to GC-55, inclusive).

6. Supplementary Conditions (pages SGC-1 to SGC-5, inclusive).
  7. Specifications as listed in the table of contents of the Project Manual.
  8. Drawings consisting of twenty (20) sheets with each sheet bearing the following general title: Water System Improvements Jessamine County Water District No. 1.
  9. Addenda (numbers See Appendix 7 to \_\_\_\_\_, inclusive).
  10. Exhibits to this Agreement (enumerated as follows):
    - a. CONTRACTOR's Bid (pages BS-1 to BS-7, inclusive).
    - b. Documentation submitted by CONTRACTOR prior to Notice of Award (pages N/A to N/A, inclusive).
    - c. N/A.
  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 NP-1 to \_\_\_\_\_, 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.

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:

CONTRACTOR

Jessamine County Water District No.1

\_\_\_\_\_

By: Carl Waits

By: \_\_\_\_\_

Title: Chairman

Title: \_\_\_\_\_

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest: Eddie Cox

Attest: \_\_\_\_\_

Title: Secretary

Title: \_\_\_\_\_

Address for giving notices:

Address for giving notices:

Jessamine County Water District No.1

\_\_\_\_\_

2225 Lexington Road

\_\_\_\_\_

Nicholasville, KY 40356

\_\_\_\_\_

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: Rural Development

By: Julie Anderson

Date: \_\_\_\_\_

Title: State Engineer



# 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):

Jessamine County Water District No.1  
2225 Lexington Road  
Nicholasville, KY 40356

CONTRACT

Date:

Amount:

Description (Name and Location):

Water System Improvements, 1,000,000 Gallon Elevated Tank  
Jessamine County, KY

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL

Company:

Signature: \_\_\_\_\_ (Seal)

Name and Title:

SURETY

\_\_\_\_\_  
(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

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

Attest:

Signature and Title

CONTRACTOR AS PRINCIPAL

Company:

Signature: \_\_\_\_\_ (Seal)

Name and Title:

SURETY

\_\_\_\_\_  
(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title:

EJCDC No. C-610 (2002 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

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

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

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

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

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

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

1. Surety in accordance with the terms of the Contract;
2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.

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

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

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

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

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

1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
2. Deny liability in whole or in part and notify Owner citing reasons therefor.

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

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

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

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

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

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

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

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

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

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

12. Definitions.

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

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

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

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

FOR INFORMATION ONLY – Name, Address and Telephone  
Surety Agency or Broker  
Owner's 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):

Jessamine County Water District No.1  
2225 Lexington Road  
Nicholasville, KY 40356

CONTRACT

Date:

Amount:

Description (Name and Location):

1,000,000 Gallon Elevated Tank  
Water System Improvements  
Jessamine County, KY

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL

Company:.

Signature: \_\_\_\_\_ (Seal)

Name and Title:

SURETY

\_\_\_\_\_  
(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

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

Attest:

Signature and Title

CONTRACTOR AS PRINCIPAL

Company:

Signature: \_\_\_\_\_ (Seal)

Name and Title:

SURETY

\_\_\_\_\_  
(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title:

EJCDC No. C-615 (2002 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, the American Institute of Architects, the American Subcontractors Association, and the Associated Specialty Contractors.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### 15. DEFINITIONS

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

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

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

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

# Notice to Proceed

Dated \_\_\_\_\_

Project: Water System Improvements	Owner: Jessamine County Water District No. 1	Owner's Contract No.:
Contract: Water System Improvements, 1,000,000 Gallon Elevated Tank		Engineer's Project No.: 4099.00/.15

Contractor:

Contractor's Address: [send Certified Mail, Return Receipt Requested]

You are notified that the Contract Times under the above contract will commence to run on \_\_\_\_\_  
\_\_\_\_\_. On or before that date, you are to start performing your obligations under the Contract Documents.  
In accordance with Article 4 of the Agreement, the date of Substantial Completion is \_\_\_\_\_, and the  
date of readiness for final payment is \_\_\_\_\_.

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions provides that you and  
Owner must each deliver to the other (with copies to Engineer and other identified additional insureds) certificates of  
insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also, before you may start any Work at the Site, you must:

Provide fully functional electronic format video of pre-construction conditions within the project area to the OWNER  
and ENGINEER.

\_\_\_\_\_  
\_\_\_\_\_

Jessamine County Water District No. 1

Owner

Given by:

Authorized Signature

Chairman

Title

Date

Copy to Engineer



# GENERAL CONDITIONS

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# 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 adaptation 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 and/or OWNER, it must, if requested by ENGINEER and/or OWNER, be uncovered for ENGINEER's and/or OWNER's observation and replaced at CONTRACTOR's expense.

- B. If ENGINEER or OWNER considers it necessary or advisable that covered Work be observed by ENGINEER or OWNER or inspected or tested by others, CONTRACTOR, at ENGINEER's or OWNER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER and/or OWNER 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 an amount (as determined by OWNER) which shall not be less than three nor more than ten times the costs CONTRACTOR incurs in providing any such gratuities to any such officer or employee.



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, Howard Downing, the duly authorized and acting legal representative of Jessamine County Water District No.1, 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.

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Date: \_\_\_\_\_



## 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 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.

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#### **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 USDA Rural Development pursuant to the Consolidated Farm and Rural Development Act (7 USC Section 1921 et seq.), and USEPA SPAP.

#### **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 RD1927-7. 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 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. Add the following new paragraphs immediately after Paragraph 4.02.B:**

- C *In the preparation of Drawings and Specifications, ENGINEER relied upon the following reports of exploration and tests of subsurface conditions at the Site:*

- 1. *See EJCDC No.C-800 for examples.*

- D. *In the preparation of Drawings and Specifications, ENGINEER relied upon the following drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the Site:*

- 1. *See EJCDC No. C-800 for examples.*

- E. *Copies of reports and drawings itemized in SC-4.02.C and SC-4.02.D that are not included with Bidding Documents may be examined at \_\_\_\_\_ during regular business hours. These reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which the CONTRACTOR may rely as identified and established above are incorporated therein by reference. CONTRACTOR is not entitled to rely upon other information and data utilized by ENGINEER in the preparation of the Drawings and Specifications.*

*{OR}*

**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. Add the following new paragraphs immediately after Paragraph 4.06.A:**

- 1. *In the preparation of Drawings and Specifications, ENGINEER relied upon the following reports of Hazardous Environmental Conditions at the Site:*

- a. *See EJCDC No.C-800 for examples.*

- 2. *In the preparation of Drawings and Specifications, ENGINEER relied upon the following drawings of Hazardous Environmental Conditions which are at or contiguous to the Site:*

- a. *See EJCDC No. C-800 for examples.*

- 3. *Copies of reports and drawings itemized in SC-4.06.A.1 and SC-4.06.A.2 that are not included with Bidding Documents may be examined at \_\_\_\_\_ during regular business hours. These reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which the CONTRACTOR may rely as identified and established above are incorporated therein by reference. CONTRACTOR is not entitled to rely upon other information and data utilized by ENGINEER in the preparation of the Drawings and Specifications.*

*{OR}*

**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.

*{The amounts of coverage for each type of insurance under paragraph 5.04 are recommended amounts that should be used to provide the OWNER adequate protection. These amounts should be reviewed in the context of the specific project and adjusted accordingly.}*

**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 }

*{5. List additional types and amounts of insurance that may be required by OWNER.}*

*{6. The ENGINEER shall be included on policy as additional insured.}*

*{SC-5.06.A. In the case of multiple prime contractors on a single Site (multiple prime contractors for the Project may each need to provide property insurance), it is necessary to define the CONTRACTOR responsible for providing the Property Insurance. If there is only one contractor on the site, do not modify paragraph 5.06.A of the General Conditions.}*

*{SC-5.06.A.1. List by name other persons or entities to be included on policy as additional insureds.}*

**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.

*{When multiple prime contractors are working on a single Site, the following modification should be made.}*

**SC-7.02.A.1. Delete paragraphs 7.02.A.1-3 in their entirety and insert the following:**

1. *The \_\_\_\_\_ CONTRACTOR shall have the authority and be responsible for coordination of the activities among the other prime contractors and subcontractors on the Site to ensure a safe, efficient working environment. This authority covers scheduling delivery of materials, storage of materials, sequencing of construction involving different crafts, resolving interface issues between crafts, scheduling testing, and all other aspects of the Work that do not impact the design or function of the Work.*

**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. *{If anyone other than the ENGINEER is providing the Resident Project Representative, this language must be modified.}*

**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 thirty 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).



## WAGE RATES & OVERTIME

If both State and Federal wage decisions apply to this project, both will be included immediately hereafter. The more stringent of the Federal or State requirements is applicable. The highest of the wage rates shall apply to each individual classification, as per KRS 337-010 sub section 4. Wage rates apply to all onsite workers and mechanics, *including* subcontractors.

**The BIDDER must request any additional wage classification not listed on both the State and Federal wage decision.** Please note that under Department of Labor's regulations, "Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii))." Therefore, it is the BIDDER's responsibility to evaluate the actual and potential wage rates when preparing their Bid. Neither the OWNER nor any of its Agents shall be held accountable for any exclusion of specific wage rates in State or Federal wage decisions. Unlisted classifications must be requested by the CONTRACTOR/BIDDER in accordance with applicable funding and/or regulatory agency procedures.

CONTRACTOR must pay overtime (time-and-a-half) for all work in excess of 40 hours per week, per Federal regulations, if State wage rates are not applicable. If State Wage Rates are also applicable, contractors must pay overtime for all work in excess of 8 hours per day, OR in excess of 10 hours per day provided the employer and employee agree to four 10-hour days in writing, regardless of how many hours are worked per week. Each contractor and subcontractor must pay the fringe benefits specified in the wage decision or cash in lieu of benefits. If fringe benefits go into a pension plan, 401(k) plan, health insurance, life insurance, etc, copies of the plans / policies should be submitted to The Department of Labor (DOL) to ensure it meets DOL requirements.

A copy of the wage decision(s) should be posted at the job site at all times.

\*It should be noted that CONTRACTOR Requests for Payment may not be processed without certified payroll documentation.\*





**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](http://www.labor.ky.gov)

**Larry Roberts**  
Secretary

**Anthony Russell**  
Commissioner

December 29, 2014

Chris Stewart  
HMB Professional Engineers  
3 HMB Circle  
Frankfort KY 40601

Re: Jessamine Co. Water District, Water System Improvements - Elevated Tank

Advertising Date as Shown on Notification: January 1, 2015

Dear Chris Stewart:

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 1-022, dated September 23, 2014 for JESSAMINE 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: 057-H-00121-14-1, Heavy/Highway

Sincerely,

Anthony Russell  
Commissioner



KENTUCKY LABOR CABINET  
PREVAILING WAGE DETERMINATION  
CURRENT REVISION  
LOCALITY NO. 022

**GARRARD, JESSAMINE, MERCER & WASHINGTON COUNTIES**

Determination No. CR 1-022

**Project No. 057-H-00121-14-1**  
**Type: \_\_\_ Bldg \_\_\_x HH**

Date of Determination: September 23, 2014

This schedule of the prevailing rate of wages for Locality No. 022, which includes Garrard, Jessamine, Mercer & Washington 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 1-022.

Apprentices shall be permitted to work as such subject to 803 KAR 1:010. Copies of this regulation 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. Fringe benefit amounts are applicable for all hours worked except when otherwise noted. Welders will receive rate for craft in which welding is incidental.

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.

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.



Anthony Russell, Commissioner  
Department of Workplace Standards  
Kentucky Labor Cabinet

CLASSIFICATIONSRATE AND FRINGE BENEFITS

ASBESTOS/INSULATION WORKERS:		BASE RATE	\$24.92
		FRINGE BENEFITS	12.57

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BOILERMAKERS:		BASE RATE	\$23.95
		FRINGE BENEFITS	12.04

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BRICKLAYERS:		BASE RATE	\$24.32
		FRINGE BENEFITS	11.79

FIREBRICK & REFRACTORY:		BASE RATE	\$26.68
		FRINGE BENEFITS	11.82

**\*Layout & Sawman add \$ .25 to Base Rate for both classifications**

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**CARPENTERS:**

Carpenters:	BUILDING	BASE RATE	\$22.72
		FRINGE BENEFITS	13.01

Piledrivermen:	BUILDING	BASE RATE	\$23.22
		FRINGE BENEFITS	13.01

Carpenters:	HEAVY & HIGHWAY	BASE RATE	\$26.90
		FRINGE BENEFITS	14.50

Divers:	HEAVY & HIGHWAY	BASE RATE	\$40.73
		FRINGE BENEFITS	14.50

Piledrivermen:	HEAVY & HIGHWAY	BASE RATE	\$27.15
		FRINGE BENEFITS	14.50

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CEMENT MASONS:		BASE RATE	\$ 14.00
		FRINGE BENEFITS	.79

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ELECTRICIANS:	BUILDING	BASE RATE	\$29.88
		FRINGE BENEFITS	14.78

**When working from Bosum chairs, trusses, stacks, tanks, scaffolds, catwalks, radio and TV towers, structural steel-open, unprotected, unfloored raw steel, bridges, or similar hazardous locations where workmen are subject to a direct fall (except for work performed using JLG's and bucket trucks up to 75 ft.): 50' to 75' - add 25% above workman's straight time rate; over 75' - add 50% above workman's straight time rate.**

**ELECTRICIANS (CONTINUED):**

LINEMEN	HEAVY & HIGHWAY	BASE RATE	\$32.98
		FRINGE BENEFITS	11.60
EQUIPMENT OPERATOR	HEAVY & HIGHWAY	BASE RATE	\$29.48
		FRINGE BENEFITS	10.90
GROUND MEN	HEAVY & HIGHWAY	BASE RATE	\$19.53
		FRINGE BENEFITS	8.91

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**ELEVATOR CONSTRUCTORS:**

BASE RATE	\$29.00
FRINGE BENEFITS	10.88

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**GLAZIERS:**

BASE RATE	\$10.00
FRINGE BENEFITS	0.00

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**IRONWORKERS:**

BASE RATE	\$26.97
FRINGE BENEFITS	20.01

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**LABORERS/BUILDING:**

**GARRARD, JESSAMINE & MERCER COUNTIES:**

BUILDING GOUP 1:

General laborers, asbestos abatement laborer, toxic waste removal laborer, water boys, tool room checker, carpenter tenders, (civil engineer helpers, rodman, grade checkers, excluding all field work performed by Engineering Firms), concrete pouring and curing, concrete forms stripping and wrecking, hand digging and backfilling of ditches, clearing of right of ways and building sites, wood sheeting and shoring, signalman for concrete bucket and general cleaning, and environmental laborer - nuclear, radiation, toxic and hazardous waste - Level D:

BUILDING	BASE RATE	\$21.01
	FRINGE BENEFITS	11.09

BUILDING GROUP 2:

All air tool operators, air track drills, asphalt rakers, tampers, batchers plant and scale man, chain saw, concrete saw, electric hand grinder, all electric bush and chipping hammers, flagmen, forklift operators, form setter (street or highway), metal form setters, heaters, mesh handlers on walkways, streets and roadways outside building, gunnite laborers, hand spiker, introflax burning rod, joint makers, mason tenders, multi-trade tender, pipe layers, plaster tenders, powderman helpers, power driven Georgia buggies, power posthole diggers, railroad laborers, sandblaster laborers, scow man and deck hand, signal man, sweeper and cleaner machines, vibrator operators, walk behind trenching machines, mortar mixer machines, water pumpmen, and environmental laborers - nuclear, radiation, toxic and hazardous waste - Level C:

BUILDING	BASE RATE	\$21.41
	FRINGE BENEFITS	11.09



**LABORERS/BUILDING: (Continued)**

BUILDING GROUP 3:

Asphalt Paver Screwman, Gunnite nozzleman and gunnite nozzle machine operator, sand blaster nozzleman, concrete or grout pumpman, plaster pumpman:

BUILDING	BASE RATE	\$21.61
	FRINGE BENEFITS	11.09

BUILDING GROUP 4:

Powderman and blaster, and environmental laborer - nuclear, radiation, toxic and hazardous waste - Level B:

BUILDING	BASE RATE	\$21.71
	FRINGE BENEFITS	11.09

BUILDING GROUP 5:

Caisson holes (6 ft. and over) pressure and free air including tools, and environmental laborer-nuclear, radiation, toxic and hazardous waste - Level A:

BUILDING	BASE RATE	\$22.21
	FRINGE BENEFITS	11.09

BUILDING GROUP 6:

Tunnel man and tunnel sand miner, cofferdam (pressure and free air), sand hog or mucker (pressure or free air):

BUILDING	BASE RATE	\$22.51
	FRINGE BENEFITS	11.09

**LABORERS/BUILDING:**

**WASHINGTON COUNTY:**

GROUP 1:

Laborers, general carpenter tenders, cement finisher tenders, placing of concrete, wrecking on buildings by Laborers, hand digging and hand backfilling of ditches where the signatory Employer controls the work assignment, and clearing of right of ways and building site, curing of concrete and application hardener, handling chemically treated lumber, installing of wood sheeting and shoring, signal laborers concrete bucket, cleaning and moving of general purpose materials, general clean-up of all scrap and debris:

BUILDING	BASE RATE	\$19.02
	FRINGE BENEFITS	9.78

GROUP 2:

Mason tender, side rail setter (metal), stackman, fork lift operators, masonry and plastering contractors only, power driven Georgia buggy, chain saw, vibrator operator, mesh handler, power tools (air, diesel, electric & gasoline), wagon drill, pipe layer, wall man treatment of exposed concrete (chip, bush, hammer & rub), concrete saw, gasoline tamper machine, walk behind trenching machine, burner man, joint maker, asphalt raker, mobile sweeper:

BUILDING	BASE RATE	\$19.22
	FRINGE BENEFITS	9.78

GROUP 3:

Air track driller, intorflax burning rod, gunnite nozzle man operator, sewer tunnel laborers (free air), sand hog or mucker (free air), welder:

BUILDING	BASE RATE	\$19.42
	FRINGE BENEFITS	9.78

**LABORERS/BUILDING/ CONTINUED:**

**WASHINGTON COUNTY:**

GROUP 4:

Holeman drilled piers, augured, caissons, sand miner (tunnel free air), caisson workers, powderman, construction specialist:

BUILDING	BASE RATE	\$20.02
	FRINGE BENEFITS	9.78

GROUP 5:

Tunnel man and tunnel miners (pressure & free air) shall receive \$1.50 per hour premium above the General Laborers wage rate. Environment worker, toxic & hazardous waste, asbestos removal and lead abatement shall receive \$1.50 per premium above the General Laborers Group 1 wage rate. Any certification required, whether actual skill is used by the contractor will receive pay under Group 5:

BUILDING	BASE RATE	\$20.52
	FRINGE BENEFITS	9.78

**Building Projects: Employees handling chemically treated materials which are harmful to the skin add an additional \$.25 to base rate. Any employee working on high work putting the employee 50 feet above the ground or a solid floor shall receive an additional \$.50 per hour above the base rate. Any employee working on boilers, kilns, melting tanks, furnaces, or when refractory is done using live fire, drying fires, heatups or any hot work shall receive an additional 25% premium above the base rate.**

**LABORERS/HEAVY HIGHWAY:**

**GARRARD, JESSAMINE & MERCER COUNTIES:**

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, swamper, truck spotters and dumpers, and wrecking of concrete forms, general cleanup:

HEAVY & HIGHWAY	BASE RATE	\$21.80
	FRINGE BENEFITS	12.36

HEAVY HIGHWAY 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	\$22.05
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FRINGE BENEFITS 12.36

**LABORERS/HEAVY HIGHWAY: (Continued)**

**GARRARD, JESSAMINE & MERCER COUNTIES:**

HEAVY HIGHWAY GROUP 3:

Asphalt lutean and rakers, gunnite nozzleman, 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	\$22.10
	FRINGE BENEFITS	12.36

HEAVY HIGHWAY 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 drillers (all types), powderman and blasters, troxler and concrete tester if laborer is utilized:

HEAVY & HIGHWAY	BASE RATE	\$22.70
	FRINGE BENEFITS	12.36

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**LABORERS/HEAVY HIGHWAY:**

**WASHINGTON COUNTY:**

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, swamper, truck spotters and dumpers, and wrecking of concrete forms, general cleanup:

HEAVY & HIGHWAY	BASE RATE	\$22.71
	FRINGE BENEFITS	11.45

HEAVY HIGHWAY 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	\$22.96
	FRINGE BENEFITS	11.45

HEAVY HIGHWAY GROUP 3:

Asphalt lutean and rakers, gunnite nozzleman, 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	\$23.01
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FRINGE BENEFITS 11.45

**LABORERS/HEAVY HIGHWAY CONTINUED:**

**WASHINGTON COUNTY:**

HEAVY HIGHWAY 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 drillers (all types), powderman and blasters, troxler and concrete tester if laborer is utilized:

HEAVY & HIGHWAY	BASE RATE	\$23.61
	FRINGE BENEFITS	11.45

MARBLE, TILE & TERRAZZO:

Workers:	BASE RATE	\$15.50
	FRINGE BENEFITS	2.76

Layoutmen:	BASE RATE	\$15.75
	FRINGE BENEFITS	2.76

Finishers:	BASE RATE	\$15.42
	FRINGE BENEFITS	5.42

Setters:	BASE RATE	\$22.64
	FRINGE BENEFITS	6.10

MILLWRIGHTS:	BASE RATE	\$24.18
	FRINGE BENEFITS	15.67

OPERATING ENGINEERS/BUILDING:

BUILDING CLASS A-1: (NCCCO OR OECP CERTIFIED)

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	\$28.75
	FRINGE BENEFITS	14.15

BUILDING CLASS A:

Articulating Dump, Auto Patrol, Batcher Plant, Bituminous Paver, Cableway, Carrydeck Crane, 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,

**OPERATING ENGINEERS/BUILDING (CONTINUED):**

**BUILDING CLASS A CONTINUED:**

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, Self Contained 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, Subgrader, Tunnel Mining Machines including Moles, Shields, or similar types of Tunnel Mining Equipment:

BUILDING	BASE RATE	\$27.66
	FRINGE BENEFITS	14.15

**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**

**BUILDING 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, Truck Crane Oiler, 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	\$24.68
	FRINGE BENEFITS	14.15

**BUILDING 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, Hydro-Seeder, Power Form handling Equipment, Deckhand Steersman, Hydraulic Post Driver and Drill Helper:

BUILDING	BASE RATE	\$23.85
	FRINGE BENEFITS	14.15

**All Building Operators 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**

**OPERATING ENGINEERS/HEAVY HIGHWAY:**

**HEAVY HIGHWAY CLASS A-1: (NCCCO OR OECF CERTIFIED):**

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 Crain, Tower Cranes (French, German and other types), Truck Crane:

HEAVY & HIGHWAY	BASE RATE	\$29.95
	FRINGE BENEFITS	14.15

**OPERATING ENGINEERS/HEAVY HIGHWAY CONTINUED:**

HEAVY HIGHWAY CLASS A:

A-Frame Winch Truck, Auto Patrol, Backfiller, Batcher 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	\$28.85
	FRINGE BENEFITS	14.15

**Above Heavy Highway Operators on cranes with booms one hundred fifty feet (150') and over including jib shall receive \$.50 above base rate.**

HEAVY HIGHWAY 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.), Dredge Engineer, 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	\$26.24
	FRINGE BENEFITS	14.15

HEAVY HIGHWAY CLASS B2:

Greaser on Grease Facilities servicing Heavy Equipment:

HEAVY & HIGHWAY	BASE RATE	\$26.65
	FRINGE BENEFITS	14.15

HEAVY HIGHWAY 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	\$25.95
	FRINGE BENEFITS	14.15

**All Heavy Highway Operators 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:

Brush, Roller, Paperhanger, Taping & Finishing:

BUILDING	BASE RATE	\$12.35
	FRINGE BENEFITS	2.54

Spray & Sandblast:

BUILDING	BASE RATE	\$13.10
	FRINGE BENEFITS	2.54

**Building Projects: Hazardous work, add \$.50 to base rate to include boatswain chairs, safety belt work, skeleton framing steel on all construction work, or work in enclosed buildings over 35 feet in height above permanent working floor area: steam cleaning and sand blasting work, exterior high line pipe (not painted from ground, ladder or scaffolding); exterior stage work, window jack work. Special coatings, add \$.25 to base rate to include ketones, lacquers, catalyzed epoxy, chlorinated rubber & urethane.**

Brush and Roller:

HEAVY & HIGHWAY	BASE RATE	\$18.20
	FRINGE BENEFITS	5.08

Drywall finishers and Plasterers:

HEAVY & HIGHWAY	BASE RATE	\$18.45
	FRINGE BENEFITS	5.08

Spray, sandblast, power tools, waterblast and steam cleaning, brush and roller of mastics, creosotes, kwinch koate and coal tar epoxy:

HEAVY & HIGHWAY	BASE RATE	\$19.20
	FRINGE BENEFITS	5.08

Spray of mastics, creosotes, kwinch koate and coal tar epoxy:

HEAVY & HIGHWAY	BASE RATE	\$20.20
	FRINGE BENEFITS	5.08

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PLASTERERS:

	BASE RATE	\$17.14
	FRINGE BENEFITS	1.65

**For nozzle operator, add \$.50 to base rate except texturing machine with gravity-fed nozzle, and for employees working on swinging scaffold up to 50 ft. Add \$1.00 to base rate for employees working on swinging scaffold over 50 ft. Subtract \$1.00 from base rate for employees finishing drywall or outsulation work.**

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JESSAMINE COUNTY:

PLUMBERS/PIPEFITTERS:

	BASE RATE	\$30.00
	FRINGE BENEFITS	15.56

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GARRARD, MERCER & WASHINGTON COUNTIES:

PLUMBERS/PIPEFITTERS:

	BASE RATE	\$32.00
	FRINGE BENEFITS	15.56

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 ROOFERS: BASE RATE \$11.52  
FRINGE BENEFITS .19  
 -----

SHEETMETAL WORKERS: (includes sheet metal roofs) BASE RATE \$27.45  
FRINGE BENEFITS 11.09  
 -----

SPRINKLER FITTERS: BASE RATE \$29.55  
FRINGE BENEFITS 17.22  
 -----

TRUCK DRIVERS/BUILDING:

Truck Helper and Warehouseman: BUILDING BASE RATE \$15.30  
FRINGE BENEFITS 5.93

Driver - 3 tons and under, Greaser, Tire Changer and Mechanic Helper:  
 BUILDING BASE RATE \$15.42  
FRINGE BENEFITS 5.93

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 \$15.53  
FRINGE BENEFITS 5.93

Drivers, Concrete Mixer Trucks (all types, hauling on job sites only); Truck Mechanics:  
 BUILDING BASE RATE \$15.60  
FRINGE BENEFITS 5.93

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 \$15.70  
FRINGE BENEFITS 5.93

**Building Projects: Truck Drivers who perform work on or hauling to or from any hazardous or toxic waste site, add \$4.00 to base rate of pay.**

**Building Projects: Truck Driver 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.**

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TRUCK DRIVERS/HEAVY HIGHWAY:

Truckhelper and warehouseman:  
 HEAVY & HIGHWAY BASE RATE \$15.65  
FRINGE BENEFITS 5.55

Driver, winch truck and A-Frame when used in transporting materials:  
 HEAVY & HIGHWAY BASE RATE \$15.75



CLASSIFICATIONSRATE AND FRINGE BENEFITS

		FRINGE BENEFITS	5.55
<b>TRUCK DRIVERS/HEAVY HIGHWAY (CONTINUED)</b>			
Driver, (semi-trailer or pole trailer), driver (dump truck, tandem axle), driver of distributor:			
	HEAVY & HIGHWAY	BASE RATE	\$15.85
		FRINGE BENEFITS	5.55
Driver on mixer trucks (all types):			
	HEAVY & HIGHWAY	BASE RATE	\$15.90
		FRINGE BENEFITS	5.55
Truck mechanic:	HEAVY & HIGHWAY	BASE RATE	\$15.95
		FRINGE BENEFITS	5.55
Driver (3 tons and under), tire changer and truck mechanic helper:			
	HEAVY & HIGHWAY	BASE RATE	\$15.98
		FRINGE BENEFITS	5.55
Driver on pavement breakers:			
	HEAVY & HIGHWAY	BASE RATE	\$16.00
		FRINGE BENEFITS	5.55
Driver (over 3 tons), driver (truck mounted rotary drill):			
	HEAVY & HIGHWAY	BASE RATE	\$16.19
		FRINGE BENEFITS	5.55
Driver, Euclid and other heavy earth moving equipment and Low Boy:			
	HEAVY & HIGHWAY	BASE RATE	\$16.76
		FRINGE BENEFITS	5.55
Greaser on greasing facilities:			
	HEAVY & HIGHWAY	BASE RATE	\$16.85
		FRINGE BENEFITS	5.55

**END of DOCUMENT**  
**CR 1-022**  
**September 23, 2014**



**UNITED STATES DEPARTMENT OF AGRICULTURE  
RURAL DEVELOPMENT AND  
FARM SERVICE AGENCY  
CONTRACT CHANGE ORDER**

<b>CONTRACT FOR</b> Water System Improvements - 1,000,000 Gallon Elevated Tank	<b>ORDER No.</b>
	<b>DATE</b>
	<b>STATE</b> KY
<b>OWNER</b> Jessamine County Water District No.1	<b>COUNTY</b> Jessamine

To \_\_\_\_\_  
(Contractor)

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

Description of Changes (Supplemental Plans and Specifications Attached)	DECREASE in Contract Price	INCREASE in Contract Price
	\$ _____	\$ _____
<b>TOTALS</b>	\$ <u>0</u>	\$ <u>0</u>
<b>NET CHANGE IN CONTRACT PRICE</b>	\$ _____	\$ _____

JUSTIFICATION:

The amount of the Contract will be (Decreased) (Increased) By The Sum Of: \_\_\_\_\_ Dollars (\$ \_\_\_\_\_).

The Contract Total Including this and previous Change Orders Will Be: \_\_\_\_\_ Dollars (\$ \_\_\_\_\_).

The Contract Period Provided for Completion Will be (Increased) (Decreased) (Unchanged): \_\_\_\_\_ Days.

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

Requested _____ <span style="float: right;">(Owner)</span>	_____ <span style="float: right;">(Date)</span>
Recommended _____ <span style="float: right;">(Owner's Architect/Engineer)</span>	_____ <span style="float: right;">(Date)</span>
Accepted _____ <span style="float: right;">(Contractor)</span>	_____ <span style="float: right;">(Date)</span>
Approved by Agency _____ <span style="float: right;">(Name and Title)</span>	_____ <span style="float: right;">(Date)</span>

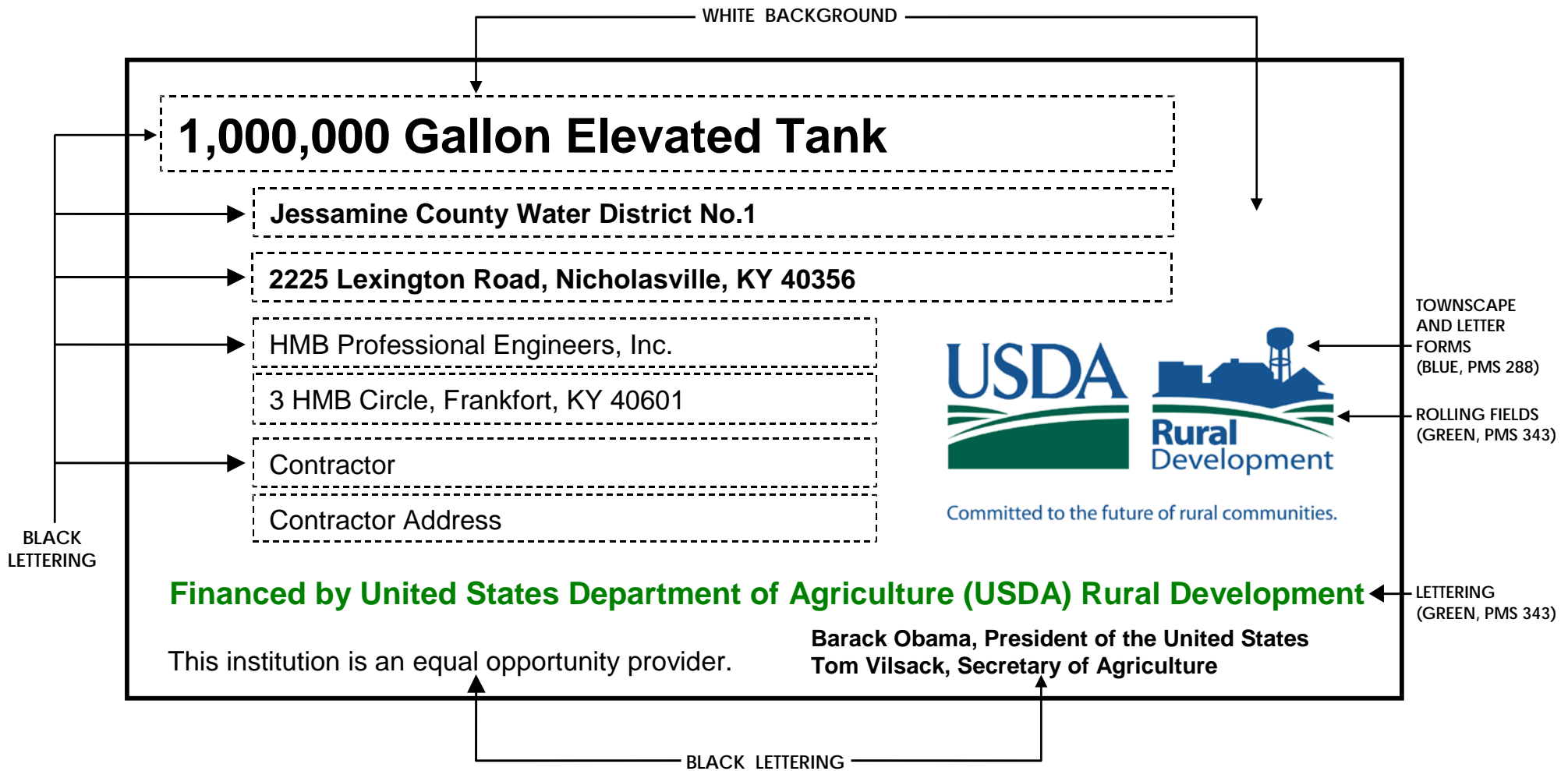
Public reporting burden for this collection of information is estimated to average 15 minutes per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to U. S. Department of Agriculture, Clearance Officer, STOP 7602, 1400 Independence Avenue, S.W., Washington, D.C. 20250-7602. Please DO NOT RETURN this form to this address. Forward to the local USDA office only. You are not required to respond to this collection of information unless it displays a currently valid OMB control number.



<b>PARTIAL PAYMENT ESTIMATE</b>				<b>HMB Project No. 4099.15</b>	
OWNER: Jessamine County Water District No.1 2225 Lexington Road Nicholasville, KY 40356				CONTRACT No. 1,000,000 Gallon Elevated Tank	
				PARTIAL PAYMENT ESTIMATE No.	
CONTRACTOR:				PAGE	OF
				PERIOD OF ESTIMATE	
				From	To
<b>CHANGE ORDER SUMMARY</b>				<b>ESTIMATE</b>	
No.	AGENCY APPROVAL DATE	AMOUNT		1. ORIGINAL CONTRACT	
		ADDITIONS	DEDUCTIONS	2. CHANGE ORDERS	
				3. REVISED CONTRACT (1+2)	
				4. WORK COMPLETED	
				5. STORED MATERIALS	
				6. SUBTOTAL (4+5)	
				7. RETAINAGE	
TOTALS		\$0.00	\$0.00	8. PREVIOUS PAYMENTS	
NET CHANGE		\$0.00		9. AMOUNT DUE (6-7-8)	
<b>CONTRACT TIME</b>					
ORIGINAL DAYS			270	START DATE	
REVISED				PROJECTED COMPLETION	
REMAINING			270	COMPLETION DATE	
<b>CONTRACTOR CERTIFICATION:</b> The undersigned Contractor certifies that to the best of their knowledge, information and belief the work covered by this payment estimate has been completed in accordance with the contract documents. That all amounts have been paid by the contractor for work for which previous payment estimates was issued and payments received from the owner, and that the current payment shown is now due.				<b>ENGINEER CERTIFICATION:</b> The undersigned certifies that the work has been carefully inspected and to the best of their knowledge and belief, the quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents.	
CONTRACTOR				ENGINEER	
BY DATE				HMB Professional Engineers, Inc.	
BY DATE				RO	
BY DATE				PM - Chris A Stewart, PE	
BY DATE				BY DATE	
BY DATE				BY DATE	
<b>APPROVED BY OWNER:</b>				<b>ACCEPTED BY RURAL DEVELOPMENT:</b>	
OWNER Jessamine Co. Water District No. 1				This review and acceptance of this estimate by RURAL DEVELOPMENT does not attest to the correctness of the quantities shown or that the work has been performed in accordance with the contract documents.	
BY Carl Waits, Chairman				BY DATE	
BY DATE				BY DATE	
BY DATE				BY DATE	



# TEMPORARY CONSTRUCTION SIGN FOR RURAL DEVELOPMENT PROJECTS



**SIGN DIMENSIONS:** 1200 mm x 2400 mm x 19 mm (approx. 4' x 8' x 3/4")  
PLYWOOD PANEL (APA RATED A-B GRADE-EXTERIOR)





## SPECIAL CONDITIONS

### 1. PROJECT FUNDING

CONTRACTORS bidding the project should be aware that funding is provided by local funds, USDA Rural Development (RD) and Kentucky Infrastructure Authority (KIA).

All Requests for Payment must be approved by the OWNER, ENGINEER and RD prior to payments being made. The OWNER will process payments to the CONTRACTOR as quickly as possible after payments from the funding agencies are made to the OWNER.

In order to try to minimize delays in funding availability, it is anticipated that quantities shall be cut off at the 20<sup>th</sup> of each month. The CONTRACTOR shall be responsible for preparing partial payment estimates, reviewing estimates/quantities with the Resident Project Observer (RPO), obtaining the RPO's signature on the estimate and forwarding all documents (signed by the CONTRACTOR and RPO) to the ENGINEER as soon as possible after the 20<sup>th</sup>, but in no circumstances later than the 25th of the month. The OWNER and ENGINEER will in no way be held responsible for delays in payments to the CONTRACTOR if this schedule is not met.

Monthly project progress meetings will be held at the OWNER's business office, or other location designated by the OWNER. It is anticipated that monthly meetings will be held at the same day and time each month, likely on the first Thursday of each month in the morning. These meetings will be scheduled after Award of all Contracts and at the most mutually beneficial day and time for all parties.

Once all partial pay requests are reviewed and approved by all parties at the monthly progress meetings, all fully executed documents will be forwarded to KIA for processing and payment as appropriate.

Changes to this procedure will be discussed with the selected CONTRACTOR in advance and agreed upon at the Pre-Construction Conference.

### 2. PROJECT CONSTRUCTION OBSERVATION

Construction observation services shall be provided by the ENGINEER. The Observer shall be on the project as much as possible; however, due to meetings, etc. there may be times when he is not with the crew. Therefore, the CONTRACTOR shall not backfill any main lines and/or appurtenances, structures or other installed infrastructure until the Observer has seen and accepted the work for payment.

Any work backfilled or otherwise obscured or completed without the Observer's knowledge and consent shall not be allowed for payment to the CONTRACTOR and shall be uncovered for inspection at no additional cost to the OWNER or ENGINEER.

The ENGINEER's representative for tank construction and coatings will be:

Mr. Mike Topp  
Horizon Inspection Services  
(502)727-2828  
[horizoninspection@yahoo.com](mailto:horizoninspection@yahoo.com)

3. UNCLASSIFIED EXCAVATION

All excavation is unclassified. No extra payment will be allowed for rock excavation of any kind. It is the CONTRACTOR's responsibility to make any additional investigations to determine depth, location or competency of rock within the project area.

4. CONFLICTING SECTIONS/STATEMENTS IN CONTRACT DOCUMENTS

a. General

It shall be noted that if any provisions in these Contract Documents is in conflict and/or is inconsistent with any other section or provisions, then the most stringent shall apply per the interpretation of the ENGINEER and/or OWNER.

b. Hold Period on Bids

All bids shall remain valid for a period of 90 days. Any reference to a lesser period of time is incorrect.

5. CONTRACTOR'S INSURANCE CERTIFICATE

The following wording for the cancellation clause on the insurance certificate is required:

"Should any of the above described policies be canceled before the expiration date thereof, the issuing company will mail 15 days written notice to the certificate holder named to the left."

6. FEDERAL/STATE/LOCAL REGULATIONS

The CONTRACTOR shall abide by all local and state laws or ordinances to the extent that such requirements do not conflict with federal laws or regulations. Compliance with any and all applicable laws and/or regulations is strictly the CONTRACTOR's responsibility.

7. SILTATION AND SOIL EROSION

The CONTRACTOR shall make every effort during construction to minimize siltation and soil erosion and comply with all local and state codes that pertain to this project. Any applicable permits shall be the CONTRACTOR's responsibility to obtain, at no additional cost to the OWNER.

8. PRIORITY OF CONSTRUCTION

It is the OWNER's desire to place the new tank into service before the end of 2015.

9. ROUGH CLEAN UP

- a. Rough clean up shall be performed on a daily basis concurring with the daily rate of production for pay items, amounts and/or quantities listed in the schedule of values and/or Bid Schedule.
- b. The CONTRACTOR is to provide sufficient labor and equipment for clean up as to not impede production schedules.
- c. Rough clean up shall be defined as follows:
  1. All open ditches shall be backfilled on a daily basis.
  2. Debris (rocks, roots, timber, etc.) shall be removed from the job site on a daily basis. This material may be stockpiled with the consent of the OWNER and the ENGINEER in designated locations. Any such locations shall be arranged by the CONTRACTOR with the written consent of the property owner.
  3. Remaining backfill material (soil) shall be windrowed back on top of the ditch line, compacted and leveled giving consideration for settlement.

- d. At the direction of the ENGINEER, OWNER, or their appointed representatives, the CONTRACTOR shall readdress areas if identified as not being adequate in the initial rough clean-up process.

10. QUANTITIES OF MATERIALS

The quantities of materials listed on the Bid Schedule are estimates only and are subject to changes in the field. The CONTRACTOR shall verify these quantities before ordering materials. In the event of an under run or over run of materials, the CONTRACTOR shall be responsible for any shipping and/or restocking fees.

11. SHOP DRAWING REVIEW

Throughout these Specifications, all reference to Shop Drawing review by the ENGINEER, should read fourteen (14) days, not 30 days or any other number of days more or less than 14.

12. CONSTRUCTION PERIOD – ADVERSE WEATHER DAYS

The CONTRACTOR is to note that there are adverse weather days included within the allotted construction time. The number of days per month already included in the Construction Period is listed below. Adverse weather conditions should be expected to be equal to or less than those listed below per month, as these would be considered normal conditions and not subject to additional time for construction due to adverse weather. Any documented adverse weather conditions beyond the amount listed below may be considered, at the request of the CONTRACTOR, for additional construction time. Adverse weather for the purposes of this Contract shall be defined as days in which precipitation exceeds 0.1" and/or the average temperature is below 32 degrees F during normal working (daylight) hours. Days not meeting these criteria during daylight hours shall not be considered as adverse weather days.

If the CONTRACTOR's normal operations for the project do not include weekend and holiday work, then those days may not be counted as adverse weather days, regardless of actual recorded weather conditions. Adverse weather conditions on weekends and holidays may be considered by the OWNER for a contract time adjustment provided that the CONTRACTOR has provided a minimum of four (4) working days' notice to the RO, ENGINEER and OWNER of his intention to work on a weekend and/or holiday.

Any day that the CONTRACTOR mobilizes forces to the project site and the RO is required by his normal duties to be on site for two (2) hours or longer shall not be considered for a claim of adverse weather. Any day that the CONTRACTOR chooses not to work due to weather or site conditions, but fails to notify the RO in a timely manner,

shall not be considered for a claim of adverse weather.

The CONTRACTOR is required to report any days missed due to adverse weather conditions in the previous month at the monthly Progress Meetings. No days other than those reported by the CONTRACTOR at monthly Progress Meetings shall be considered for adverse weather time extensions.

The contract documents establish the documentation requirements for adverse weather days claims by the CONTRACTOR. Any claims not in accordance with those requirements shall not be considered.

The CONTRACTOR and the RPO shall both record weather conditions at the project site on a daily basis and shall reconcile their notes and records at least weekly.

The normal adverse weather days are calculated using data from the National Oceanic and Atmospheric Administration and are as follows:

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
15	12	9	8	8	7	8	7	6	5	7	11

Days in which the CONTRACTOR does not attempt to work, and which are not satisfactorily documented as an adverse weather day, will not be considered in any request for construction time extension by the CONTRACTOR.

13. ROADWAY/DRIVEWAY CROSSINGS

All roadways or driveways crossed by installed lines shall be bored if the surface is not gravel. All State or County maintained roads shall have steel casing pipe installed by bore, unless otherwise shown on the plans. All private driveways with non-gravel surfaces shall be free bored without casing pipe, if possible.

The CONTRACTOR shall attempt to bore all non-gravel private driveways without casing pipe. If it is not possible to bore the driveway without casing pipe, the CONTRACTOR may then utilize steel casing pipe for the driveway bore. If the CONTRACTOR does not first attempt to bore without casing pipe, the CONTRACTOR shall be paid for a driveway bore without casing pipe, regardless of whether casing pipe was installed, or not.

Asphalt or concrete driveways shall be bored in all instances, unless prior approval is given, in writing, by the property owner and the OWNER.

County Roads may not be open cut nor the paving disturbed in any way without prior written approval from the Fiscal Court.

Under no circumstances shall any State roads be disturbed, crossed or cut without prior written approval from the Kentucky Transportation Cabinet.

Any gravel driveway or roadway crossed shall be backfilled entirely with crushed stone and compacted accordingly to prevent future settlement. The CONTRACTOR will be responsible for making any requested repairs to any driveway or roadway crossed on the Project throughout the one-year warranty period, to the satisfaction of the property owner and the OWNER.

14. ITEMS DELETED, REDUCED AND/OR INCREASED

The OWNER reserves the right to delete any bid item or, in the case of unit price items, delete, reduce or increase the quantities involved. Bidders shall be aware of this possibility and shall base their bids accordingly. Please also refer to item 10 above.

15. SPECIAL PROVISIONS - CLEANUP

The CONTRACTOR shall take particular notice of sections of the Contract Documents pertaining to project cleanup. It is the OWNER's intent to strictly enforce these items.

16. PROPERTY OWNER RELEASE

The OWNER reserves the right to require the CONTRACTOR to obtain a written, signed Release from any or all property owners impacted by the Work prior to final payment to the CONTRACTOR. The Release form is included in the Appendices and may be required from all property owners impacted by the project, regardless of whether work was performed on right-of-way or on easements.

17. VIDEOTAPING

The CONTRACTOR shall not mobilize any equipment to the site prior to presenting the ENGINEER and OWNER with fully functional DVD copies of the project area conditions prior to construction activities, per the technical specifications. Failure of the CONTRACTOR to provide a satisfactory video shall not prevent the construction time from starting and shall not be cause for a time extension to the CONTRACTOR.

Any construction work prior to receipt and verification of the functionality of the video by the OWNER and/or ENGINEER shall not be eligible for payment to the CONTRACTOR.

Any work added to the Project via Change Order, or other means, shall also be videotaped per the specifications prior to mobilization by the CONTRACTOR to that area. Fully functional DVD copies of the pre-construction video of added areas shall be provided to the ENGINEER and OWNER prior to mobilization.

18. BUILDER'S RISK INSURANCE

The CONTRACTOR shall secure "All Risk" type Builder's Risk Insurance for Work to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the Contract Price totaled in the awarded Bid. The policy shall cover not less than the losses due to fire, flood, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft and smoke during the Contract Time, and until the Work is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER and the OWNER. If the Builder's Risk Insurance secured by the CONTRACTOR excludes coverage for flood damage, the CONTRACTOR shall secure the maximum amount of Federal Flood Insurance available for the Contract.

Builder's Risk Insurance shall include coverage of any stored materials for which the CONTRACTOR intends to request payment. Documentation of Builder's Risk Insurance shall be provided by the CONTRACTOR along with the Certificate of Insurance required prior to Award.

19. MBE/WBE REQUIREMENTS AS IT PERTAINS TO ALL FUNDING AGENCIES

The CONTRACTOR shall note that the OWNER intends to expedite the Award of this Contract after the lowest responsive and responsible Bidder is determined. Therefore, any and all paperwork that may be required, of the CONTRACTOR and/or any Subcontractors on the Project, with regard to MBE/WBE, or similar, requirements shall be expedited and commenced immediately upon being notified that they are the lowest responsible Bidder.

20. APPROVED EQUAL CLAUSE

- a. Any reference to a specific equipment brand name within the Specifications or Drawings shall be deemed to include "or approved equal", unless otherwise noted.
- b. Delete any statement such as "No other manufacturers are acceptable" within the Specifications.

21. DISPOSAL OF TRENCH WATER

The CONTRACTOR shall not dispose of any trench water by allowing it to enter any sanitary sewer system without first obtaining written permission to do so from the owner of said system. Documentation of written permission must be provided to the ENGINEER and OWNER.

22. ELECTRICAL SERVICE(S)

The CONTRACTOR is responsible for providing all electrical service for the Project, either temporary or permanent. The CONTRACTOR shall coordinate obtaining all electrical services and required permits, and pay all fees to applicable service providers or other agencies. Any cost of providing electrical service access to an unserved area and/or upgrade of service required for the project is the CONTRACTOR's responsibility and is to be included in the Bid. Contact information for local service providers may be obtained from the OWNER upon request.

23. PERMIT COMPLIANCE

Compliance with any and all permits related to the Project is strictly the responsibility of the CONTRACTOR. This includes, but is not limited to, Transportation Cabinet Encroachment Permits, Railroad Permits, Division of Water Permits and/or NPDES Permits that may apply to the Work.

Copies of Permits previously obtained for the Project are included in applicable Appendices of the Contract Documents and/or are available from the OWNER and/or ENGINEER for review upon request.

The ENGINEER and/or OWNER have acquired all Permits that were known to be required and reasonably available. Any other Permits that may be required for any reason are the responsibility of the CONTRACTOR to obtain at no additional cost to the OWNER.

It is the CONTRACTOR's responsibility to comply with any and all aspects of the Manual on Uniform Traffic Control Devices (MUTCD) when working in or around any existing roadway, in accordance with the applicable Permits, including but not limited to adequate signage and/or flagging.

Note that the CONTRACTOR is responsible for preparation and submittal of the Stormwater NOI and NOT found in Appendix 1 to the State Division of Water and to Jessamine County Planning and Zoning.



The CONTRACTOR is also responsible for preparation and submittal of an Erosion Control Plan to Jessamine County Planning and Zoning.

Jessamine County Planning and Zoning may be reached at:

Jessamine County Planning and Zoning  
121 South Main Street  
Nicholasville, KY 40356  
859-885-6415  
859-885-9681 Fax  
Chris Woodall, Director – [cwoodall@jessamineco.com](mailto:cwoodall@jessamineco.com)

24. PREVAILING WAGE RATES

Prevailing wage rates may apply to this Project and are included in the Contract Documents, if so. It is strictly the CONTRACTOR's responsibility to comply with Wage Rates requirements and to provide written documentation of compliance to the ENGINEER with each and every Pay Request. The ENGINEER and OWNER will not process any Pay Request without compliant certified payroll documentation from the CONTRACTOR.

25. POST CONSTRUCTION VIDEO INSPECTION

The CONTRACTOR shall provide the OWNER and ENGINEER a digital copy of a CCTV Inspection of the interior of any and all gravity sewer lines (sanitary or storm) installed in this Project. The CONTRACTOR shall repair any defects found prior to the final acceptance of the Work by the OWNER. Cost of post construction CCTV inspection and report shall be included in the CONTRACTOR's Bid. No additional compensation shall be awarded the CONTRACTOR for post construction inspection or any related repairs/corrections/mitigation measures required.

26. GENERAL

a. Reasonable care shall be taken by the CONTRACTOR during construction to avoid damage to existing vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees that receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing. Property owners shall be notified by the CONTRACTOR prior to any alteration to existing trees and/or landscaping on their property.

- b. CONTRACTOR shall implement Best Management Practices as described in the Kentucky Best Management Practices for Construction Activities prepared by Division of Conservation and Division of Water, Natural Resources and Environmental Protection Cabinet.

27. RECORD DRAWINGS

The CONTRACTOR shall maintain a set of plans with current mark ups showing any changes made in the field to the location, orientation, etc. of any element of the project during construction. This set of plans shall be provided to the ENGINEER at the conclusion of the project and shall be used by the ENGINEER in developing the most accurate set of construction Record Drawings possible for the OWNER. Upon request by the CONTRACTOR, the set of plans shall be returned.

28. CASING PIPE SURVEY REQUIREMENTS

The CONTRACTOR shall provide a licensed land surveyor in the State of Kentucky to determine the horizontal and vertical location of all casing pipes under State and Federal highways on projects involving Kentucky Transportation Cabinet Utility Relocations. This information shall be provided to the ENGINEER along with the CONTRACTOR's field mark ups of the drawings to assist in the development of accurate Record Drawings.

29. CONTRACTOR SURVEY REQUIREMENTS

At the conclusion of a project involving storm or sanitary sewers, the CONTRACTOR shall provide the ENGINEER with electronic survey data from a licensed Professional Land Surveyor in the State of Kentucky. The provided data shall include horizontal and elevation data for the rim, invert and any other penetrations of all structures involved in the project. The data shall be in a format and coordinate system stipulated by the ENGINEER and shall be provided to the ENGINEER prior to final payment to the CONTRACTOR.

30. PIPELINE TESTING

CONTRACTOR shall pressure test sections of water line or force main no greater than 3,500 feet in length. Gravity sewers shall be tested in sections between manholes.

Water main shall be tested in accordance with the pressures listed in the table below and the contents of the technical specifications.

<u>Pipe Classification</u>	<u>Test Pressure</u>
PVC SDR-21, Cl. 200	185 psi
PVC SDR-17, Cl. 250	215 psi
PVC C-900 DR14, Cl. 200	250 psi
Ductile Iron, Cl. 350	350 psi

31. RETAINAGE

Retainage shall be withheld in the amount of the 10% of the total amount of completed work to date, plus stored materials, on each Pay Request up until Substantial Completion. Upon Substantial Completion, the CONTRACTOR may request a reduction in Retainage to 5%. If work is satisfactory to date, the OWNER may consider the request. However, it is understood that the OWNER is under no obligation to grant such request. If granted, no further reduction of retainage shall be considered prior to the final payment to the CONTRACTOR. Further, the OWNER reserves the right to restore retainage to the full 10% at any time if the CONTRACTOR's work ceases to be satisfactory to the OWNER.

32. TANK SITE ADJACENT PROPERTY OWNER INFO

The CONTRACTOR may need to contact the property owner of the parent tract surrounding the tank site. The OWNER purchased the tank site on November 15, 2010 from Man-O-War Park Partners, Ltd. The contact information for Man-O-War Park Partners, Ltd at that time is:

Mr. Ray Duran, Jr. – CFO/Treasurer  
Hays Automotive Group  
6015 Preston Highway  
Louisville, KY 40219-1393  
(502)815-2757

Mr. William E Hays, Jr. - President  
Man-O-War Park Partners, Ltd  
6015 Preston Highway  
Louisville, KY 40219-1393

Pastor Mark Horton  
Faith United Church  
3080 Brannon Road  
Nicholasville, KY 40356  
(859)272-5339

33. VALVE COLLARS

All valve collars shall be formed in the field and poured in place. Prefabricated collars shall not be accepted.



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**SECTION 01010**  
**Summary of Work**

**PART 1 GENERAL**

**1.1 DESCRIPTION**

A. The Work to be performed by the CONTRACTOR under this Contract shall consist of furnishing all labor, materials, tools, equipment and incidentals and performing all Work required to construct complete in place and ready to operate:

1. One (1) 1.0 Million Gallon Elevated Water Storage Tank and Coatings, Valve Vault, Appurtenances and Site Work
2. One (1) 600 GPM Pump Station, Appurtenances and Site Work
3. 1,600 +/- LF of 12" Water Main and Appurtenances
4. SCADA System
5. Control Valve and Vault
6. Backflow Preventer and Vault
7. Videotaping
8. Cleanup
9. Other items shown on the plans or described in the contract documents

B. All Work described above shall be performed as shown on the Drawings and as specified.

**1.2 PROJECT LOCATION**

The equipment and materials to be furnished will be installed at the locations shown on the Drawings.

**1.3 QUANTITIES**

The OWNER reserves the right to alter the quantities of work to be performed or to extend or shorten the improvements at any time when and as found necessary, and the CONTRACTOR shall perform the work as altered, increased or decreased. Payment for such increased or decreased quantity will be made in accordance with the Instructions to Bidders. No allowance will be made for any change in anticipated profits nor shall such changes be considered as waiving or invalidating any conditions or provisions of the Contract and Bond.

END OF SECTION



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## **SECTION 01016**

### **Occupancy**

#### **PART 1 GENERAL**

##### **1.1 PARTIAL OCCUPANCY BY OWNER**

Whenever, in the opinion of the ENGINEER or desire of the OWNER, any section or portion of the Work or any structure is in suitable condition, it may be put into use upon the written order of the ENGINEER and such usage will not be held in any way as an acceptance of said Work or structure, or any part thereof, or as a waiver of any of the provisions of these Specifications and the Contract. It shall also be understood that such occupancy is not Substantial Completion, nor does the required Warranty period begin upon such occupancy. Pending final completion and acceptance of the Work, all necessary repairs and replacements, due to defective materials or workmanship or operations of the CONTRACTOR, for any section of the Work so put into use shall be performed by the CONTRACTOR at CONTRACTOR'S own expense.

END OF SECTION





**PART 1 GENERAL**

**1.1 DESCRIPTION OF WORK**

This Section covers the provision for the CONTRACTOR to provide all labor, materials, equipment, services and perform all operations necessary to furnish to the OWNER and ENGINEER a complete, color audio-video record of the surface features within the proposed construction's zone of influence. This record shall include, but not be limited to, all audio-video tape storage cases, tape logs and indexes. The purpose of this coverage shall be to accurately document the pre-construction condition of these features within the project area.

**PART 2 MATERIALS**

**2.1 GENERAL**

The total audio-video recording system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project, as well as those more subjective requirements of high quality audio and video production. The video portion of the recording shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, or any other form of picture imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume, clarity and be free from distortion. Recording speed shall be compatible for playback in SP mode.

The recording system shall utilize EIA standard video and NTSC compatible color (American TV Standard), and shall utilize digital technology.

**2.2 VIDEO MEDIA**

The video furnished to the OWNER and ENGINEER shall be electronic, color, DVD. The video shall be new and thus shall not have been used for any previous recording. The CONTRACTOR shall provide the ENGINEER and OWNER a copy of the DVD.

**2.3 VIDEO PLAYBACK COMPATIBILITY**

The recorded video shall be compatible for playback with any American TV Standard DVD player, and standard personal computer.

**PART 3 EXECUTION****3.1 VIDEO CONTENT****A. General**

The recording shall contain coverage of all surface features located within the construction's zone of influence. The construction's zone of influence shall be defined (1) as the area within the permanent and temporary easements, and areas adjacent to these easements which may be affected by routine construction operations; and (2) by the direction of the ENGINEER and/or OWNER. The surface features within the construction's zone of influence shall include, but not be limited to, all roadways, pavements, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery and fences. Of particular concern shall be the existence or non-existence of any faults, fractures or defects prior to construction.

**B. Streets**

Where construction will extend in or adjacent to a street, the full width of the construction's zone of influence including the street right-of-way shall be recorded, unless otherwise authorized by the ENGINEER. The term street shall be understood to mean a highway, road, street, avenue, boulevard, lane, circle, alley, etc.

**C. Easements**

Where construction will extend through easement areas, the permanent and temporary easements and all other adjacent areas lying within the construction's zone of influence shall be recorded. The term easement shall be understood to mean all areas not defined as streets.

**3.2 ALPHA-NUMERIC DISPLAYS**

All video recordings must, by electronic means, display continuously and simultaneously generated, transparent, alpha-numeric information to include the following:

**A. Video Index, Number, Project Title and General Project Location**

Each video shall begin with a single, multi-line, alpha-numeric display indicating the video tape index number, project title and general location of the project.

B. Time and Date

During the entire duration of the recordings, the time (in hours, minutes and seconds separated by colons) and date (consisting of month, day and year separated by slashes) of recording must appear in the upper left-hand corner of the picture.

C. Name and Side of Street or Easement

During the entire duration of the recordings, the name and side of the street or easement being recorded must appear across the bottom of the picture.

D. Camera Position

During the entire duration of the recordings, the position of the camera, accurately referenced and displayed in terms of the construction's engineering stationing, shall be displayed (in standard stationing format) in the lower left-hand corner of the picture. Where no stationing appears on the engineering plans, an appropriate stationing system, acceptable to the ENGINEER and OWNER, shall be established and utilized.

### 3.3 AUDIO CONTENT

Accompanying the video recording of each video tape shall be corresponding and simultaneously recorded audio. This audio recording, exclusively containing the commentary of the camera operator, shall assist in the maintenance of viewer orientation and in any needed identification, differentiation, clarification or objective description of the structures being shown in the video portion of the recording. The audio recording also shall be free from any conversations between the camera operator and the other production technicians.

### 3.4 VIDEO INDEXING

A. Video Identification

All videos and their vinyl storage cases shall be properly identified by video index number, project title, and general project location.

B. Video Logs

Displayed on the storage case of each video shall be a log of that video's contents. That log shall describe the various segments of coverage contained on that video in terms of the names and sides of the streets or easements, coverage beginning and endpoints, directions of coverage and video chapter/segment numbers.

C. Cumulative Index

A cumulative alphabetical index correlating the various segments of coverage to their corresponding videos shall be supplied to the OWNER and ENGINEER.

### 3.5 PROCEDURAL REQUIREMENTS

A. General

The following procedures shall be implemented in the production of pre-construction color audio-video documentation. Above all, the documentation shall be executed in a conscientious and professional manner to assure the end product's maximum usefulness to the OWNER and ENGINEER.

B. Time of Execution

a. Recording Schedule - The recording shall be performed prior to the placement of any construction materials or equipment on the proposed construction site.

b. Visibility - All recording shall be performed during times of good visibility. No recording shall be done during periods of significant precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recordings, and to produce bright, sharp video recordings of those subjects.

C. Coverage Continuity

The recording shall commence at Station 0+00 of each line, and run continuously uninterrupted to its end. If hand held walking is necessary, it shall be done to insure a complete uninterrupted record.

D. Coverage Rates

The average rate of travel during a particular segment of coverage (e.g. coverage of one side of a street) shall be indirectly proportional to the number, size and value of the surface features within that construction area's zone of influence. The following table, which characterizes typical areas and sets the maximum average rates of travel in those areas, shall be used to establish approximate limits on actual average rates of travel:

	<u>Area</u>	<u>Typically Characterized By</u>	<u>Avg. Rate Max.</u>
a.	High Density (e.g. developed subdivisions)	Hard Surface Streets, Curbs, Drives & Sidewalks; 50 Ft. Lots; Very Few Empty Lots	30 Ft./Min.
b.	Med. Density (e.g. partially developed)	Gravel Roads, Hard & Soft Surface Drives, No sidewalks, Culverts & Headwalls, 100 Ft. Lots; Few Empty Lots	60 Ft./Min.
c.	Low Density (e.g. suburban or woods, occasional houses, fringe)	Gravel Roads, Small Fields	90 Ft./Min.
d.	Extra Low Density (e.g. rural)	Gravel Roads, Large Fields, Sparse Number of Houses	120 Ft./Min.

### **3.6 CAMERA POSITIONING AND STABILITY**

- a. Camera Height and Stability - When conventional wheeled vehicles are used as conveyances for the recording system, the distance between the camera lens and the ground shall not be more than 12 feet. The camera shall be firmly mounted, such that transport of the camera during the recording process will not cause an unsteady picture.
- b. Camera Control - Camera pan, tilt, zoom-in and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during video tape playback. In addition, all other camera and recording system controls, such as lens focus and aperture, video level, pedestal, chroma, white balance and electrical focus, shall be properly controlled or adjusted to maximize recorded picture quality.
- c. Viewer Orientation Techniques - The audio and video portions of the recording shall maintain viewer orientation. To this end, overall establishing views and visual displays of all visible house and building addresses shall be utilized. In easements where the proposed construction location will not be readily apparent to the video tape viewer, highly visible yellow flags shall be placed in such fashion as to clearly indicate the proposed center line of construction.

### **3.7 ENTERING PRIVATE PROPERTY**

When planning on entering private property, the CONTRACTOR shall notify the owner of such property to obtain his/her permission to do so. Should the owner of the property refuse to give his permission for said entry, the CONTRACTOR shall immediately notify the OWNER and ENGINEER, who will obtain the right to enter the property through the legal powers vested in the OWNER as a public entity. The CONTRACTOR is advised that he shall not enter any private property before permission is granted to do so, or the OWNER has notified the CONTRACTOR that he has gained the legal right to do so. The CONTRACTOR shall be liable for entry made other than as stated above.

### **PART 4 OWNER'S OPTIONS**

#### **A. Documentation Additions and Omission**

The OWNER and/or ENGINEER shall have the authority to designate what areas may be added to or omitted from the video tape documentation.

#### **B. Specification Deviations**

Any deviation from the above specifications must have the written approval of the OWNER.

### **PART 5 QUALIFICATIONS**

- 5.1** The video documentation shall be performed by a responsible firm known to be skilled and regularly engaged in the business of pre-construction color audio-video tape documentation. The firm shall furnish such information as the OWNER and ENGINEER deem necessary to determine the ability of that firm to perform the work in accordance with the contract specifications, including a list of former clients served in the last five (5) years.

### **PART 6 COORDINATION**

- 6.1** The CONTRACTOR shall coordinate the video recording with the construction schedule so that those portions of the construction that will be completed first will be recorded first. Construction shall not begin at any location until acceptable videos depicting the entire project area have been delivered to the OWNER and ENGINEER.

### **PART 7 VIDEO DELIVERY**

- 7.1** The CONTRACTOR shall deliver the video recordings to the OWNER and ENGINEER upon their completion as a whole, or upon request by the OWNER or ENGINEER, deliver specific video tape recordings to the OWNER and ENGINEER

upon their completion. Upon delivery and acceptance of the video, transfer of ownership of those video media shall be made to the OWNER.

**PART 8 UNACCEPTABLE DOCUMENTATION**

- 8.1** The OWNER or ENGINEER shall have the authority to reject all or any portion of the video documentation not conforming to specifications. Those rejected portions shall be redone by the CONTRACTOR at no additional cost to the OWNER.

END OF SECTION





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**SECTION 01041**  
**Project Coordination**

**PART 1 GENERAL**

**1.1 SCOPE**

- A. Management of the Project shall be through the use of a logical method of construction planning, inspection, scheduling and cost value documentation.
- B. The work under this Section includes all surface and subsurface condition inspections and coordination by the CONTRACTOR necessary for the proper and complete performance of the Work.
- C. This Section applies to the work of every division and every section of these Specifications.

**1.2 SITE CONDITIONS**

- A. Inspection
  - 1. Prior to performing any work under a section, the CONTRACTOR shall carefully inspect the installed work of other trades and verify that all such work is complete to the point where the work under that section may properly commence.
  - 2. The CONTRACTOR shall verify that all materials, equipment and products to be installed under a section may be installed in strict accordance with the original design and pertinent reviewed shop drawings.
- B. Discrepancies
  - 1. In the event of discrepancy, immediately notify the ENGINEER.
  - 2. Do not proceed with construction in areas of discrepancy until all such discrepancies have been fully resolved.

**1.3 COORDINATION**

- A. Carefully coordinate work with all other trades and subcontractors to insure proper and adequate interface of the work of other trades and subcontractors with the work of every section of these Specifications.

- B. The CONTRACTOR shall coordinate operations with all utility companies in or adjacent to the area of CONTRACTOR'S work. The CONTRACTOR shall require said utilities to identify in the field their property and provide drawings as necessary to locate them.

END OF SECTION

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**SECTION 01150**  
**Measurement and Payment**

**PART 1      GENERAL**

- 1.1 The CONTRACTOR shall provide all necessary labor, materials, tools, equipment, insurances, and permits, etc., and perform all other related work, as may be required for the Work in accordance with the applicable terms of these Specifications and other pertinent documents, etc.
- 1.2 The cost associated with the preparation of submittals as required or requested by the OWNER or ENGINEER and the preparation for and attendance at all project meetings shall be incidental to the work.
- 1.3 Items shown in the plans or discussed in the Contract Documents but not expressly described herein shall be considered incidental to the work.
- 1.4 Lump sum items shall be paid upon completion and acceptance of all work covered by the item. However, CONTRACTOR may submit an application for partial payment of lump sum items based upon an approved Schedule of Values. Such application shall be in writing and shall define and provide justification for desired break down (Schedule of Values) of the lump sum items. The application will be reviewed by the ENGINEER in a timely manner and any concerns will be discussed with the CONTRACTOR prior to issuing written agreement with the partial payment scheme. It is recommended that Partial Payment Applications be submitted and approval sought prior to the submission of the first invoice for the project.
- 1.5 The quantities shown are estimated. Only the actual quantities required, furnished, installed and/or removed, will be eligible for payment. No minimum(s) is/are guaranteed.
- 1.6 The CONTRACTOR will NOT be paid for any items herein in excess of the estimated quantities or for any items not contained in the proposal(s) unless the CONTRACTOR has obtained WRITTEN authorization from the ENGINEER before proceeding with the work.
- 1.7 The various phases of contractual work that are required to complete the subject project must be performed in a most expeditious manner and to the satisfaction of the ENGINEER and OWNER in order to qualify for full payment to the CONTRACTOR.

**PART 2      PAY ITEMS**

**2.1      WATER TANK**

- A. Measurement – No measurement shall be made. The CONTRACTOR may submit a Schedule of Values to the ENGINEER for review and approval prior to submittal of the first Partial Pay Estimate. The CONTRACTOR may also submit Partial Pay Estimates monthly containing an agreed upon estimated percentage of completion of the pay item.

- B. Payment - Payment shall be made based upon the lump sum Bid amount in the Bid Schedule. No pay item has been established for mobilization/demobilization, material delivery and/or storage, any required rigging, etc., safety protocols in compliance with applicable standards, nor for any other items not listed herein. That work is considered incidental and shall be included in the lump sum Bid referenced. Payment shall constitute full compensation for all work necessary to comply with any applicable laws and regulations and for providing a complete and functional tank to the OWNER.

## **2.2 TANK/CONTROL VALVE/BACKFLOW PREVENTER VAULTS**

- A. Measurement – No measurement shall be made. Valve Vaults and associated piping to be included for payment at the Lump Sum bid may be an estimated percentage of completion as approved by the ENGINEER. CONTRACTOR shall submit any information requested by the ENGINEER or OWNER to verify the estimated percentage of completion. Any required measurement shall be made in the field by the CONTRACTOR.

The CONTRACTOR may submit a Schedule of Values for consideration by the ENGINEER and OWNER.

CONTRACTOR shall note that the Tank Valve Vault Bid Item includes all 12" DIP piping and appurtenances within the tank site.

- B. Payment - Payment for the Valve Vaults shall be based upon the lump sum price as indicated in the Bid Schedule for a complete and functional system as described in the Contract Documents and shall constitute full compensation for all incidental items required including all materials, labor, sump pumps, drain lines, electrical work, vault hatch, fittings, unclassified excavation and equipment necessary.

## **2.3 ROOF CORRAL/HANDRAIL**

- A. Measurement - No measurement shall be made. The CONTRACTOR may submit a Schedule of Values to the ENGINEER for review and approval prior to submittal of the first Partial Pay Estimate. The CONTRACTOR may also submit Partial Pay Estimates monthly containing an agreed upon estimated percentage of completion.
- B. Payment - Payment shall be made based upon the lump sum Bid amount in the Bid Schedule. No separate pay item has been established for design, renderings, mobilization/demobilization, nor for any other incidental items not listed herein. That work is considered incidental and shall be included in the lump sum Bid. Payment shall constitute full compensation for all work necessary to comply with any applicable laws and regulations. Full payment shall not be due to the CONTRACTOR until all coatings work is complete and materials removed from the site and any remedial site restoration or cleanup work is completed by the CONTRACTOR.

## 2.4 TANK CONTAINMENT

- A. Measurement - No measurement shall be made. The CONTRACTOR may submit a Schedule of Values to the ENGINEER for review and approval prior to submittal of the first Partial Pay Estimate. The CONTRACTOR may also submit Partial Pay Estimates monthly containing an agreed upon estimated percentage of completion.
- B. Payment - Payment shall be made based upon the lump sum Bid amount in the Bid Schedule. No separate pay item has been established for design, mobilization/demobilization, erection, disassembly and removal of the containment system, nor for any other incidental items not listed herein. That work is considered incidental and shall be included in the lump sum Bid. Payment for containment shall constitute full compensation for all work necessary to comply with any applicable laws and regulations. Full payment shall not be due to the CONTRACTOR until all coatings work is complete and the containment system is fully disassembled, removed from the site and any remedial site restoration or cleanup work is completed by the CONTRACTOR.

## 2.5 TANK SIGN

- A. Measurement - No measurement shall be made. The CONTRACTOR may submit a Schedule of Values to the ENGINEER for review and approval prior to submittal of the first Partial Pay Estimate. The CONTRACTOR may also submit Partial Pay Estimates monthly containing an agreed upon estimated percentage of completion.
- B. Payment - Payment shall be made based upon the lump sum Bid amount in the Bid Schedule. No separate pay item has been established for design, renderings, mobilization/demobilization, nor for any other incidental items not listed herein. That work is considered incidental and shall be included in the lump sum Bid. Payment shall constitute full compensation for all work necessary to comply with any applicable laws and regulations. Full payment shall not be due to the CONTRACTOR until all coatings work is complete and materials removed from the site and any remedial site restoration or cleanup work is completed by the CONTRACTOR.

## 2.6 TANK SITE FENCING

- A. Measurement - No measurement shall be made. The CONTRACTOR may submit a Schedule of Values to the ENGINEER for review and approval prior to submittal of the first Partial Pay Estimate. If approved, this Schedule of Values will be utilized for the duration of the Work. The CONTRACTOR may also submit Partial Pay Estimates monthly containing an agreed upon estimated percentage of completion of the Work required under this Bid Item.
- B. Payment - Payment shall be made based upon the lump sum Bid amount in the Bid Schedule. No separate pay item has been established for design, mobilization/demobilization, materials, fittings, pipe supports, clamps, etc. nor for

any other incidental items not listed herein. That work is considered incidental and shall be included in the lump sum Bid. Payment shall constitute full compensation for all work necessary to comply with any applicable laws and regulations. Full payment shall not be due to the CONTRACTOR until all work is complete and excess materials removed from the site and any remedial site restoration or cleanup work is completed by the CONTRACTOR.

## **2.7 TANK ACCESS ROAD**

- A. Measurement - No measurement shall be made. The CONTRACTOR may submit a Schedule of Values to the ENGINEER for review and approval prior to submittal of the first Partial Pay Estimate. If approved, this Schedule of Values will be utilized for the duration of the Work. The CONTRACTOR may also submit Partial Pay Estimates monthly containing an agreed upon estimated percentage of completion of the Work required under this Bid Item.
- B. Payment - Payment shall be made at the contract unit price Bid in the Bid Schedule. No separate pay item has been established for mobilization/demobilization, unclassified excavation, supply and placement of crushed stone and filter fabric, compaction and any incidental items not listed herein. That work is considered incidental and shall be included in the unit price Bid shown on the Bid Schedule. Payment shall constitute full compensation for all work necessary to comply with any applicable laws and regulations.

## **2.8 WATER TANK COATINGS**

- A. This item pertains to Bid Items 8 and 9 in the Bid Schedule.
- B. Measurement – No measurement shall be made. The CONTRACTOR may submit a Schedule of Values to the ENGINEER for review and approval prior to submittal of the first Partial Pay Estimate. The CONTRACTOR may also submit Partial Pay Estimates monthly containing an agreed upon estimated percentage of completion of the Items listed in A. above.
- C. Payment - Payment shall be made based upon the lump sum Bid amount in the Bid Schedule. No pay item has been established for disposing of the blast material or for any work related to environmental concerns associated with the Work, any required rigging, etc., safety protocols in compliance with applicable standards, nor for any other incidental items not listed herein. That work is considered incidental and shall be included in the lump sum Bids referenced. Payment for coatings shall constitute full compensation for all work necessary for all coats to comply with any applicable laws and regulations and for providing a complete and functional system to the OWNER.

## **2.9 SIKA-FLEX 1A CAULKING**

- A. Measurement - Measurement shall be for each tube of Sika-Flex 1a caulking properly installed by the CONTRACTOR, in excess of the 50 linear feet included in the lump sum coatings bid(s), as directed and accepted by the ENGINEER. Partial tubes shall not be measured.

- B. Payment - Payment shall be made at the contract unit price Bid in the Bid Schedule. No separate pay item has been established for any incidental items not listed herein. That work is considered incidental and shall be included in the unit price Bid shown on the Bid Schedule. Payment shall constitute full compensation for all work necessary to comply with any applicable laws and regulations.

## **2.10 TANK MIXING SYSTEM**

- A. Measurement - No measurement shall be made. The CONTRACTOR may submit a Schedule of Values to the ENGINEER for review and approval prior to submittal of the first Partial Pay Estimate. The CONTRACTOR may also submit Partial Pay Estimates monthly containing an agreed upon estimated percentage of completion.
- B. Payment - Payment shall be made based upon the lump sum Bid amount in the Bid Schedule. No separate pay item has been established for design, mobilization/demobilization, surface preparation and coatings if required, electrical work, nor for any other incidental items not listed herein. That work is considered incidental and shall be included in the lump sum Bid. Payment shall constitute full compensation for all work necessary to comply with any applicable laws and regulations. Full payment shall not be due to the CONTRACTOR until all coatings work is complete and the system is started up and fully functional.

## **2.11 WATER LINES**

- A. Measurement - Measurement for the length of pipe to be included for payment at the unit prices bid for all sizes shall be the actual length laid in the trench measured along the centerline of the pipe and including the lengths of and all fittings in the line. Measurement shall begin at the ends of existing pipes, valves or fittings to which the new pipe is connected or such other point as may be designated on the plans.
- B. Payment - Payment for installing only water pipelines complete in place will be made at the contract unit price bid per linear foot for water pipe of the various sizes and classifications. No pay item has been established for fittings, restraint joints or thrust blocking. These are considered incidental and shall be included in the unit price bid per linear foot for water pipe. Payment for installing water pipe shall constitute full compensation for trenching, installation of pipe, backfill, thrust blocking, disinfecting and testing for the water line, together with other incidental and related work necessary for the completion of the water main installation except that valves, valve boxes, pavement replacement and such other bid items shall be paid for separately, if included as a pay item on the bid proposal. Any items or appurtenances required for water line installation in accordance with the contract documents that do not have specific bid items shall be considered incidental and shall be included in the unit price bid for water lines.

## 2.12 VALVES

- A. Measurement - Valves will be measured by actual count on each size and type of valve installed in the completed Work. This includes gate valves with meter taps.
- B. Payment - Payment for installing only valves of the various sizes and classifications, accessories, adapters, extension stems, valve boxes with lids, formed and poured in place concrete collar or other required appurtenances, shall be made on the basis of the contract unit prices bid. Such payment shall constitute full compensation for installing the valves complete in place and in full accordance with the Plans and Specifications.

Removal of existing valves is considered to be incidental to the Work.

## 2.13 12" x 6" CONNECTIONS TO EXISTING LINES

- A. Measurement – Connections to existing lines shall be sized as shown on the plans and include all fittings, appurtenances and thrust blocking required to make the connection. Valves required to make the connection are to be included in the measurement for Connections and shall be paid for under this bid item. Water lines of all sizes required to make the connection are also included in the measurement and shall be included in the price to be paid for Bid Item 15. Measurement of Connections to existing water lines shall be by an actual count of connections of the various sizes made. The number, variety, material, etc. of all required fittings shall not be measured and shall be considered incidental to the required Work. It is the CONTRACTOR's responsibility to determine what materials, fittings, etc are required and to provide and install them as needed in accordance with the Contract Documents and subject to the OWNER's approval.
- B. Payment – Connections to existing lines installed and accepted will be paid for on the basis of the lump sum price bid for the various sized connections. This price shall constitute payment for furnishing, hauling, installing complete in place, testing and sterilizing, excavation, preparation of bed and backfilling, thrust blocking and for furnishing of all equipment, tools and incidentals necessary to complete the item.

No payment shall be made for other connections to any other existing water lines beyond the 12" x 6" connection shown on sheet 7 of the Plans. All other connections to existing lines are considered to incidental to the work and shall be included in the unit bid price for water lines.

## 2.14 CASING PIPE BY OPEN CUT

- A. Measurement - Measurement of casing pipe installed under pavement, railroad tracks, structures or other places by open cut shall be by the linear foot and shall be the centerline length of the steel casing pipe installed and accepted.



- B. Payment - Payment shall be made on the basis of the contract unit price bid for various diameters. This price shall constitute payment for furnishing and installing casing pipe by open cut, end seals and spacers; including all labor, unclassified excavation, materials, tools and equipment. Payment for the water line to be installed in the casing pipe shall be paid for at applicable unit price bid.

## **2.15 RELOCATE FIRE HYDRANT**

- A. Measurement – Fire Hydrant Relocation shall be measured by the actual count of relocated fire hydrants installed in the completed work. Connections to existing lines shall be sized as shown on the plans and include all fittings, appurtenances and thrust blocking required to make the connection. Valves required are to be included in the measurement for hydrant relocations and shall be paid for under this bid item. Water lines of all sizes required to make the connections are also included in the measurement and shall be included in the price to be paid for Bid Item 17. The number, variety, material, etc. of all required fittings shall not be measured and shall be considered incidental to the required Work. It is the CONTRACTOR's responsibility to determine what materials, fittings, etc are required and to provide and install them as needed in accordance with the Contract Documents and subject to the OWNER's approval. Any required 6" PVC water main (min SDR21) is included in the bid item, as is the installation of one (1) 6" gate valve if required.
- B. Payment – Fire hydrant relocations installed and accepted will be paid for on the basis of the lump sum price bid. This price shall constitute payment for furnishing, hauling, installing complete in place, testing and sterilizing, excavation, preparation of bed and backfilling, thrust blocking and for furnishing of all equipment, tools, labor, materials and incidentals necessary to complete the item.

## **2.16 TRACER WIRE**

- A. Measurement – Measurement for No. 10 Copper Tracer Wire to be included for payment at the unit price bid shall be equal to the length of water main of all sizes installed and shall be taped or otherwise secured to the pipe, installed in valve boxes, etc.
- B. Payment - Payment shall be made on the basis of the contract unit price for a complete functioning system, including sealed splices, taping to pipe and connections/installations in valve boxes, etc. This price shall constitute payment for furnishing and installing tracer wire including all labor, tools, materials and equipment.

## **2.17 CRUSHED STONE**

- A. Measurement - Measurement of crushed stone for payment shall be based on linear feet of gravel replaced and shall be full depth of trench. Measurement shall be equal to the length, in linear feet, of stone installed on the trench surface as measured along the centerline of the installed water main. Minimum width shall be equal to the nominal diameter of pipe installed plus 3'-6". This item will be paid for based upon amount disturbed and shall be only a one-time payment.

Crushed stone used for bedding water mains in rock excavation shall be based on tons of stone placed in accordance with the Contract Documents and Details. Payment shall be based upon amount distributed and only a one-time payment. Crushed stone used for backfilling around valves and fire hydrants shall be included in the unit price for valves or fire hydrants.

Crushed stone used as base material or backfill for pavement replacement also will not be measured for payment inasmuch as payment for this material will be included in the payment for pavement replacement.

- B. Payment - Payment for crushed stone, measured as provided above, shall constitute full compensation for furnishing, hauling, placing and compacting the stone as specified in the Contract Documents and will be a one-time payment. No additional compensation will be due to the CONTRACTOR for additional stone added to compensate for settlement or other factors.

## **2.18 BITUMINOUS/CONCRETE PAVEMENT REPLACEMENT**

- A. Measurement - Measurement for bituminous or concrete pavement replacement shall be equal to the length, in linear feet, of the pavement installed, as measured along the centerline of the water main. Minimum width shall be equal to the nominal pipe diameter plus 3'-6" centered over the pipeline. For pavement replacement on State or Federal Highways where concrete base is required, the minimum width will be increased to 7'-6". The installed pavement must be at least as thick as the existing surrounding pavement in order to be measured. Existing paving shall be saw cut to provide a smooth and straight edge for the transition from new pavement to existing.
- B. Payment - Payment for pavement replacement shall be made on the basis of the unit prices bid for various classifications of pavements indicated in the proposal form. Such payment shall constitute full compensation for furnishing all labor, material, and equipment and replacing the damaged pavement, including the crushed stone base and crushed stone backfill as required. The CONTRACTOR is advised that although the limits of payment shall be as described under paragraph A above, he shall be responsible for replacing all pavement damaged during construction, at no additional cost, so that the paved area is left in a condition as good as or better than before the start of construction, which will be documented in the pre-construction video.

Payment for pavement replacement shall also include compensation for providing temporary pavement patches as required by the specifications and for maintaining the patches until such time as the permanent pavement is placed inasmuch as no separate payment will be made for this work.

**2.18 VIDEOTAPING**

- A. Measurement – No measurement shall be made in the field. Work related to this item shall be considered complete when accepted by the ENGINEER. In order to be considered compliant with the Contract Documents, a complete and fully functional video must be delivered and accepted by the ENGINEER prior to mobilization to the site by the CONTRACTOR.
- B. Payment - Payment shall be made based upon the lump sum Bid amount in the Bid Schedule. No separate pay item has been established for any portion of this item. Payment shall constitute full compensation for all work necessary to comply with the Contract Documents. Full payment shall not be due until the CONTRACTOR has satisfactorily completed all work directed by the ENGINEER and all remedial work is complete by the CONTRACTOR.

**2.20 BOOSTER PUMP STATION**

- A. Measurement – No measurement shall be made. Pump Station and associated work to be included for payment at the Lump Sum bid may be an estimated percentage of completion as approved by the ENGINEER. CONTRACTOR shall submit any information requested by the ENGINEER or OWNER to verify the estimated percentage of completion. Any required measurement shall be made in the field by the CONTRACTOR.

The CONTRACTOR may submit a Schedule of Values for consideration by the ENGINEER and OWNER.

- B. Payment - Payment for the booster pump station shall be based upon the lump sum price as indicated in the Bid Schedule for a complete and functional system as described in the Contract Documents and shall constitute full compensation for all incidental items required including all materials, labor, sump pumps, unclassified excavation, electrical work, vault hatch, fittings, foundation and equipment necessary to provide a fully functional pump station.

**2.21 SCADA SYSTEM**

- A. Measurement - Measurement for SCADA system to be included for payment at the Lump Sum bid shall be an estimated percentage of completion as approved by the ENGINEER. CONTRACTOR shall submit any information requested by the ENGINEER or OWNER to verify the estimated percentage of completion. Proposed measurement shall be made in the field by the CONTRACTOR.

The CONTRACTOR may submit a Schedule of Values for consideration by the ENGINEER and OWNER.

- B. Payment - Payment for the SCADA System shall be based upon a lump sum price as indicated in the Bid Schedule for a complete and functional system as described in the Contract Documents and shall constitute full compensation for all incidental items required.

Any excavation required is not a significant part of the Work in this item, and is therefore not a pay item. Some excavation work will be necessary for, at a minimum, the installation of the mounting brackets. Any excavation required for the Work is considered to be incidental to the Work and shall not be measured or paid separately.

## 2.22 OTHER INCIDENTALS

- A. Any items not expressly listed herein shall be considered incidental to the Work and are to be included in the various Bid Items contained on the Bid Schedule. The CONTRACTOR is not entitled to any compensation for any item of work done at any time outside of those listed herein without written approval of the ENGINEER and OWNER.

The following work items are not separate pay items and are considered incidental to the pay items listed above.

- Conduit and installation
- Wiring and installation
- Electrical work
- Erosion control
- Cleanup and site restoration – the CONTRACTOR is expected to clean up and restore any site impacted by the Work to its pre-construction conditions, as verified by the required Videotaping.

## 2.23 ROCK EXCAVATION

ALL excavation is unclassified; therefore, separate measurement or payment for rock excavation will not be made.

END OF SECTION

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**SECTION 01200**  
**Project Meetings**

**PART 1 GENERAL**

**1.1 SCOPE**

- A. Work under this Section includes all scheduling and administering of pre-construction and progress meetings as herein specified and necessary for the proper and complete performance of this Work.
- B. Scheduling and Administration by ENGINEER:
  - 1. Prepare agenda.
  - 2. Make physical arrangements for the meetings, in conjunction with the OWNER.
  - 3. Preside at meetings.
  - 4. Record summary and include significant proceedings and decisions.
  - 5. Distribute copies of the summary to participants.

**1.2 PRE-CONSTRUCTION CONFERENCE**

- A. The ENGINEER shall schedule the preconstruction conference prior to the issuance of the Notice to Proceed.
- B. Representatives of the following parties are to be in attendance at the meeting:
  - 1. OWNER.
  - 2. ENGINEER.
  - 3. CONTRACTOR and superintendent.
  - 4. Major subcontractors.
  - 5. Representatives of governmental or regulatory agencies when appropriate.
- C. The agenda for the Pre-Construction Conference shall consist of the following as a minimum:

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**Project Meetings**

1. Distribute and discuss a list of major subcontractors and a tentative construction schedule.
2. Critical work sequencing.
3. Designation of responsible personnel and emergency telephone numbers.
4. Processing of field decisions and Change Orders.
5. Adequacy of distribution of Contract Documents.
6. Schedule and submittal of shop drawings, product data and samples.
7. Pay request format, submittal cutoff date, pay date (if known) and retainage.
8. Procedures for maintaining record documents.
9. Use of premises, including office and storage areas and OWNER's requirements.
10. Major equipment deliveries and priorities.
11. Safety and first aid procedures.
12. Security procedures.
13. Housekeeping procedures.
14. Work hours.

**1.3 PROJECT COORDINATION/PROGRESS MEETINGS**

- A. The CONTRACTOR shall attend regular monthly meetings as scheduled by the ENGINEER/OWNER.
- B. The CONTRACTOR shall attend and/or request called meetings as the progress of the Work dictates.
- C. The meetings shall be held at the location indicated by the ENGINEER/OWNER.

D. Representatives of the following parties are to be in attendance at the meetings:

1. ENGINEER.
2. CONTRACTOR and superintendent.
3. Major subcontractors as pertinent to the agenda.
4. OWNER's representative as appropriate.
5. Representatives of governmental or other regulatory agencies as appropriate.

E. The minimum agenda for Progress Meetings shall consist of the following:

1. Review work progress since last meeting.
2. Note field observations, problems and decisions.
3. Identify problems which impede planned progress.
4. Review off-site fabrication problems.
5. Review CONTRACTOR's corrective measures and procedures to regain plan schedule.
6. Review CONTRACTOR's revision to the construction schedule as outlined in the Supplementary Conditions.
7. Review submittal schedule; expedite as required to maintain schedule.
8. Maintenance of quality and work standards.
9. Review changes proposed by OWNER for their effect on the construction schedule and completion date.
10. Complete other current business.

END OF SECTION





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## SECTION 01340

### Shop Drawings, Product Data and Samples

#### **PART 1 GENERAL**

##### **1.1 SCOPE**

- A. The work under this Section includes submittal to the ENGINEER of shop drawings, product data and samples required by the various sections of these Specifications.
- B. Submittal Contents: The submittal contents required are specified in each section.
- C. The following forms shall be used for all major components of the work:
  - 1. Typical Maintenance Summary Form
  - 2. Notice of Start of Manufacturing
  - 3. Notice of Shipment of Equipment
  - 4. Notice of Schedule Impact

The forms are included at the back of this section.

- D. Definitions: Submittals are categorized as follows:
  - 1. Shop Drawings
    - a. Shop drawings shall include technical data, drawings, diagrams, procedure and methodology, performance curves, schedules, templates, patterns, test reports, calculations, instructions, measurements and similar information as applicable to the specific item for which the shop drawing is prepared.
    - b. Provide newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated) or appropriate number of prints hereof, with name or preparer (firm name) indicated. The Contract Drawings shall not be traced or reproduced by any method for use as or in lieu of detail shop drawings. Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards and special coordination requirements. Do not allow shop drawing copies without appropriate final "Action" markings by the

ENGINEER to be used in connection with the Work.

- c. Drawings shall be presented in a clear and thorough manner. Details shall be identified by reference to sheet and detail, specification section, schedule or room numbers shown on the Contract Drawings.
- d. Minimum assembly drawings sheet size shall be 24 x 36-inches.
- e. Minimum detail sheet size shall be 8-1/2 x 11-inches.
- f. Minimum Scale:
  - (1) Assembly Drawings Sheet, Scale: 1-inch = 30 feet.
  - (2) Detail Sheet, Scale: 1/4-inch = 1 foot.

## 2. Product Data

- a. Product data includes standard printed information on materials, products and systems, not specially prepared for this Project, other than the designation of selections from among available choices printed therein.
- b. Collect required data into one submittal for each unit of work or system, and mark each copy to show which choices and options are applicable to the Project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked and special coordination requirements.

## 3. Samples

- a. Samples include both fabricated and un-fabricated physical examples of materials, products and units of work, both as complete units and as smaller portions of units of work, either for limited visual inspection or, where indicated, for more detailed testing and analysis.
- b. Provide units identical with final condition of proposed materials or products for the work. Include "range" samples, not less than three units, where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where the ENGINEER'S selection is required. Prepare samples to match the ENGINEER'S sample where indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and "kind" by the ENGINEER. ENGINEER will note "test" samples, except as

otherwise indicated, for other requirements, which are the exclusive responsibility of the CONTRACTOR.

4. Miscellaneous submittals related directly to the Work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the Work but not processed as shop drawings, product data or samples.

## **1.2 SPECIFIC CATEGORY REQUIREMENTS**

- A. General: Except as otherwise indicated in the individual work sections, comply with general requirements specified herein for each indicated category of submittal. Submittals shall contain:
  1. The date of submittal and the dates of any previous submittals.
  2. The Project title.
  3. Numerical submittal numbers, starting with 1.0, 2.0, etc. Revisions to be numbered 1.1, 1.2, etc.
  4. The Names of:
    - a. CONTRACTOR
    - b. Supplier
    - c. Manufacturer
  5. Identification of the product, with the Specification section number, permanent equipment tag numbers and applicable Drawing No.
  6. Field dimensions, clearly identified as such.
  7. Relation to adjacent or critical features of the Work or materials.
  8. Applicable standards, such as ASTM or Federal Specification numbers.
  9. Notification to the ENGINEER in writing, at time of submissions, of any deviations on the submittals from requirements of the Contract Documents.
  10. Identification of revisions on resubmittals.

11. An 8 x 3-inch blank space for CONTRACTOR and ENGINEER stamps.
12. CONTRACTOR'S stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria and coordination of the information within the submittal with requirements of the Work and of Contract Documents.
13. Submittal sheets or drawings showing more than the particular item under consideration shall have all but the pertinent description of the item for which review is requested crossed out.

### **1.3 ROUTING OF SUBMITTALS**

- A. Submittals and routine correspondence shall be routed as follows:
  1. Supplier to CONTRACTOR (through representative if applicable)
  2. CONTRACTOR to ENGINEER
  3. ENGINEER to CONTRACTOR and OWNER
  4. CONTRACTOR to Supplier

### **1.4 ADDRESS FOR COMMUNICATIONS**

Engineer: HMB Professional Engineers, Inc.  
3 HMB Circle  
Frankfort, KY 40601  
OFFICE (502) 695-9800  
FAX (502) 695-9810

## **PART 2 PRODUCTS**

### **2.1 SHOP DRAWINGS**

- A. Unless otherwise specifically directed by the ENGINEER, make all shop drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the Work.
- B. Submit all shop assembly drawings, larger than 11 x 17-inches, in the form of opaque prints.
- C. Submit all shop drawings, 11 x 17-inches and smaller, in the form of opaque prints.

- D. One reproducible for all submittals larger than 11 x 17-inches and no more than three prints of other submittals will be returned to the CONTRACTOR.
- E. Six (6) sets of shop drawings are required by the ENGINEER. This total includes one (1) set of marked shop drawings to be returned to the CONTRACTOR. It is the CONTRACTOR's responsibility to submit additional sets of shop drawings if needed for the CONTRACTOR's suppliers, etc.

## **2.2 MANUFACTURER'S LITERATURE**

- A. Where content of submitted literature from manufacturers includes data not pertinent to this submittal, clearly indicate which portion of the contents is being submitted for the ENGINEER'S review.
- B. Submit the number of copies which are required to be returned (not to exceed three) plus three copies which will be retained by the ENGINEER.

## **2.3 SAMPLES**

- A. Samples shall illustrate materials, equipment or workmanship and established standards by which completed work is judged.
- B. Unless otherwise specifically directed by the ENGINEER, all samples shall be of the precise article proposed to be furnished.
- C. Submit all samples in the quantity which is required to be returned plus two (2) samples which will be retained by the ENGINEER and OWNER.

## **2.4 COLORS**

- A. Unless the precise color and pattern is specifically described in the Contract Documents, wherever a choice of color or pattern is available in a specified product, submit accurate color charts and pattern charts to the ENGINEER for review and selection by the OWNER.
- B. Unless all available colors and patterns have identical costs and identical wearing capabilities, and are identically suited to the installation, completely describe the relative costs and capabilities of each.

## **2.5 PROJECT SCHEDULE**

Time is of the essence in the completion of the Project.

Upon request of the OWNER/ENGINEER, the CONTRACTOR shall submit a complete project schedule, showing all aspects of project requirements from start to finish. It is the CONTRACTOR's responsibility to keep the schedule up to date and to adjust and provide a

new schedule at any time during construction and upon the request of the ENGINEER or OWNER.

At the discretion of the ENGINEER or OWNER, payment may be withheld from the CONTRACTOR due to failure to adequately supply project scheduling.

## **PART 3 EXECUTION**

### **3.1 CONTRACTOR'S COORDINATION OF SUBMITTALS**

- A. Prior to submittal for the ENGINEER'S review, the CONTRACTOR shall use all means necessary to fully coordinate all material, including the following procedures:
1. Determine and verify all field dimensions and conditions, catalog numbers and similar data.
  2. Coordinate as required with all trades and all public agencies involved.
  3. Submit a written statement of review and compliance with the requirements of all applicable technical Specifications as well as the requirements of this Section.
  4. *Upon request of the ENGINEER or OWNER, clearly indicate in writing on the manufacturer's or fabricator's letterhead, **any and all deviations** from the Contract Documents.*
- B. Each and every copy of the shop drawings and data shall bear the CONTRACTOR'S stamp showing that they have been so checked. Shop drawings submitted to the ENGINEER without the CONTRACTOR'S stamp will be returned to the CONTRACTOR for conformance with this requirement.
- C. The OWNER may backcharge the CONTRACTOR for costs associated with having to review a particular shop drawing, product data or sample more than two times to receive a "No Exceptions Taken" mark. Any such backcharge may be in the form of withholding from Partial Payment Requests and/or in the form of a Change Order to the Contract.
- D. Grouping of Submittals
1. Unless otherwise specifically permitted by the ENGINEER, make all submittals in groups containing all associated items.
  2. No review will be given to partial submittals of shop drawings for items which interconnect and/or are interdependent. It is the CONTRACTOR'S responsibility to assemble the shop drawings for all such interconnecting

and/or interdependent items, check them and then make one submittal to the ENGINEER along with CONTRACTOR'S comments as to compliance, non-compliance or features requiring special attention.

- E. Schedule of Submittals: Within 30 days of Contract Award and prior to any shop drawing submittal, the CONTRACTOR shall submit a schedule showing the estimated date of submittal and the desired approval date for each shop drawing anticipated. A reasonable period shall be scheduled for review and comments. Time lost due to unacceptable submittals shall be the CONTRACTOR'S responsibility and time allowance for resubmittal shall not be provided. The schedule shall provide for submittal of items which relate to one another to be submitted concurrently.

### **3.2 TIMING OF SUBMITTALS**

- A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal, and for placing orders and securing delivery.
- B. In scheduling, allow sufficient time for the ENGINEER'S review following the receipt of the submittal.

### **3.3 REVIEWED SHOP DRAWINGS**

- A. ENGINEER Review
  - 1. Allow a minimum of 14 calendar days for the ENGINEER'S initial processing of each submittal requiring review and response, except allow longer periods where processing must be delayed for coordination with subsequent submittals. The ENGINEER will advise the CONTRACTOR promptly when it is determined that a submittal being processed must be delayed for coordination. Allow a minimum of two weeks for reprocessing each submittal. Advise the ENGINEER on each submittal as to whether processing time is critical to progress of the Work, and therefore the Work would be expedited if processing time could be foreshortened.
  - 2. Acceptable submittals will be marked "No Exceptions Taken". A minimum of four (4) copies will be retained by the ENGINEER for ENGINEER'S and the OWNER'S use and the remaining copies will be returned to the CONTRACTOR.
  - 3. Submittals requiring minor corrections before the product is acceptable will be marked "Make Corrections Noted". The CONTRACTOR may order, fabricate and ship the items included in the submittals, provided the indicated corrections are made.

4. Submittals marked "Amend and Resubmit" must be revised to reflect required changes and the initial review procedure repeated.
  5. The "Rejected" notation is used to indicate products which are not acceptable. Upon return of a submittal so marked, the CONTRACTOR shall repeat the initial review procedure utilizing acceptable products.
  6. Only two copies of items marked "Rejected" will be reviewed and marked. One copy will be retained by the ENGINEER and the other copy with all remaining unmarked copies will be returned to the CONTRACTOR for resubmittal.
- B. No work or products shall be installed without a drawing or submittal bearing the "No Exceptions Taken" or "Make Corrections Noted" notation. The CONTRACTOR shall maintain at the job site a complete set of shop drawings bearing the ENGINEER'S stamp.
- C. Substitutions: In the event the CONTRACTOR obtains the ENGINEER'S approval for the use of products other than those which are listed first in the Contract Documents, the CONTRACTOR shall, at the CONTRACTOR'S own expense and using methods approved by the ENGINEER, make any changes to structures, piping and electrical work that may be necessary to accommodate these products.
- D. Use of the "No Exceptions Taken" notation on shop drawings or other submittals is general and shall not relieve the CONTRACTOR of the responsibility of furnishing products of the proper dimension, size, quality, quantity, materials and all performance characteristics, to efficiently perform the requirements and intent of the Contract Documents. The ENGINEER'S review shall not relieve the CONTRACTOR of responsibility and/or liability for errors of any kind on the shop drawings, installation, workmanship, etc. of any portion of the Work. Review is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The CONTRACTOR is responsible for dimensions to be confirmed and correlated at the job site. The CONTRACTOR is also responsible for information that pertains solely to the fabrication processes or to the technique of construction and for the coordination of the work of all trades.

### **3.4 RESUBMISSION REQUIREMENTS**

- A. Shop Drawings
1. Revise initial drawings as required and resubmit as specified for initial submittal, with the resubmittal number shown.
  2. Indicate on drawings all changes which have been made other than those requested by the ENGINEER.



- B. Project Data and Samples: Resubmit new data and samples as specified for initial submittal, with the resubmittal number shown.

END OF SECTION TEXT

FORMS FOLLOW

TYPICAL MAINTENANCE SUMMARY FORM

1. EQUIPMENT ITEM
2. MANUFACTURER
3. EQUIPMENT IDENTIFICATION NUMBER(S)
4. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS)
5. NAMEPLATE DATA (hp, voltage, speed, etc.)
6. MANUFACTURER'S LOCAL REPRESENTATIVE

Name \_\_\_\_\_ Telephone No.  
Address

## 7. MAINTENANCE REQUIREMENTS

<b>Maintenance Operation</b>	<b>Frequency</b>	<b>Lubricant (If Applicable)</b>	<b>Comments</b>
List briefly each maintenance operation req'd and refer to specific information in mfr's std. maintenance manual, if applicable.	List req'd frequency of each maintenance operation.	Refer by symbol to lubricant req'd.	

## 8. LUBRICANT LIST

<b>Reference Symbol</b>	<b>Shell</b>	<b>Std. Oil</b>	<b>Gulf</b>	<b>Arco</b>	<b>Or Equal</b>
List symbols used in Item 7. above.	List equivalent lubricants, as distributed by each Manufacturer for the specific use recommended.				

9. SPARE PARTS. Include your recommendations regarding what spare part, if any, should be kept on the job.

Shop Drawings, Product Data and Samples

NOTICE OF START OF MANUFACTURING

DATE:

TO:

ATTENTION:

RE: Equipment Contract No.

Name of Contract:

Type of Equipment:

Quantity:

Scheduled Completion of Assembly:

Scheduled Date of Shipment:

NOTE: Delay to the above schedule which will affect shipment date by 5 days or more must be reported on the Schedule Impact form.

By: \_\_\_\_\_ Date:

Title:

ACTUAL MANUFACTURING AGENT:

Name:

Address:

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Telephone:

NOTICE OF SHIPMENT OF EQUIPMENT

DATE:

TO:

ATTENTION:

RE: Equipment Contract No.

Name of Contract:

Type of Equipment Being Shipped:

QTY. DESCRIPTION (Include Equipment Numbers) SERIALS (If Applicable):

ATTACH BILL(S) OF LADING FOR ALL SHIPMENTS TO THIS FORM

Date of Shipment:

By:

Title:

ACTUAL MANUFACTURING AGENT:

Name:

Address:

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Telephone:

NOTICE OF SCHEDULE IMPACT

(Send this form to the OWNER and ENGINEER if delay is over 5 days)

DATE:

TO:

ATTENTION:

RE: Equipment Contract No.

Name of Contract:

Type of Equipment Affected:

Nature of Delay:

New Estimated Date for Final Shop Drawings:

New Estimated Date for Start of Manufacture:

New Estimated Date for Finish Manufacture:

New Estimated Date for Shipment:

New Estimated Date for Arrival at Jobsite:

By:

Title:

ACTUAL MANUFACTURING AGENT:

Name:

Address:

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Telephone:



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## **SECTION 01562**

### **Dust Control**

#### **PART 1 GENERAL**

##### **1.1 SCOPE**

CONTRACTOR shall limit blowing dust caused by construction operations by applying water or employing other appropriate means or methods to maintain dust control, subject to the approval of the OWNER. At a minimum, this may require the use of a water wagon twice a day to suppress dusty conditions.

##### **1.2 PROTECTION OF ADJACENT PROPERTY**

- A. The Bidders shall visit the site and note the buildings, landscaping, roads, parking areas and other facilities near the Work site that may be damaged by their operations. The CONTRACTOR shall make adequate provision to fully protect the surrounding area and will be held fully responsible for all damages resulting from CONTRACTOR'S operations.
- B. Protect all existing facilities (indoors or out) from damage by dust, fumes, spray or spills (indoors or out). Protect motors, bearings, electrical gear, instrumentation and building or other surfaces from dirt, dust, welding fumes, paint spray, spills or droppings causing wear, corrosion, malfunction, failure or defacement by enclosure, sprinkling or other dust palliatives, masking and covering, exhausting or containment.

END OF SECTION





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**SECTION 01610**  
**Transportation and Handling**

**PART 1 GENERAL**

**1.1 SCOPE**

- A. The CONTRACTOR shall provide transportation of all equipment, materials and products furnished under these Contract Documents to the Work site. In addition, the CONTRACTOR shall provide preparation for shipment, loading, unloading, handling and preparation for installation and all other work and incidental items necessary or convenient to the CONTRACTOR for the satisfactory prosecution and completion of the Work.
- B. All equipment, materials and products damaged during transportation or handling shall be repaired or replaced by the CONTRACTOR at no additional cost to the OWNER prior to being incorporated into the Work.

**1.2 TRANSPORTATION**

- A. All equipment shall be suitably boxed, crated or otherwise protected during transportation.
- B. Where equipment will be installed using existing cranes or hoisting equipment, the CONTRACTOR shall ensure that the weights of the assembled sections do not exceed the capacity of the cranes or hoisting equipment.
- C. Small items and appurtenances such as gauges, valves, switches, instruments and probes which could be damaged during shipment shall be removed from the equipment prior to shipment, packaged and shipped separately. All openings shall be plugged or sealed to prevent the entrance of water or dirt.

**1.3 HANDLING**

- A. All equipment, materials and products shall be carefully handled to prevent damage or excessive deflections during unloading or transportation.
- B. Lifting and handling drawings and instructions furnished by the manufacturer or supplier shall be strictly followed. Eyebolts or lifting lugs furnished on the equipment shall be used in handling the equipment. Shafts and operating mechanisms shall not be used as lifting points. Spreader bars or lifting beams shall be used when the distance between lifting points exceeds that permitted by standard industry practice.

- C. Under no circumstances shall equipment or products such as pipe, structural steel, castings, reinforcement, lumber, piles, poles, etc., be thrown or rolled off of trucks onto the ground.
- D. Slings and chains shall be padded as required to prevent damage to protective coatings and finishes.

END OF SECTION

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**SECTION 01630**  
**Substitutions and Options**

**PART 1 GENERAL**

**1.1 SCOPE**

This Section outlines the restrictions and requirements for substitutions, product and manufacturer options, and construction method options.

**1.2 DEFINITIONS**

- A. For the purposes of these Contract Documents, a "substitute item" shall be defined as one of the following:
1. A product or manufacturer offered as a replacement to a specified product or manufacturer.
  2. A product or manufacturer offered in addition to a specified product or manufacturer.
- B. For the purposes of these Contract Documents, a "substitute construction method" shall be defined as one of the following:
1. A mean, method, technique, sequence or procedure of construction offered as a replacement for a specified mean, method, technique, sequence or procedure of construction.
  2. A mean, method, technique, sequence or procedure of construction offered in addition to a specified mean, method, technique, sequence or procedure of construction.

**1.3 GENERAL**

- A. An item or construction method, which is offered where no specific product, manufacturer, mean, method, technique, sequence or procedure of construction is specified or shown on the Drawings, shall not be considered a substitute and shall be at the option of the CONTRACTOR, subject to the provisions in the Contract Documents for that item or construction method.

- B. For products specified only by a referenced standard, the CONTRACTOR may select any product by any manufacturer, which meets the requirements of the Specifications, unless indicated otherwise in the Contract Documents.
- C. If the manufacturer is named on the Drawings or in the Specifications as an acceptable manufacturer, products of that manufacturer meeting all requirements of the Specifications and Drawings are acceptable.
- D. Whenever the ENGINEER'S design is based on a specific product of a particular manufacturer, that manufacturer will be shown on the Drawings and/or listed first in the list of approved manufacturers in the Specifications. Any Bidder intending to furnish products of other than the first listed manufacturer, or furnish substitute items, shall
  - 1. Verify that the item being furnished will fit in the space allowed, perform the same functions and have the same capabilities as the item specified.
  - 2. Include in its Bid the cost of all accessory items which may be required by the other listed substitute product,
  - 3. Include the cost of any architectural, structural, mechanical, piping, electrical or other modifications required, and
  - 4. Include the cost of required additional work by the ENGINEER or OWNER, if any, to accommodate the item.

#### **1.4 APPROVALS**

- A. Approval of a substitution as an acceptable manufacturer by the ENGINEER or OWNER is dependent on determination that the product offered
  - 1. Is essentially equal in function, performance, quality of manufacture, ease of maintenance, reliability, service life and other criteria to that on which the design is based, and
  - 2. Will require no major modifications to structures, electrical systems, control systems or piping systems.

#### **1.5 SUBSTITUTIONS AND OPTIONS**

- A. See Bid Schedule for allowance of substitutions.

B. After Notice to Proceed

1. Substitute items will be considered for acceptable manufacturers in the Specification.
2. Where items are specified by referenced standard or specified as indicated in Article 1.3, Paragraph A. above, such items shall be submitted to the ENGINEER and OWNER for review.
3. The CONTRACTOR shall submit shop drawings on the substitute item for the ENGINEER'S review in accordance with Section 01340.

C. Prior to Opening of Bids

1. No consideration or approvals will be made for products specified by a referenced standard, or specified as indicated in Article 1.3, Paragraph A. above. Such consideration may occur only after the Notice to Proceed.
2. No consideration or approvals will be made for products being offered where the term "equal to" precedes the name of an approved product. Such substitution consideration may occur only after the Notice to Proceed.

END OF SECTION



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## **SECTION 01710**

### **Cleaning**

#### **PART 1 GENERAL**

##### **1.1 SCOPE**

This Section covers the general cleaning which the CONTRACTOR shall be required to perform both during construction and before final acceptance of the Project unless otherwise shown on the Drawings or specified elsewhere in these Specifications.

##### **1.2 QUALITY ASSURANCE**

- A. The CONTRACTOR shall daily, and more often if necessary, conduct inspections verifying that requirements of cleanliness are being met.
- B. The CONTRACTOR shall, in addition to the standards described in this Section, comply with all pertinent requirements of governmental agencies having jurisdiction.

##### **1.3 HAZARDOUS MATERIAL AND WASTE**

- A. The CONTRACTOR shall handle hazardous waste and materials in accordance with applicable local, state, and federal regulations. Waste shall also be disposed of in WFPA approved landfills as applicable.
- B. The CONTRACTOR shall prevent accumulation of wastes which create hazardous conditions.
- C. Burning or burying rubbish and waste materials on the site shall not be allowed.
- D. Disposal of hazardous wastes or materials into sanitary or storm sewers shall not be allowed.

##### **1.4 DISPOSAL OF SURPLUS MATERIALS**

Unless otherwise shown on the Drawings, specified or directed, the CONTRACTOR shall legally dispose of all surplus materials and equipment from demolition off the Project site, and shall provide suitable off-site disposal site, or utilize a site designated by the OWNER.

## **PART 2 PRODUCTS**

### **2.1 CLEANING MATERIALS AND EQUIPMENT**

The CONTRACTOR shall provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

### **2.2 COMPATIBILITY**

The CONTRACTOR shall use only the cleaning materials, methods and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the ENGINEER or OWNER.

## **PART 3 EXECUTION**

### **3.1 PROGRESS CLEANING**

#### **A. General**

1. The CONTRACTOR shall not allow the accumulation of scrap, debris, waste material and other items not required for construction of this Work.
2. The CONTRACTOR shall, at least once each week, and more often if necessary, completely remove all scrap, debris and waste material from the job site.
3. The CONTRACTOR shall provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the environment.

#### **B. Site**

1. Daily, and more often if necessary, the CONTRACTOR shall inspect the site and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
2. The CONTRACTOR shall restack materials stored on site weekly, or as often as necessary, in order to maintain a neat and orderly work area free of safety hazards.
3. At all times maintain the site in a neat and orderly condition which meets the approval of the ENGINEER.



C. Structures

1. Weekly, and more often if necessary, the CONTRACTOR shall inspect the structures and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
2. Weekly, and more often if necessary, the CONTRACTOR shall sweep all interior spaces clean. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by using a hand-held broom.
3. As required preparatory to installation of successive materials, the CONTRACTOR shall clean the structures or pertinent portions as recommended by the manufacturer of the successive material.
4. Following the installation of finish floor materials, the CONTRACTOR shall clean the finish floor daily. "Clean", for the purpose of this paragraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the ENGINEER, may be injurious to the finish floor material.
5. The CONTRACTOR shall schedule cleaning operation so that dust and other contaminants resulting from cleaning operations will not fall on wet, recently painted surfaces.

**3.2 FINAL CLEANING**

- A. Definitions: Unless otherwise specifically specified, "clean" for the purpose of this Article shall be interpreted as the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.
- B. General: Prior to completion of the Work, the CONTRACTOR shall remove from the job site all tools, surplus materials, equipment, scrap, debris and waste. Conduct final progress cleaning as described in 3.01 above.
- C. Site: Unless otherwise specifically directed by the ENGINEER or OWNER, the CONTRACTOR shall hose down all paved areas on the site and all public sidewalks directly adjacent to the site; rake clean other surfaces of the grounds and completely remove all resultant debris.

D. Structures

1. The CONTRACTOR shall remove all traces of soil, waste material, splashed material, and other foreign matter to provide a uniform degree of exterior cleanliness. The CONTRACTOR shall visually inspect all exterior surfaces and remove all traces of soil, waste material, and other foreign matter. The CONTRACTOR shall remove all traces of splashed materials from adjacent surfaces. If necessary to achieve a uniform degree of exterior cleanliness, the CONTRACTOR shall hose down the exterior of the structure. In the event of stubborn stains not removable with water, the ENGINEER or OWNER may require light sandblasting or other cleaning at no additional cost to the OWNER.
  2. The CONTRACTOR shall visually inspect all interior surfaces and remove all traces of soil, waste material, smudges and other foreign matter. The CONTRACTOR shall remove all paint droppings, spots, stains and dirt from finished surfaces.
  3. The CONTRACTOR shall clean all glass inside and outside.
  4. The CONTRACTOR shall polish all surfaces requiring the routine application of buffed polish and provide and apply polish as recommended by the manufacturer of the material being polished.
- E. Post-Construction Cleanup: The CONTRACTOR shall remove all evidence of temporary construction facilities, haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other evidence of construction, as directed by the ENGINEER or OWNER.
- F. Restoration of Landscape Damage: Any landscape feature damaged by the CONTRACTOR shall be restored as nearly as possible to its original condition at the CONTRACTOR'S expense. The ENGINEER and/or OWNER will decide what method of restoration shall be used.
- G. Timing: The CONTRACTOR shall schedule final cleaning as approved by the ENGINEER to enable the OWNER to accept the Project.

### **3.3 CLEANING DURING OWNER'S OCCUPANCY**

Should the OWNER occupy the Work, or any portion thereof, prior to its completion by the CONTRACTOR and acceptance by the OWNER, responsibilities for interim and final cleaning of the occupied spaces shall be as determined by the ENGINEER in accordance with the Supplementary Conditions of the Contract Documents.

END OF SECTION



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**SECTION 01720**  
**Record Documents**

**PART 1 GENERAL**

**1.1 SCOPE**

- A. The work under this Section includes, but is not necessarily limited to, the compiling, maintaining, recording and submitting of project record documents as herein specified.
- B. Record documents include, but are not limited to:
  - 1. Drawings;
  - 2. Specifications;
  - 3. Change orders and other modifications to the Contract;
  - 4. ENGINEER field orders or written instructions, including Requests for Information (RFI) and Clarification Memorandums;
  - 5. Reviewed shop drawings, product data and samples;
  - 6. Test records.
- C. The CONTRACTOR shall maintain on the Project site throughout the Contract Time an up to date set of Record Drawings.

**1.2 MAINTENANCE OF DOCUMENTS AND SAMPLES**

- A. Storage
  - 1. The CONTRACTOR shall store documents and samples in the CONTRACTOR'S field office, apart from documents used for construction.
  - 2. The CONTRACTOR shall provide files and racks for storage of documents.
  - 3. The CONTRACTOR shall provide locked cabinet or secure storage space for storage of samples.

- B. The CONTRACTOR shall file documents and samples in accordance with format of these Specifications.
- C. Maintenance
  - 1. The CONTRACTOR shall maintain documents in a clean, dry, legible condition and in good order.
  - 2. The CONTRACTOR shall not use record documents for construction purposes.
  - 3. The CONTRACTOR shall maintain, at the site for the OWNER, one copy of all record documents.
- D. The CONTRACTOR shall make documents and samples available at all times for inspection by ENGINEER or OWNER.
- E. Failure to maintain the Record Documents in a satisfactory manner may be cause for withholding of a CONTRACTOR's request for payment.

### **1.3 QUALITY ASSURANCE**

- A. Unless noted otherwise, Record Drawings shall provide dimensions, distances and coordinates to the nearest 0.1 foot.
- B. Unless noted otherwise, Record Drawings shall provide elevations to the nearest 0.01 foot for all pertinent items constructed by the CONTRACTOR.

### **1.4 RECORDING**

- A. The CONTRACTOR shall label each document "PROJECT RECORD" in neat, large printed letters.
- B. Recording
  - 1. The CONTRACTOR shall record information concurrently with construction progress.
  - 2. Then CONTRACTOR shall not backfill or otherwise conceal any work until required information is recorded.

## 1.5 RECORD DRAWINGS

- A. Record Drawings shall be reproducible, shall have a title block indicating that the drawings are Record Drawings, the name of the company preparing the Record Drawings, and the date the Record Drawings were prepared. The CONTRACTOR will be provided paper copies of the Drawings, or the CONTRACTOR may elect to provide reproducible drawings via another method approved by the ENGINEER. Reproducible shall be defined as allowing a clear copy to be reproduced on a standard office copier, or in an electronic format printable with standard office equipment.
- B. The CONTRACTOR shall legibly mark drawings to record actual construction, including:
  - 1. All Construction
    - a. Changes of dimension and detail.
    - b. Changes made by Requests for Information (RFI), field order, clarification memorandums or by Change Order.
    - c. Details not on original Drawings.
  - 2. Site Improvements, Including Underground Utilities
    - a. Horizontal and vertical locations of all exposed and underground utilities and appurtenances, both new facilities constructed and those utilities encountered, referenced to permanent surface improvements.
    - b. Location of and dimensions of roadways and parking areas, providing dimensions to back of curb when present.
    - c. The locations shall be referenced to at least two easily identifiable, permanent landmarks or benchmarks.
    - d. The Record Drawings shall include the horizontal angle and distance between manhole covers.
  - 3. Structures
    - a. Depths of various elements of foundation in relation to finish first floor datum or top of wall.

- b. Location of internal and buried utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

## **1.6 SPECIFICATIONS**

- A. The CONTRACTOR shall legibly mark each section to record:
  - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  - 2. Changes made by Requests for Information (RFI), field order, clarification memorandums, or by Change Order.

## **1.7 SUBMITTAL**

- A. At contract closeout, the CONTRACTOR shall deliver Record Documents to the ENGINEER.
- B. The CONTRACTOR shall accompany submittal with transmittal letter, in duplicate, containing:
  - 1. Date
  - 2. Project title and number
  - 3. CONTRACTOR'S name and address
  - 4. Title and number of each record document
  - 5. Signature of CONTRACTOR or CONTRACTOR'S authorized representative

END OF SECTION



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## SECTION 01740

### Warranties and Bonds

#### PART 1 GENERAL

##### 1.1 PROJECT MAINTENANCE AND WARRANTY

- A. The CONTRACTOR shall maintain and keep in good repair the Work covered by these Drawings and Specifications until acceptance by the OWNER.
- B. The CONTRACTOR shall warrant for a period of one (1) calendar year from the date of OWNER'S written acceptance of certain segments of the Work and/or OWNER'S written final acceptance of the Project, as defined in the Contract Documents, that the completed Work is free from all defects due to faulty products or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. **The Performance Bond shall remain in full force and effect throughout the warranty period.**
- C. The CONTRACTOR shall not be obligated to make replacements which become necessary because of ordinary wear and tear, or as a result of improper operation or maintenance by the OWNER, or as a result of improper work or damage by another contractor or the OWNER, or to perform any work which is normally performed by a maintenance crew during operation.
- D. In the event of multiple failures of major consequences prior to the expiration of the one year warranty described above, the affected unit shall be disassembled, inspected and modified or replaced as necessary to prevent further occurrences at no cost to the OWNER. All related components which may have been damaged or rendered non-serviceable as a consequence of the failure shall be replaced at no cost to the OWNER. A new 12 month warranty against defective or deficient design, workmanship, and materials shall commence on the day that the item is reassembled and placed back into satisfactory operation and/or successfully started up by a manufacturer's representative. As used herein, multiple failure shall be interpreted to mean two or more successive failures of the same kind in the same item or failures of the same kind in two or more items. Major failures may include, but are not limited to, cracked or broken housings, piping, or vessels, excessive deflections, bent or broken shafts, broken or chipped gear teeth, premature bearing failure, excessive wear or excessive leakage around seals.

Failures which are directly and clearly traceable to operator abuse, such as operations in conflict with published operating procedures or improper maintenance, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over-or under-lubrication and using maintenance procedures not conforming with published maintenance instructions, shall be exempted from the scope of the one year warranty. Should multiple failures occur in a given item, all products of the same size and type shall be disassembled, inspected, modified or replaced as necessary and re-warranted for one year at no cost to the OWNER.

- E. The CONTRACTOR shall, at CONTRACTOR'S own expense, furnish all labor, materials, tools and equipment required and shall make such repairs and removals and shall perform such work or reconstruction as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship or faulty materials, in any part of the Work performed by the CONTRACTOR. Such repair shall also include refilling of trenches, excavations or embankments which show settlement or erosion after backfilling or placement.
- F. Except as noted on the Drawings or as specified, all structures such as embankments and fences shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility not designated for removal, resulting from the CONTRACTOR'S operations, shall be promptly repaired by the CONTRACTOR at no cost to the OWNER.
- G. The CONTRACTOR shall be responsible for all road and entrance reconstruction and repairs and maintenance of same for a period of one year from the date of written final acceptance by the OWNER. In the event the repairs and maintenance are not made immediately and it becomes necessary for the owner of the road or driveway to make such repairs, the CONTRACTOR shall reimburse the owner of the road for the cost of such repairs.
- H. In the event the CONTRACTOR fails to proceed to remedy the defects upon notification within fifteen (15) days of the date of such notice, the OWNER reserves the right to cause the required materials to be procured and the work to be done, as described in the Drawings and Specifications, and to hold the CONTRACTOR and the sureties on CONTRACTOR'S bond liable for the cost and expense thereof.
- I. Notice to CONTRACTOR for repairs and reconstruction will be made in the form of a registered letter addressed to the CONTRACTOR at CONTRACTOR'S home office.

- J. Neither the foregoing paragraphs nor any provision in the Contract Documents, nor any special guarantee time limit implies any limitation of the CONTRACTOR'S liability within the law of the place of construction.

END OF SECTION



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**SECTION 02010**  
**Subsurface Conditions**

**PART 1 GENERAL**

**1.1 DESCRIPTION**

- A. Investigation: The CONTRACTOR shall visit the site and become acquainted with site conditions. Prior to bidding, prospective CONTRACTORS shall make their own site and subsurface investigations to satisfy themselves with site and subsurface conditions. The CONTRACTOR shall be responsible for obtaining rights of ingress and egress to private property for site and subsurface investigation and shall assume all responsibility for any damage to property caused as a result of the CONTRACTOR'S investigation.
  
- B. A geotechnical investigation has been performed for this Contract. The CONTRACTOR is responsible for making their own determination of subsurface conditions, based upon their own interpretation of the geotechnical report found in the Appendices.
  
- C. The CONTRACTOR shall be responsible for retaining a qualified, independent third party geotechnical engineer to review and verify the subsurface conditions at the required depth of excavation for the foundations for compliance with the recommendations of the geotechnical report. It is recommended, though not required, that the CONTRACTOR retain the same consultant who authored the geotechnical report for this service.

END OF SECTION



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**SECTION 02140**  
**Dewatering**

**PART 1 GENERAL**

**1.1 SCOPE**

- A. This Section shall apply to all excavation, except trench excavation.
- B. Construct all permanent work in areas free from water. Design, construct and maintain all dikes, levees, cofferdams and diversion and drainage channels as necessary to maintain the areas free from water and to protect the areas to be occupied by permanent work from water damage. Remove temporary works after they have served their purpose.
- C. The CONTRACTOR shall be responsible for the stability of all temporary and permanent slopes, grades, foundations, materials and structures during the course of the Contract. Repair and replace all slopes, grades, foundations, materials and structures damaged by water, both surface and subsurface, to the lines, grades and conditions existing prior to the damage, at no additional cost to the OWNER.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

**3.1 CARE OF WATER**

- A. Except where the excavated materials are designated as materials for permanent work, material from required excavation may be used for dikes, levees, cofferdams and other temporary backfill.
- B. Furnish, install, maintain and operate necessary pumping and other equipment for dewatering the various parts of the work and for maintaining the foundation and other parts free from water as required for constructing each part of the work.
- C. Install all drainage ditches, sumps and pumps to control excessive seepage on excavated slopes, to drain isolated zones with perched water tables and to drain impervious surfaces at final excavation elevation.

- D. Dewater by means which will insure dry excavations, preserve final lines and grades, do not disturb or displace adjacent soil.
- E. All pumping and drainage shall be done with no damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic or the work of other contractors, and in accordance with all pertinent laws, ordinances and regulations.
- F. Do not overload or obstruct existing drainage facilities.
- G. After they have served their purpose, remove all temporary protective work at a satisfactory time and in a satisfactory manner. All diversion channels and other temporary excavations in areas where the compacted fill or other structures will be constructed shall be cleaned out, backfilled and processed under the same Specifications as those governing the compacted fill.
- H. When the temporary works will not adversely affect any item of permanent work or the planned usage of the Project, the CONTRACTOR may be permitted to leave such temporary works in place. In such instances, breaching of dikes, levees and cofferdams may be required.

### **3.2 DEWATERING**

- A. By the use of well points, pumps, tile drains or other approved methods, the CONTRACTOR shall prevent the accumulation of water in excavated areas. Should water accumulate, it shall be promptly removed.
- B. Excavations shall be continuously dewatered to maintain a ground water level no higher than three to four feet below the lowest point in the excavation. Dewatering shall be accomplished well enough in advance of excavation to ensure that groundwater is already lowered prior to completing the final excavation to finish subgrade.
- C. All destabilized subgrade conditions caused by inadequate or untimely dewatering operations shall be undercut and backfilled with suitable backfill material at no additional cost to the OWNER.
- D. Piezometric observation wells are required to monitor the ground water level to insure proper dewatering prior to excavation below the static water table. The number of wells required will vary depending on the size and depth of structures.

END OF SECTION



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## SECTION 02200

### Earthwork

#### **PART 1 GENERAL**

##### **1.1 DESCRIPTION OF WORK**

- A. Extent of earthwork is indicated on the Drawings.
  - 1. Preparation of subgrade for tanks, basins, building slabs, walks, and pavements is included as part of this work.
  - 2. Engineered fill course for support of building or basin slabs is included as part of this work.
  - 3. Backfilling of tanks, basins, basements, and trenches within building lines is included as part of this work.
- B. Excavation for Mechanical/Electrical Work: Excavation and backfill required in conjunction with underground mechanical and electrical utilities, and buried mechanical and electrical appurtenances is included as work of this Section.
- C. Definition: "Excavation" consists of removal of all material encountered to subgrade elevations indicated or required and subsequent disposal of materials removed. All Excavation is unclassified. There shall be no additional compensation to the CONTRACTOR for rock excavation.

##### **1.2 QUALITY ASSURANCE**

- A. Codes and Standards: Perform excavation work in compliance with applicable requirements of any governing authorities having jurisdiction.
- B. Testing and Inspection Services: Employ, at CONTRACTOR'S expense, an independent third party testing laboratory acceptable to the OWNER to perform soil testing and inspection service for quality control testing during earthwork operations.

##### **1.3 SUBMITTALS**

- A. Test Reports-Excavating

Submit following reports directly to the ENGINEER from the testing services, with copy to CONTRACTOR and OWNER:

- 1. Test reports on borrow material.

2. Verification of each footing subgrade.
3. Field density test reports.
4. One optimum moisture-maximum density curve for each type of soil encountered.
5. Report of actual unconfined compressive strength and/or results of bearing tests on each strata tested.

#### **1.4 JOB CONDITIONS**

##### **A. Site Information**

1. Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that OWNER will not be responsible for interpretation or conclusions drawn therefrom by CONTRACTOR. Data are made available for convenience of CONTRACTOR.
2. Additional test borings and other exploratory operations may be made by CONTRACTOR at no cost to OWNER. Any additional testing or verification of site/subsurface conditions shall be by the CONTRACTOR and at no additional cost to the OWNER or ENGINEER.

##### **B. Existing Utilities:** Prior to commencement of work, the CONTRACTOR shall locate existing underground utilities in areas of the work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

##### **C. Use of Explosives:** The CONTRACTOR (or any of his subcontractors) shall not bring explosives onto site or use in work without prior written permission from the OWNER. All activities involving explosives shall be in compliance with the rules and regulations of the Kentucky Department of Mines and Minerals, Division of Explosives and Blasting and any other Governing Authorities having Jurisdiction. CONTRACTOR is solely responsible for handling, storage, and use of explosive materials when their use is permitted.

1. The CONTRACTOR shall not be permitted to utilize any explosives prior to submitting an acceptable Pre-Blast Survey to the ENGINEER and OWNER of any structures within 500 feet of any proposed blast. Pre-Blast Survey shall be conducted by a qualified and approved independent third party at the expense of the CONTRACTOR

- D. Protection of Persons and Property
  - 1. Barricade open excavations occurring as part of this work and post with warning lights.
    - a. Operate warning lights as recommended by authorities having jurisdiction.
    - b. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
    - c. There shall be no pipeline ditches left open overnight. The CONTRACTOR is solely responsible for project site safety.

## **PART 2 PRODUCTS**

### **2.1 SOIL MATERIALS**

- A. Definitions
  - 1. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, SP, GC, SC, ML and CL.
  - 2. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups MH, CH, OL, OH and PT.
  - 3. Subbase Material: Naturally and artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.
  - 4. Drainage fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 4 sieve.
  - 5. Backfill and fill materials: Satisfactory soil materials free of debris, waste, frozen materials, vegetable, and other deleterious matter.
  - 6. Engineered fill: (Refer to this Section, paragraph 3.7 A.1.)

## **PART 3 EXECUTION**

### **3.1 STRIPPING AND TOPSOILING**

- A. Before excavation and grading is commenced for buildings, structures or other work described hereinafter (except pipelines and manholes), the material meeting the topsoil specification of these Specifications shall be removed from the areas affected and stock-piled. When final grading is accomplished, particularly around buildings and other structures, the topsoil shall be spread evenly over the excavated area. Rough grading above excavated areas shall have been carried approximately 6 inches below finished grade (except solid rock, where it shall be carried 12 inches below finished grade) and brought back up to grade with topsoil as set out herein.

### **3.2 EXCAVATION**

- A. Excavation includes excavation to subgrade elevations indicated including excavation of earth, rock, bricks, wood, cinders, and other debris. All excavation of materials in the lump sum portion of the work will be unclassified and no additional payment will be made regardless of type material encountered.
- B. Excavation Classifications (Not Used)
- C. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of ENGINEER. Unauthorized excavation, as well as remedial work directed by ENGINEER, shall be at CONTRACTOR'S expense.
  - 1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to the ENGINEER.
  - 2. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classifications.
- D. Additional Excavation
  - 1. When excavation has reached required subgrade elevations, notify the ENGINEER who will make an inspection of conditions.
    - a. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed in writing by the ENGINEER.

- b. Removal of unsuitable material and its replacement as directed will be paid on basis of Contract conditions relative to changes in work.

E. Stability of Excavations

1. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
2. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

F. Shoring and Bracing

1. The CONTRACTOR shall provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross-braces, in good serviceable condition.
  - a. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
  - b. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
  - c. Provide permanent steel sheet piling or pressure creosoted timber sheet piling wherever subsequent removal of sheet piling might permit lateral movement of soil under adjacent structures. Cut off tops as required and leave permanently in place. In the event the OWNER directs the CONTRACTOR to leave shoring materials in place, the OWNER will reimburse the CONTRACTOR for the reasonable cost of leaving such materials in place.

G. Dewatering: Refer to this Division, Section 02140 for dewatering requirements, if applicable.

H. Material Storage

1. Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.
  - a. Dispose of excess soil material and waste materials as herein specified.

I. Excavation for Structures

1. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
2. In excavating for footings and foundations, take care not to disturb bottom of excavation. All loose material shall be removed from the excavation just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

J. Excavation for Pavements

1. Cut surface under pavements to comply with cross-sections, elevations, and grades as shown.

K. Trench Excavation

1. The CONTRACTOR shall include in his lump sum bid all trenching and backfill necessary for installation of all pipelines as planned and specified. Trenching shall include clearing and grubbing of all trash, weeds, briars, trees, stumps encountered in trenching. The CONTRACTOR shall dispose of such material at no extra cost to the OWNER. Shrubs shall be removed, maintained and replanted in the same or adjacent location as the ENGINEER or owner may direct. Trenching also includes such items as railroad, street, road, sidewalk, pipe, and small creek crossings; cutting, moving or repairing damage to fences, posts, gates, and other surface structures regardless of whether shown on the Drawings.
2. All existing facilities shall be protected from danger or damage while pipelines are being constructed and backfilled, and from damage due to settlement of the backfill.
3. In the event any existing structure is damaged, repair and restoration shall be made at once and backfill shall not be replaced until this is done. Restoration and repair shall be such that the damaged structure is equal to or better than its original condition and can serve its purpose as completely as before, per the interpretation of the ENGINEER and/or OWNER. All such restoration and repair shall be done without extra cost to the OWNER.

4. Trenches must be dug to lines and grades shown on the Drawings. Hand trenching may be required in areas where machine trenching would result in undue damage to existing structures and facilities.
5. Excavation shall be open trenches, except where otherwise shown on the Drawings, for tunneling, boring, or jacking under structures, railroad, sidewalks and roads.
6. Sheeting and shoring of trenches shall be provided at the expense of the CONTRACTOR where necessary to protect life, property and the new or existing structures from damage or to maintain maximum permissible trench widths at top of pipe. All necessary materials, including, but not limited to, sheeting, sheet piling, trench jacks, braces, shores and stringers, shall be used to hold trench walls. Sheeting and shoring may be withdrawn as the trenches are being backfilled, after backfill has been tamped over top of the pipe at least 18 inches. If removal before backfill is completed to surface endangers adjacent structures, such as buildings, pipelines, street paving, and sidewalks, then the sheeting and shoring shall be left in place until such danger has passed, and then pulled if practical. Voids caused by sheeting withdrawal shall be backfilled and tamped. If not withdrawn, sheeting shall be cut off at least 18 inches below final surface grade, so there is no obstruction at the ground level. In the event the OWNER directs the CONTRACTOR to leave shoring materials in place, the OWNER will reimburse the CONTRACTOR for the reasonable cost of leaving such materials in place.
7. Where subgrade of trench has insufficient stability to support the pipeline and hold it to its original grade, the ENGINEER may order stabilization by various means. Exclusive of dewatering normally required for construction, and instability caused by neglect of the CONTRACTOR, the necessary stabilization shall be paid for at unit prices established in the Contract. In the event no particular bid price is applicable, then the payment for stabilization will be negotiated.
8. The location of the pipelines and their appurtenances as shown are those intended for the final construction. However, conditions may present themselves before construction on any line is started that would indicate desirable changes in location. The OWNER reserves the right to make reasonable changes in line and structure locations without extra cost, except as may be determined by extra units of materials and construction actually involved. The OWNER is under no obligation to locate pipelines so they may be excavated by machine or otherwise for the convenience of the CONTRACTOR.

9. Tunneling may be used at the CONTRACTOR'S option as an alternate to open-cut trenching, at no extra cost to the OWNER. The annular space between plates and excavation shall be either permanently placed pea gravel or sand, pumped grout (3 parts sand and 1 part Portland cement by volume) or other suitably installed material approved by the ENGINEER. Backfilling shall be kept close to the heading and completed after each day's work. Where grout is used for backfill, injection holes with threaded plugs shall be provided in linear plates at various levels and in sufficient number of effectively grout to void around the tunnel. A minimum of 3 grout holes shall be provided in each 8 feet of tunnel length. Grout shall be injected in the lower holes first, proceeding upward as the void is filled. Plugs shall be installed after each hole is filled and grout stops shall be provided behind plates as necessary to ensure complete filling of the void. In tunneling under buildings, the CONTRACTOR will be responsible for all damage resulting from his operations and methods of excavation and backfilling. Boring may also be used at the CONTRACTOR'S option as an alternate to tunneling or open-cut trenching, at no extra cost to the OWNER.
  
10. Dig trenches to the uniform width required for the particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit.
  - a. Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations. Beyond building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze-ups.
  
  - b. Where rock is encountered, carry excavation 6 inches below required elevation and backfill with a 6-inch layer of crushed stone or gravel prior to installation of pipe.
  
  - c. For pipes or conduit 3 inches or less in nominal size and for flat-bottomed, multiple-duct conduit units, excavate to subbase depth indicated or, if not indicated, then to 4 inches below bottom of work to be supported.
  
  - d. For pipes or conduit 6 inches or larger in nominal size, tanks, and other mechanical/electrical work indicated to receive subbase, excavate to subbase depth indicated or, if not otherwise indicated, to 6 inches below bottom of work to be supported.
  
  - e. Except as otherwise indicated, excavation for exterior water-bearing piping (water, steam, condensate, drainage) so top of piping is no less than 3 feet 0 inches below finish grade.



- f. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
  - g. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and which are carried below bottom of such footings, or which pass under wall footings. Place concrete to level of bottom of adjacent footing.
  - h. Concrete is specified in Division 3.
  - i. Do not backfill trenches until tests and inspections have been made and backfilling authorized by the ENGINEER or OWNER. Use care in backfilling to avoid damage or displacement of pipe systems.
  - j. For piping or conduit less than 3 feet 0 inches below surface of roadways, furnish and install steel casing pipe, minimum wall thickness of 1/4", of sufficient diameter to carry the pipe or conduit and spacers to at least two feet beyond outside edge of pavement or as required by Governing Authorities (typically not less than Ditchline to Ditchline).
- L. Cold Weather Protection
- 1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F (1°C).

### **3.3 COMPACTION**

- A. General
- 1. Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
    - a. Percentage of maximum density requirements: Compact soil to not less than the following percentages of maximum density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D698 and not less than the following percentages of relative density, determined in accordance ASTM D4253 and D4254, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils).

- b. Structures, building slabs and steps, pavements: Compact top 12 inches of subgrade and each layer of backfill or fill material at 95 percent standard proctor density.
- c. Lawn or unpaved areas: Compact top 6 inches of subgrade and each layer of backfill or fill material at 90 percent standard proctor density.
- d. Walkways: Compact top 6 inches of subgrade and each layer of backfill or fill material at 95 percent standard proctor density.

B. Moisture Control

- 1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface or subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
- 2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
- 3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

### 3.4 BACKFILL AND FILL

A. General

- 1. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below. Backfill material shall be no larger than the specified depth of the layer to be placed and/or compacted.
  - a. In excavations, use satisfactory excavated or borrow material.
  - b. Under grassed areas, use satisfactory excavated or borrow material.
  - c. Under walks and pavements, use subbase material, or satisfactory excavated or borrow material, or combination of both.
  - d. Under steps, use subbase material.

- e. Under building slabs, use subbase material for a minimum depth of 6 inches.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
1. Acceptance of construction below finish grade including, where applicable, damproofing, waterproofing, and perimeter insulation.
  2. Inspection, testing, approval, and recording locations of underground utilities.
  3. Removal of concrete formwork.
  4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
  5. Removal of trash and debris.
  6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
- C. Ground Surface Preparation
1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
  2. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- D. Placement and Compaction
1. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Crushed stone shall be installed in accordance with Section 02255.

- a. Before compaction, add moisture or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
- b. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.

E. Backfilling Trenches

1. Backfilling shall be accomplished as soon as practical after pipe has been laid and jointing and alignment approved and after the OWNER or ENGINEER has observed the work. Packing of crushed rock between joints shall be the usual procedure as the laying progresses. This is in order to avoid danger of misalignment from slides, flooding or other causes. Any work backfilled prior to acceptance by the OWNER or ENGINEER is at the CONTRACTOR'S risk. Upon Request, the CONTRACTOR shall uncover any such work for inspection at no cost to the OWNER or ENGINEER.
2. Any special requirements of a Railroad Company or Highway Department in regard to backfilling will take precedence over the following general Specifications.
3. The backfill over the pipe shall be in accordance with the standard details shown on the Drawings for bedding and backfilling pipe and any other applicable sections of the Contract Documents.
4. In case maximum permissible trench widths (as designated by the pipe manufacturer) are exceeded, the CONTRACTOR shall furnish crushed rock backfill to a minimum of 12 inches over the top of pipe at no extra cost to the OWNER.
5. After the foregoing cover requirements over top of the pipe have been met, rock may be used in the backfill in pieces no larger than 2 inches in any dimension. If additional earth is required for backfilling, it must be obtained and placed by the CONTRACTOR at no cost to the OWNER. Filling with rock and earth shall proceed simultaneously, such that no voids are left in the backfill. After cover requirements over top of pipe have been met, backfilling may be employed without tamping, provided

caution is used in quantity per dump and uniformity of level of backfilling. Surplus material shall be uniformly ridged over trench and excess rock hauled away, with no rock over 1-1/2 inch diameter in the top 6 inches. Ridged backfill shall be confined to the width of the trench and no higher than needed for replacement of settlement of backfill.

6. In the case of street, highway, railroad, sidewalk and driveway crossings; or within any roadway paving; or about manholes, valve and meter boxes; the backfill must be mechanically tamped in not over 6 inch layers, measured loose. Alternate method of compacting backfill shall be used, if refill material is in large hard lumps (crushed rock excepted) which cannot be consolidated without leaving voids.
7. In the case of tunnels, the annular space between plates and excavation shall be either permanently placed pea gravel or sand, pump grout (3 parts sand and 1 part Portland cement by volume) or other suitably installed material approved by the ENGINEER. Backfilling shall be kept close to the heading and completed after each day's work. Where grout is used for backfill, injection holes with threaded plugs shall be provided in liner plates at various levels and in sufficient number to effectively grout the void around the tunnel. A minimum of 3 grout holes shall be provided in each 8 feet of tunnel length. Grout shall be injected in the lower holes first, proceeding upward as the void is filled. Plugs shall be installed after each hole is filled and grout stops shall be provided behind plates as necessary to ensure complete filling of the void.
8. Where traffic on streets, driveways, railroads, sidewalks and highways requires temporary surfacing, backfilling shall be terminated 4 inches below original ground level and 4 inches to 6 inches of dense graded aggregate shall be placed on the trench. Backfills shall be maintained easily passible to traffic at original ground level, until acceptance of project or replacement of paving or sidewalks.
9. The CONTRACTOR shall protect all sewer, gas, electric, telephone, water and drain pipes or conduits from damage while pipelines are being constructed and backfilled, and from danger due to settlement of trench backfill. Any repairs required as a result of Project Construction Activities by the CONTRACTOR shall be accomplished by the CONTRACTOR at no cost to the OWNER or ENGINEER.
10. No extra payment shall be made for backfilling of any kind, except as specified hereinbefore. Backfilling shall be included as a part of the lump sum bid. No extra payment will be made to the CONTRACTOR for supplying outside materials for backfill.

11. On completion of the project, all backfills shall be dressed; holes filled; and surplus material hauled away. All permanent walks, street paving, roadway, etc., shall be restored and seeding and sodding performed as required. The CONTRACTOR shall return to the Project Site at any time within the Warranty Period to address any deficiencies in the above work at no cost to the OWNER.

### **3.5 GRADING**

#### **A. General**

1. Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.

#### **B. Grading Outside Building Lines**

1. All materials used for backfill around structures shall be of a quality acceptable to the ENGINEER and shall be free from large or frozen lumps, wood and other extraneous material. All spaces excavated and not occupied by footings, foundation walls or other permanent work shall be refilled with earth up to the surface of the surrounding ground, unless otherwise specified, with sufficient allowance for settlement. In making the fills and terraces around the structures, the fill shall be placed in layers not exceeding 12 inches in depth and shall be kept smooth as the work progresses. Each layer of the fill shall be rolled with an approved type roller and/or be compacted. When it is not practicable to compact sections of the fill immediately adjacent to buildings or structures by rolling, then such section shall be thoroughly compacted by means of mechanical tamping or hand tamping as may be required by the conditions encountered. All fills shall be placed so as to load structures symmetrically.
2. As set out hereinbefore, rough grading shall be held below finished grade and then the topsoil which has been stockpiled shall be evenly spread over the surface. The grading shall be brought to the levels shown on the Drawings or to the elevations established by the ENGINEER. Final dressing shall be accomplished by hand work or machine work, or a combination of these methods as may be necessary to produce a uniform and smooth finish to all parts of the regrade. The surface shall be free from clods greater than 2 inches in diameter. Excavated rock may be

placed in the fills, but it shall be thoroughly covered. Rock placed in fills shall not be closer than 12 inches from finished grade.

3. Grade areas adjacent to building lines to drain away from structures and to prevent ponding.
  - a. Finish surfaces free from irregular surface changes, and as follows:
    - (1) Lawn or unpaved areas: Finish areas to receive topsoil to within not more than 0.10 ft. above or below required subgrade elevations.
    - (2) Walks: Shape surface of areas under walks to line, grade, and cross-section, with finish surface not more than 0.0 inch above or 1.0 inch below required subgrade elevation.
    - (3) Pavements: Shape surface of areas under pavement to line, grade, and cross-section, with finish surface not more than 0.0 inch above or 1 inch below required subgrade elevation.
  - C. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 0.0 inch above or 1 inch below required subgrade elevation when tested with a 10 ft. straightedge.
  - D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or standard proctor density for each area classification.

### **3.6 PAVEMENT SUBBASE COURSE**

- A. General
  1. Subbase course consists of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course.
  2. See other Division 2 sections for paving specifications. In ALL cases requirements of Applicable Governing Authorities shall be met by the CONTRACTOR.

- B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.
- C. Shoulders
  - 1. Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12 inch width of shoulder simultaneously with compacting and rolling of each layer of subbase course.
- D. Placing
  - 1. Place subbase course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.
  - 2. When a compacted subbase course is shown to be 6 inches thick or less, place material in a single layer. When shown to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.

### **3.7 BUILDING SLAB ENGINEERED FILL COURSE**

- A. General
  - 1. Engineered fill course consists of placement of crushed stone, size and type shown on drawings, in layers of indicated thickness, over subgrade surface to support concrete building slabs.
- B. Placing
  - 1. Place fill material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.
  - 2. When a compacted course is shown to be 6 inches or less, place material in a single layer. When shown to be more than 6 inches thick, place material in equal layers, except no single layer shall be more than 6 inches or less than 3 inches in thickness when compacted.



### **3.8 FIELD QUALITY CONTROL**

- A. Quality Control Testing During Construction
  - 1. Allow testing service to inspect and report to the ENGINEER on findings and approve subgrades and fill layers before further construction work is performed.
    - a. Perform field density tests in accordance with ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2992 (nuclear density method), as applicable.
    - b. Footing subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to ENGINEER.
    - c. Paved areas and building slab subgrade: Make at least one field density test of subgrade for every 2,000 square feet of paved area or building slab, but in no case less than three tests. In each compacted fill layer, make one field density test for every 2,000 square feet of overlaying building slab or paved area, but in no case less than three tests.
    - d. Foundation wall backfill: Take at least two field density tests, at locations and elevations as directed.
- B. If in opinion of the ENGINEER, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

### **3.9 MAINTENANCE**

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

END OF SECTION

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**SECTION 02255**

**Crushed Stone and Dense Graded Aggregate**

**PART 1 GENERAL**

**1.1 SCOPE**

- A. CONTRACTOR shall furnish and install crushed stone for miscellaneous uses as shown on the Drawings, as called for in the Specifications.
- B. Sizes, types, and quality of crushed stone are specified in this Section, but its use for replacement of unsuitable material, pavement base, and similar uses is specified in detail elsewhere in the Specifications. The ENGINEER may order the use of crushed stone for purposes other than those specified in other sections, if, in his opinion, such use is advisable. Payment for same will be subject to negotiation.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. When referred to in these Specifications, crushed stone shall be Number 57 graded in accordance with the Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction, Latest Edition, unless otherwise noted.
- B. When referred to in these Specifications, dense graded aggregate (DGA) shall be crushed stone classified by the Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction, Latest Edition, and conforming to the following requirements:

<u>Sieve Size</u>	<u>Percent Passing</u>
1 inch	100
3/4 inch	70-100
3/8 inch	50-80
#4	35-65
#10	25-50
#40	15-30
#200	5-12

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Crushed stone shall be placed in uniform layers not greater than 6 inches deep and shaped by power equipment to required lines, grades, cross sections, and depths. No minimum compacted density, method of compaction, or compaction equipment is required since a nominal amount of compaction effort with vibration can establish the desired intergranular locking of the aggregate under controlled placement depth. Acceptable compaction can be achieved with pneumatic-tired and tracked equipment and rollers.
- B. All compaction operation shall be performed to the satisfaction of the ENGINEER.
- C. Crushed stone shall be placed in those areas as shown on the Drawings, as may be directed by the ENGINEER and as required by the Contract Documents.

END OF SECTION

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**SECTION 02513**  
**Bituminous Concrete Paving**

**PART 1 GENERAL**

**1.1 GENERAL**

A. RELATED DOCUMENTS

1. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. DESCRIPTION OF WORK

1. Extent of bituminous concrete paving work is shown on drawings and described in the Contract Documents
2. Prepared aggregate subbase is specified in earthwork sections.

C. SUBMITTALS

1. Material Certificates: Provide copies of materials certificates signed by material producer and CONTRACTOR, certifying that each material item complies with, or exceed, specified requirements.

D. QUALITY ASSURANCE

1. Codes and Standards: Comply with Kentucky Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, and with local governing regulations if more stringent than herein specified.

E. SITE CONDITIONS

1. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 deg. F (10 deg. C), and when temperature has not been below 35 deg. F (1 deg. C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

2. Construct asphalt concrete surface course when atmospheric temperature is above 40 deg. F (4 deg. C), and when base is dry. Base course may be placed when air temperature is above 30 deg. F (-1 deg. C) and rising.
3. Grade Control: Establish and maintain required lines and elevations.

## 1.2 PRODUCTS

### A. MATERIALS

1. General: Use locally available material and gradations which exhibit a satisfactory record of previous installations.
2. Base Course Aggregate: Sound, angular crushed stone, crushed gravel, or crushed slag, sand, stone or slag screenings.
3. Surface Course Aggregate: Crushed stone, crushed gravel, crushed slag, and sharp-edged natural sand.
4. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with AASHTO M 17 (ASTM D 242).
5. Asphalt Cement: AASHTO M 226 (ASTM D 3381) for viscosity-graded material.
6. Prime Coat: Cut-back asphalt type; AASHTO M 82 (ASTM D 2027) MC-30, MC-70 or MC-250.
7. Tack Coat: Emulsified asphalt; AASHTO M 140 (ASTM D 977) or M 208 (D 2397); SS-1, SS-1h, CSS-1 or CSS-1h, diluted with one part water to one part emulsified asphalt.
8. Lane Marking Paint: Chlorinated rubber-alkyd type, AASHTO M 248 (FS TT-P-115), Type III.

### B. ASPHALT-AGGREGATE MIXTURE

1. Provide plant-mixed, hot-laid asphalt-aggregate mixture complying with Kentucky State Specification Section 400.

### 1.3 EXECUTION

#### A. SURFACE PREPARATION

1. Remove loose material from compacted subbase surface immediately before applying prime coat.
2. Proof roll prepared subbase surface to check for unstable areas and areas requiring additional compaction.
3. Notify CONTRACTOR of unsatisfactory conditions. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.
4. Prime Coat: Apply at rate of 0.20 to 0.50 gal. per sq. yd., over compacted subgrade. Apply material to penetrate and seal, but not flood, surface. Cure and dry as long as necessary to attain penetration and evaporation of volatile.
5. Tack Coat: Apply to contact surfaces of previously constructed asphalt or portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement. Distribute at rate of 0.05 to 0.15 gal. per sq. yd. of surface.
6. Allow to dry until at proper condition to receive paving.
7. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.

#### B. PLACING MIX

1. General: Place asphalt concrete mixture on prepared surface, spread and strike-off. Spread mixture a minimum temperature of 225 deg. F (107 deg. C). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness.
2. Paver Placing: Place in strips not less than 10' wide, unless otherwise acceptable to Architect. After first strip has been

placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before place in surface course.

3. Joints: Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.

#### C. ROLLING

1. General: Begin rolling when mixture will bear roller weight without excessive displacement.
2. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
3. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.
4. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.
5. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
6. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.
7. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
8. Erect barricades to prevent paving from traffic until mixture has cooled enough not to become marked.



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E. FIELD QUALITY CONTROL

1. General: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by ENGINEER.
2. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
  - a. Base Course: 1/2", plus or minus
  - b. Surface Course: 1/4", plus or minus
3. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straightedge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness.
  - a. Base Course Surface: 1/4"
  - b. Wearing Course Surface: 3/16"
  - c. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template, 1/4".
4. Check surface areas at intervals as directed by ENGINEER.

END OF SECTION



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**SECTION 02665**  
**Water Mains and Accessories**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. This Section describes products to be incorporated into the water mains and requirements for the installation and use of these items. Furnish all products and perform all labor necessary to fulfill the requirements of these Specifications.
- B. General: Supply all products and perform all work in accordance with applicable American Society for Testing and Material (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI), or other recognized standards. Latest revisions of all standards are applicable.

**1.02 QUALIFICATIONS**

If requested by the ENGINEER, submit evidence that manufacturers have consistently produced products of satisfactory quality and performance for a period of at least two years.

**1.03 SUBMITTALS**

Complete shop drawings and engineering data for all products shall be submitted to the ENGINEER in accordance with the requirements of Section 01340 of these Specifications.

**1.04 TRANSPORTATION AND HANDLING**

- A. Unloading: Furnish equipment and facilities for unloading, handling, distributing and storing pipe, fittings, valves and accessories. Make equipment available at all times for use in unloading. Do not drop or dump materials. Any materials dropped or dumped will be subject to rejection without additional justification. Pipe handled on skids shall not be rolled or skidded against the pipe on the ground.
- B. Handling: Handle pipe, fittings, valves and accessories carefully to prevent shock or damage. Handle pipe by rolling on skids, forklift, or front end loader. Do not use material damaged in handling. Slings, hooks or pipe tongs shall be padded

and used in such a manner as to prevent damage to the exterior coatings or internal lining of the pipe.

### **1.05 OWNER FURNISHED MATERIALS**

- A. Submit with construction progress schedule, a schedule for required deliveries of OWNER furnished Material.
- B. The CONTRACTOR shall coordinate material shipments with the OWNER and the materials suppliers.
- C. Materials furnished by the OWNER will be delivered by truck. Pipe, fittings, valves and other material to be furnished by the OWNER shall be delivered to the OWNER's storage yard or another site agreed upon by the CONTRACTOR and the OWNER. This other site, if selected, is to be provided by the CONTRACTOR at no additional cost to the OWNER.
- D. The CONTRACTOR shall maintain communication with the material suppliers, and the OWNER as necessary, to keep informed as to scheduled shipment, and upon notice to the CONTRACTOR of the delivery of materials, the CONTRACTOR shall proceed without delay to unload such materials.
- E. Upon receipt of materials from the manufacturer, the CONTRACTOR shall make an inspection of such materials, checking and certifying the bill of lading, noting any discrepancies and obtaining a proper memorandum signed by the agent of the carrier for any shortage in the shipment, or for any damaged materials received. All bills of lading and any memorandum for shortage or damage of material in the shipment shall be promptly submitted to the ENGINEER. The CONTRACTOR shall be responsible for distribution of all materials as required to complete the Work. Materials furnished to the CONTRACTOR shall be in the custody of the CONTRACTOR from the time of receipt by the CONTRACTOR of such materials from the carrier until final acceptance of the completed Work. The CONTRACTOR shall be responsible for any loss or damage to materials furnished by the OWNER.

### **1.06 STORAGE AND PROTECTION**

- A. Store all pipe which cannot be distributed along the route. CONTRACTOR shall make arrangements for the use of suitable storage areas.
- B. Stored materials shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt or foreign matter at all

times. Valves and hydrants shall be drained and stored in a manner that will protect them from damage by freezing.

- C. Pipe shall not be stacked higher than the limits recommended by the manufacturer. The bottom tier shall be kept off the ground on timbers, rails or concrete. Pipe in tiers shall be alternated: bell, plain end; bell, plain end. At least two rows of timbers shall be placed between tiers and chocks, affixed to each other in order to prevent movement. The timbers shall be large enough to prevent contact between the pipe in adjacent tiers.
- D. Stored mechanical and push-on joint gaskets shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.
- E. Mechanical-joint bolts shall be handled and stored in such a manner that will ensure proper use with respect to types and sizes.

#### **1.07 QUALITY ASSURANCE**

The manufacturer shall provide written certification to the ENGINEER that all products furnished comply with all applicable requirements of these Specifications.

### **PART 2 PRODUCTS**

#### **2.01 PIPING MATERIALS AND ACCESSORIES**

- A. Ductile Iron Pipe (DIP)
  - 1. Ductile iron pipe shall be manufactured in accordance with AWWA C151 (latest edition). All pipe, except specials, shall be furnished in nominal lengths of 18 to 20 feet. Sizes will be as shown on the Drawings. All pipe shall have a minimum pressure rating as indicated in the following table, and corresponding minimum wall thickness, unless otherwise specified or shown on the Drawings:

Pipe Sizes (inches)	Pressure Class (psi)
4 - 12	350
14 - 18	250
20	250
24	200
30 - 54	250
60 - 64	200

2. Flanged pipe minimum wall thickness shall be equal to Special Class 53. Flanges shall be furnished by the pipe manufacturer.
3. Pipe and fittings shall be cement lined in accordance with AWWA C104 (latest edition). Pipe and fittings shall be furnished with a bituminous outside coating.
4. Fittings shall be ductile iron and shall conform to AWWA C110 or AWWA C153 (latest edition) with a minimum rated working pressure of 250 psi or as indicated on plans.
5. Joints
  - a. Unless shown or specified otherwise, joints shall be push-on or restrained joint type for pipe and standard mechanical, push-on or restrained joints for fittings. Push-on and mechanical joints shall conform to AWWA C111 (latest edition). Restrained joints for pipe and fittings shall be American "FLEX-RING" or "LOK-RING", Clow "SUPER-LOCK", or U.S. Pipe "TR FLEX". No field welding of restrained joint pipe will be permitted. No mega lug type restraints are allowed on 24" and 30" water line.
  - b. Restrained joint pipe (RJP) on supports shall have bolted joints and shall be specifically designed for clear spans of at least 36 feet.
  - c. Flanged joints shall meet the requirements of ANSI B16.1, Class 125.
6. Provide the appropriate gaskets for mechanical and flange joints. Gaskets for flange joints shall be made of 1/8-inch thick, cloth reinforced rubber; gaskets may be ring type or full face type.

7. Provide the necessary bolts for mechanical, restrained and flange connections. Bolts for flange connections shall be steel with American Regular unfinished square or hexagon heads. Nuts shall be steel with American Standard Regular hexagonal dimensions, all as specified in ANSI B17.2. All bolts and all nuts shall be threaded in accordance with ANSI B1.1, Coarse Thread Series, Class 2A and 2B fit. Mechanical joint glands shall be ductile iron.
8. Acceptance will be on the basis of the ENGINEER'S inspection and the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards.

B. Polyvinyl Chloride Pipe (PVC)

1. All PVC pipe shall have belled ends for push-on type jointing and shall conform to ASTM D 2241. The pipe shall have a Standard Dimension Ratio as indicated on the plans. Pipe shall be supplied in minimum lengths of 20 feet.
2. All fittings shall be of cast or ductile iron meeting the requirements of AWWA C110 or AWWA C153 (latest edition) with a minimum rated working pressure of 250 psi. Fittings shall be cement lined in accordance with AWWA C104. Fittings shall be furnished with a bituminous outside coating. Special adapters shall be provided as recommended by the manufacturer to adapt the PVC pipe to mechanical jointing with cast or ductile iron pipe, fittings, or valves.
3. Detection tape shall be provided over all PVC water mains.
4. Acceptance will be on the basis of the ENGINEER'S or OWNER'S inspection and the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards, including the National Sanitation Foundation. Additionally, each piece of pipe shall be stamped "NSF Approved".

C. Polyvinyl Chloride Pipe (PVC) - **(C-900)**

1. All PVC pipe shall have belled ends for push-on type jointing and shall conform to AWWA C900, ductile iron pipe equivalent outside diameters. The pipe shall have a Dimension Ratio (DR) of **14** and shall be capable of

withstanding a working pressure of **200** psi. Pipe shall be supplied in minimum lengths of 20 feet.

2. All fittings shall be of cast or ductile iron meeting the requirements of AWWA C110 or AWWA C153 with a minimum rated working pressure of **250** psi. Fittings shall be cement lined in accordance with AWWA C104. Fittings shall be furnished with a bituminous outside coating. Special adapters shall be provided, as recommended by the manufacturer, to adapt the PVC pipe to mechanical jointing with cast or ductile iron pipe, fittings or valves.
3. Detection tape shall be provided over all PVC water mains.
4. Acceptance will be on the basis of the ENGINEER'S inspection and the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards, including the National Sanitation Foundation. Additionally, each piece of pipe shall be stamped "NSF Approved".

#### D. Polyethylene Pipe and Fittings

1. The CONTRACTOR shall furnish and install high density polyethylene pipe meeting these Specifications at the locations indicated on the Plans and in other sections of these Specifications.
  - a. High Density polyethylene pipe shall be manufactured and tested in conformance to the requirements of the latest revision of the American Society for Testing and Materials designation ASTM D-3350 "Polyethylene Plastic Pipe and Fittings Materials".
  - b. High density Polyethylene pipe shall have a grade designation of PE 3406 and a cell classification designation of P 355434C.
  - c. High density polyethylene pipe shall be joined by means of butt fusion.
  - d. Fittings for high density polyethylene pipe shall be manufactured of the same materials as the pipe. Unless otherwise indicated, all fittings shall be joined to the pipe by butt fusion techniques.



E. Ball and Socket River Crossing Pipe

1. Joints for ductile iron river crossing pipe shall be flexible, ball and socket type, boltless joints with rubber gaskets conforming to the ANSI specification for "Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings", A 21.11 (AWWA C11), Latest Revision.

**2.02 VALVES**

A. Gate Valves (GV)

1. 3-Inches in Diameter and Smaller: Gate valves shall be bronze, heavy duty, rising stem, wedge type with screwed or union bonnet. Valve ends shall be threaded or solder type as appropriate. Valves shall have a minimum 200 psi working pressure for water (125 psi working pressure for steam). Valves shall be made in the U.S.A. Gate valves shall be equal to Crane No. 428 (threaded) or Crane No. 1334 (solder end).
2. 4-Inches Through 12-Inches in Diameter: Gate valves 4-inches through 12-inches shall be resilient wedge type conforming to the requirements of AWWA C509 rated for 200 psi working pressure.
  - a. Valves shall be provided with two O-ring stem seals with one O-ring located above and one O-ring below the stem collar. The area between the O-rings shall be filled with lubricant to provide lubrication to the thrust collar bearing surfaces each time the valve is operated. At least one anti-friction washer shall be utilized to further minimize operating torque. All seals between valve parts, such as body and bonnet, bonnet and bonnet cover, shall be flat gaskets or O-rings.
  - b. The valve gate shall be made of cast iron having a vulcanized, synthetic rubber coating, or a seat ring attached to the disc with retaining screws. Sliding of the rubber on the seating surfaces to compress the rubber will not be allowed. The design shall be such that compression-set of the rubber shall not affect the ability of the valve to seal when pressure is applied to either side of the gate. The sealing mechanism shall provide zero leakage at the water working pressure when installed with the line flow in either direction.

- c. All internal ferrous surfaces shall be coated with epoxy to a minimum thickness of 4 mils. The epoxy shall be non-toxic, impart no taste to the water and shall conform to AWWA C550, latest revision.
- d. Gate valves 4 through 12-inches shall be manufactured by American-Darling, Mueller or M & H Valve.

#### B. Butterfly Valves (BV)

- 1. Butterfly valves shall be resilient seated, short body design, and shall be designed, manufactured, and tested in accordance with all requirements of AWWA C504, and as modified below. Valves shall be designed for a rated working pressure of 250 psi. Class B, AWWA C504 Section 5.2 testing requirements are modified as follows:
  - a. the leakage test shall be performed at a pressure of 250 psi;
  - b. the hydrostatic test shall be performed at a pressure of 500 psi; and
  - c. proof of design tests shall be performed and certification of such proof of design test shall be provided to the ENGINEER.
- 2. Valve bodies shall be ductile iron conforming to ASTM A 536, Grade 65-45-12 or ASTM A 126, Grade B cast iron. Shafts and shaft hardware shall be ASTM A 564, Type 630 stainless steel, machined and polished. Valve discs shall be ductile iron, ASTM A 536, Grade 65-45-12. The resilient valve seat shall be located either on the valve disc or in the valve body and shall be fully field adjustable and field replaceable.
- 3. Valves shall be installed with the valve shafts horizontal. Valves and actuators shall have seals on all shafts and gaskets on valve actuator covers to prevent the entry of water. Actuator mounting brackets shall be totally enclosed and shall have gasket seals.
- 4. Actuators
  - a. Valves shall be equipped with traveling nut, self-locking type actuators designed, manufactured and tested in accordance with AWWA C504. Actuators shall be capable of holding the disc in any position between full open and full closed without any movement or fluttering of the disc.

- b. Actuators shall be furnished with fully adjustable mechanical stop-limiting devices. Actuators that utilize the sides of the actuator housing to limit disc travel are unacceptable.
    - c. Valve actuators shall be capable of withstanding a minimum of 450 foot pounds of input torque in either the open or closed position without damage.
  5. Operators: Valves for buried service shall have a nut type operator and shall be equipped with a valve box and stem extension, as required.
  6. Valve ends shall be mechanical joint type, except where flanged or restrained joint ends are shown. Flange joints shall meet the requirements of ANSI B16.1, Class 125. MJ Joint ends shall be restrained were called for using American MJ coupled joint or approved equal.
  7. Butterfly valves shall be manufactured by Mueller, M & H Valve, DeZurik, or Pratt.
- C. Check Valves
  1. Check valves shall be iron body, bronze mounted. They shall be outside weight and lever type (unless specified otherwise by the ENGINEER or indicated as such on the Plans) with bronze seat, hinge and guide busting. Unless otherwise indicated, check valves for interior use shall be flanged and those for exterior use shall be mechanical joint.
- D. Blowoff Assemblies
  1. Blowoff assemblies shall be installed in accordance with the details and Specifications at the locations shown on the Plans or as directed by the ENGINEER for the purpose of removing any obstacles or impurities from the main. The piping shall be the size indicated on the Plans PVC with a standard gate valve sized as indicated and 2 piece cast iron valve box and lid marked "Water". The lid shall be secured with a pentagon lock nut.

## **2.03 FIRE HYDRANTS (FH)**

- A. All fire hydrants shall conform to the requirements of AWWA C502 for 250 psi working pressure. Hydrants shall be the compression type, closing with line pressure. The valve opening shall not be less than [5-1/4-inches].

- B. In the event of a traffic accident, the hydrant barrel shall break away from the standpipe at a point above grade and in a manner which will prevent damage to the barrel and stem, preclude opening of the valve, and permit rapid and inexpensive restoration without digging or cutting off the water.
- C. The means for attaching the barrel to the standpipe shall permit facing the hydrant a minimum of eight different directions.
- D. Hydrants shall be fully bronze mounted with all working parts of bronze. Valve seat ring shall be bronze and shall screw into a bronze retainer.
- E. All working parts, including the seat ring shall be removable through the top without disturbing the barrel of the hydrant.
- F. The operating nut shall match those on the existing hydrants. The operating threads shall be totally enclosed in an operating chamber, separated from the hydrant barrel by a rubber O-ring stem seal and lubricated by a grease or an oil reservoir.
- G. Hydrant shall be a non-freezing design and be provided with a simple, positive, and automatic drain which shall be fully closed whenever the main valve is opened.
- H. Hose and pumper connections shall be breech-locked, pinned, or threaded and pinned to seal them into the hydrant barrel. Each hydrant shall have two 4-1/2-inch pumper connections, all with National Standard threads and each equipped with cap and non-kinking chain.
- I. Hydrants shall be furnished with a mechanical joint connection to the spigot of the 6-inch hydrant lead.
- J. Minimum depth of bury shall be 4.5 feet. Provide extension section where necessary for proper vertical installation and in accordance with manufacturer's recommendations.
- K. All outside surfaces of the barrel above grade shall be painted with enamel equal to Koppers Glamortex 501 in a color to be selected by the OWNER.
- L. Hydrants shall be traffic model and shall be Mueller Super Centurion Model A-425.

## **2.04 VALVE BOXES (VB) AND EXTENSION STEMS**

- A. All valves shall be equipped with valve boxes. The valve boxes shall be cast iron two-piece screw type with drop covers. Valve boxes shall have a 5.25-inch inside diameter. Valve box covers shall weigh a minimum of 13 pounds. The valve boxes shall be adjustable to 6-inches up or down from the nominal required cover over the pipe. Valve boxes shall be of sufficient length that bottom flange of the lower belled portion of the box is below the valve operating nut. Ductile or cast iron extensions shall be provided as necessary. Covers shall have "WATER VALVE" or "WATER" cast into them. Valve boxes shall be manufactured in the United States.
- B. All valves shall be furnished with extension stems, as necessary, to bring the operating nut to within 30-inches of the top of the valve box. Connection to the valve shall be with a wrench nut coupling and a set screw to secure the coupling to the valve's operating nut. The coupling and square wrench nut shall be welded to the extension stem. Extension stems shall be equal to Mueller A-26441 or M & H Valve Style 3801.
- C. All Valve Boxes shall be installed with Concrete Collars as Indicated on the Detail Sheet.

## **2.05 VALVE MARKERS (VM)**

The CONTRACTOR shall provide a concrete valve marker as detailed on the Drawings for each valve installed. Valve markers shall be stamped "Water".

## **2.06 TAPPING SLEEVES AND VALVES (TS&V)**

Tapping sleeves shall be stainless steel of the split-sleeve, mechanical joint type. The CONTRACTOR shall be responsible for determining the outside diameter of the pipe to be connected to prior to ordering the sleeve. Valves shall be gate valves furnished in accordance with the specifications shown above, with flanged connection to the tapping sleeve and mechanical joint connection to the branch pipe. The tapping sleeve and valve shall be supplied by the valve manufacturer. Tapping sleeves shall be equal to American-Darling, Mueller or M & H Valve.

## **2.07 TAPPING SADDLES**

Tapping saddles shall be brass body type with O-ring gasket. Tapping saddles shall be equal to Mueller Series H-134 Service Clamp.

## **2.08 CORPORATION COCKS AND CURB STOPS**

Corporation cocks and curb stops shall be ground key type, shall be made of bronze conforming to ASTM B 61 or B 62, and shall be suitable for the working pressure of the system. Ends shall be suitable for flared tube compression type joint. Threaded ends for inlet and outlet of corporation cocks shall conform to AWWA C800; coupling nut for connection to flared copper tubing shall conform to ANSI B16.26. Corporation cocks and curb stops shall be manufactured by Mueller or Ford or approved equal.

## **2.09 AIR VALVES**

- A. Air Release Valves: Air release valves shall be one of the following types:
1. The air release valve shall automatically release air accumulations from the pipeline due to the action of the float. When the air valve body fills with air, the float falls freely from the orifice to allow the air to escape to the atmosphere. When all the air has been exhausted from the valve body, the float will be buoyed up to seat against the orifice and prevent water from being exhausted from the valve. The valve body and cover shall be constructed of cast iron (ASTM A 126-B). A synthetic orifice button shall be affixed to the valve cover to provide a non-corrosive seat for the float. The float shall be constructed of stainless steel. A resilient, Buna-N seat shall be attached to the float for drop-tight closure. The float shall be free floating within the valve body. Valve orifice size shall be as shown on the Drawings.
  2. The air release valve shall automatically release air accumulations from the pipeline due to the action of the float and lever mechanism. When the air valve body fills with air, the float falls. Through the leverage mechanism, this causes the resilient seat to open the orifice and allow the air to escape to the atmosphere. When all the air has been exhausted from the valve body, the float will be buoyed up. Through the leverage mechanism, this will cause the resilient seat to close the orifice, preventing water from being exhausted from the valve. The valve body and cover shall be constructed of cast iron (ASTM A 126-B). The float shall be constructed of stainless steel and attached to a stainless steel lever mechanism. A resilient, Buna-N seat shall be attached to the lever mechanism for drop-tight closure. Valve orifice size shall be as shown on the Drawings.

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- B. **Air/Vacuum Valve:** The air/vacuum valve shall discharge large amounts of air as the pipeline fills and allow air to enter the pipeline as it drains or in the event of vacuum conditions. The valve shall operate by means of a non-collapsible stainless steel float which seals an orifice. As air enters the valve the float shall drop from the orifice and allow the air to escape. As water rises in the valve, the float will again seal the orifice. The valve will be of such design that the float cannot blow shut at any air velocity. All working parts shall be of stainless steel. The inside of the valve body shall be epoxy coated. Valve inlet size shall be as shown on the Drawings.
- C. **Combination Air Valves:** Combination air valves shall combine the features of an air release valve and an air/vacuum valve and shall be of one of the following types:
1. Valve shall consist of an air/vacuum valve described in paragraph B. above, with an air release valve described in A. above tapped into its body. The valve shall be of two-piece body design with an isolation gate valve separating the two valves.
  2. Valve shall be single body, double orifice, allowing large volumes of air to escape out the larger diameter air and vacuum orifice when filling a pipeline and closes watertight when the liquid enters the valve. During large orifice closure, the smaller diameter air release orifice will open to allow small pockets of air to escape automatically and independently of the large orifice. The large air/vacuum orifice shall also allow large volumes of air to enter through the orifice during pipeline drainage to break the vacuum. The Buna-N seats must be fastened to the valve, without distortion, for drop-tight shut-off. The float shall be stainless steel. Valve sizes shall be as shown on the Drawings.
- D. **Surge Check Valve:** Where shown on the Drawings or specified, provide a surge check valve on the inlet of the air/vacuum valve. The surge check valve shall be normally open, spring loaded valve consisting of a body, seat and plug bolted to the inlet of the air/vacuum valve. The surge check shall operate on the interphase between the kinetic energy and relative velocity flows of air and water, allowing air to pass through but water shall close the surge check, reducing the rate of water flow by means of throttling orifices in the plug to prevent shock closure of the air/vacuum valve. The surge check orifices must be an adjustable type to suit operating conditions in the field.

- E. All air valves and accessories shall be supplied by a single manufacturer and shall be G.A. Industries, APCO, Crispin or Val-Matic.

## **2.10 METER SETTERS**

The meter setter shall be a tandem coppersetter as shown on the standard detail drawings with 3/4" double purpose ends and be 15" high with padlock wing. It shall be all purpose, designed for 5/8" x 3/4" meter and be of sufficient height to raise meters above the bottom of the meter box. The meter setter shall be Ford, or equal. Meter setters shall have an inverted key inlet valve.

Setters shall be installed so that the meters are centered in the meter box.

The water service line shall be extended a minimum of 18" beyond the meter box on the customer end. The end of the extension shall be capped or plugged to prevent entry of foreign material until the connection is made.

## **2.11 WATER METERS**

Water meter shall be cold water displacement type meeting all requirement of AWWA C700-77. The meter sizes shall be 5/8-inch x 3/4-inch meters for 3/4" service rated at a flow of 20 gpm and 1" meters for 1" service rated at a flow of 50 gpm. Meters shall be of frost-proof design and be rotating disk type. The meters shall be equipped with a straight-reading register recording in U.S. Gallons hermetically sealed to prevent fogging and with a removable corrosion resistant strainer screen between the outer case and measuring chamber. Register shall be equipped with a device to afford capability for accurately testing each meter according to AWWA Standards. The body case shall have the manufacturer's serial number imprinted thereon and have raised markings to indicate the direction of flow.

Water meters shall be Badger Model 25.

## **2.12 HYDRANT TEES (Not Used)**

## **2.13 ANCHOR COUPLINGS (Not Used)**



**2.14 VALVE KEYS**

The CONTRACTOR shall provide to the OWNER one valve key for every five valves provided, but no more than three and not less than one valve key. Valve keys shall be 72-inches long with a tee handle and a 2-inch square wrench nut. Valve keys shall be furnished by the valve manufacturer. Valve keys shall be equal to Mueller A-24610 or ACIPCO No. 1303.

**2.15 CONCRETE**

Concrete shall have a compressive strength of not less than 3000 psi, with not less than 5.5 bags of cement per cubic yard and a slump between 3 and 5-inches. For job mixed concrete, submit the concrete mix design for approval by the ENGINEER. Ready-mixed concrete shall be mixed and transported in accordance with ASTM C 94. Reinforcing steel shall conform to the requirements of ASTM A 615, Grade 60.

**PART 3 EXECUTION****3.01 EXISTING UTILITIES AND OBSTRUCTIONS**

- A. The Drawings indicate utilities or obstructions that are known to exist according to the best information available to the OWNER. The CONTRACTOR shall call the agencies or departments that own and/or operate utilities in the vicinity of the construction work site at least 72 hours (three business days) prior to construction to verify the location of the existing utilities.
- B. Existing Utility Location: The following steps shall be exercised to avoid interruption of existing utility service.
  - 1. Provide the required notice to the utility owners and allow them to locate their facilities. Field utility locations are valid for only 10 days after original notice. The CONTRACTOR shall ensure, at the time of any excavation, that a valid utility location exists at the point of excavation.
  - 2. Expose the facility, for a distance of at least 200 feet in advance of pipeline construction, to verify its true location and grade. Repair, or have repaired, any damage to utilities resulting from locating or exposing their true location.

3. Avoid utility damage and interruption by protection with means or methods recommended by the utility owner.
4. Maintain a log identifying when phone calls were made, who was called, area for which utility relocation was requested and work order number issued, if any. The CONTRACTOR shall provide the ENGINEER an updated copy of the log bi-weekly, or more frequently if required.

C. Conflict with Existing Utilities

1. Horizontal Conflict: Horizontal conflict shall be defined as when the actual horizontal separation between a utility, main, or service and the proposed water main does not permit safe installation of the water main by the use of sheeting, shoring, tying-back, supporting, or temporarily suspending service of the parallel or crossing facility. The CONTRACTOR may change the proposed alignment of the water main to avoid horizontal conflicts if the new alignment remains within the available right-of-way or easement, complies with regulatory agency requirements and after a written request to and subsequent approval by the ENGINEER or OWNER. Where such relocation of the water main is denied by the ENGINEER or OWNER, the CONTRACTOR shall arrange to have the utility, main, or service relocated.
2. Vertical Conflict: Vertical conflict shall be defined as when the actual vertical separation between a utility, main, or service and the proposed water main does not permit the crossing without immediate or potential future damage to the utility, main, service, or the water main. The CONTRACTOR may change the proposed grade of the water main to avoid vertical conflicts if the changed grade maintains adequate cover and complies with regulatory agencies requirements after written request to and subsequent approval by the ENGINEER or OWNER. Where such relocation of the water main is denied by the ENGINEER or OWNER, the CONTRACTOR shall arrange to have the utility, main, or service relocated.

- D. Electronic Locator: Have available at all times an electronic pipe locator and a magnetic locator, in good working order, to aid in locating existing pipe lines or other obstructions.

E. Water and Sewer Separation

1. Water mains should maintain a minimum 10 foot edge-to-edge separation from sewer lines, whether gravity or pressure. If the main cannot be installed in the prescribed easement or right-of-way and provide the 10

foot separation, the separation may be reduced, provided the bottom of the water main is a minimum of 18-inches above the top of the sewer. Should neither of these two separation criteria be possible, the water main shall be installed below the sewer with a minimum vertical separation of 18-inches.

2. The water main, when installed below the sewer, shall be encased in concrete with a minimum 6-inch concrete depth to the first joint in each direction. Where water mains cross the sewer, the pipe joint adjacent to the pipe crossing the sewer shall be cut to provide maximum separation of the pipe joints from the sewer.
3. No water main shall pass through, or come in contact with, any part of a sanitary sewer manhole.

### **3.02 CONSTRUCTION ALONG HIGHWAYS, STREETS AND ROADWAYS**

- A. Install pipe lines and appurtenances along highways, streets and roadways in accordance with the applicable regulations of, and permits issued by, the Department of Transportation, Nelson County and the City of New Haven with reference to construction operations, safety, traffic control, road maintenance and repair.
- B. Traffic Control
  1. The CONTRACTOR shall provide, erect and maintain all necessary barricades, suitable and sufficient lights and other traffic control devices; provide qualified flagmen where necessary to direct traffic; take all necessary precautions for the protection of the work and the safety of the public.
  2. Construction traffic control devices and their installation shall be in accordance with the current Manual On Uniform Traffic Control Devices for Streets and Highways and the Department of Highways Specifications, latest edition.
  3. Placement and removal of construction traffic control devices shall be coordinated with the Department of Transportation, Nelson County, and the City of New Haven a minimum of 48 hours in advance of the activity.

4. Placement of construction traffic control devices shall be scheduled ahead of associated construction activities. Construction time in street right-of-way shall be conducted to minimize the length of time traffic is disrupted. Construction traffic control devices shall be removed immediately following their useful purpose. Traffic control devices used intermittently, such as "Flagmen Ahead", shall be removed and replaced when needed.
5. Existing traffic control devices within the construction work zone shall be protected from damage. Traffic control devices requiring temporary relocation shall be located as near as possible to their original vertical and horizontal locations. Original locations shall be measured from reference points and recorded in a log prior to relocation. Temporary locations shall provide the same visibility to affected traffic as the original location. Relocated traffic control devices shall be reinstalled in their original locations as soon as practical following construction.
6. Construction traffic control devices shall be maintained in good repair and shall be clean and visible to affected traffic for daytime and nighttime operation. Traffic control devices affected by the construction work zone shall be inspected daily.
7. Construction warning signs shall be black legend on an orange background. Regulatory signs shall be black legend on a white background. Construction sign panels shall meet the minimum reflective requirements of the Department of Transportation, Nelson County, and the City of New Haven. Sign panels shall be of durable materials capable of maintaining their color, reflective character and legibility during the period of construction.
8. Channelization devices shall be positioned preceding an obstruction at a taper length as required by the current Manual On Uniform Traffic Control Devices for Streets and Highways, as appropriate for the speed limit at that location. Channelization devices shall be patrolled to insure that they are maintained in the proper position throughout their period of use.

#### C. Construction Operations

1. Perform all work along highways, streets and roadways to minimize interference with traffic.
2. Stripping: Where the pipe line is laid along road right-of-way, strip and stockpile all sod, topsoil and other material suitable for right-of-way restoration.

3. Trenching, Laying and Backfilling: Do not open the trench any further ahead of pipe laying operations than is necessary. Backfill and remove excess material immediately behind laying operations. Complete excavation and backfill for any portion of the trench in the same day.
  4. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders.
  5. Construction operations shall be limited to 400 feet along areas within KYDOT jurisdiction, including clean-up and utility exploration.
- D. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated material off of the pavement in a timely manner.
- E. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.
1. The CONTRACTOR shall make provisions for handling all flows in existing creeks, ditches, sewers and trenches by pipes, flumes or other approved methods at all times when his operations would, in any way, interfere with the natural functioning of said creeks, ditches, sewers and drains. The CONTRACTOR shall at all times during construction provide and maintain sufficient equipment for the disposal of all water which enters the excavation, both in open cut trenches and in tunnels, to render such excavation firm and dry, until the structures to be built thereon are completed.
- F. Landscaping Features: Landscaping features shall include, but are not necessarily limited to: fences; property corners; cultivated trees and shrubbery; manmade improvements; subdivision and other signs within the right-of-way and easement. The CONTRACTOR shall take extreme care in moving landscape features and promptly re-establishing these features.
- G. Maintaining Highways, Streets, Roadways and Driveways
1. Maintain streets, highways, roadways and driveways in suitable condition for movement of traffic until completion and final acceptance of the Work.

All excavation shall be conducted in a manner to the last interruption to traffic.

2. During the time period between pavement removal and completing permanent pavement replacement, maintain highways, streets and roadways by the use of steel running plates. Running plate edges shall have asphalt placed around their periphery to minimize vehicular impact. The backfill above the pipe shall be compacted as specified elsewhere up to the existing pavement surface to provide support for the steel running plates.
3. Furnish a road grader or front-end loader for maintaining highways, streets, and roadways. The grader or front-end loader shall be available at all times.
4. Immediately repair all driveways that are cut or damaged. Maintain them in a suitable condition for use until completion and final acceptance of the Work. Driveways and other private and public access routes shall not be kept blocked or closed by the CONTRACTOR for more than a reasonable period of time without prior written approval from the property owner or controlling authority.
5. Maintenance of all traffic shall be in accordance with any requirements of the local road department(s) and/or the Kentucky Department of Transportation. It is the responsibility of the CONTRACTOR to coordinate all work with and notify the above-named agencies, and to provide all necessary signs, barricades, lights, flagmen, and other items for maintenance of traffic.

Public travel shall be maintained, unrestricted, wherever and whenever possible. Detours shall be provided when so directed by the appropriate agency. Adequate precautions shall be taken to provide for the safety of both vehicular and pedestrian traffic. Emergency vehicles shall be provided access to construction area at all times.

Unless specifically directed otherwise by the ENGINEER, not more than five hundred (500') feet of trench shall be opened ahead of the pipe laying, and not more than five hundred (500') feet of open ditch shall be left behind the pipe laying. All barricades, lanterns, watchmen, and other such signs and signals as may be necessary to warn the public of the dangers in connection with open trenches, excavations and other obstructions, shall be provided by and at the expense of the CONTRACTOR.

When so required, or when directed by the ENGINEER, only one-half (1/2) of the street crossing and road crossings shall be excavated before placing temporary bridges over the side excavated for the convenience of the traveling public.

All backfilled ditches shall be maintained in such manner that they will offer no hazard to the traveling public and the property owners abutting the improvements shall be taken into consideration. All public or private drives shall be promptly backfilled or bridges at the direction of the ENGINEER. Excavated materials shall be disposed of so as to cause the least interference, and in every case the deposition of excavated materials shall be satisfactory to the ENGINEER.

#### H. Property Protection

1. Extreme care shall be taken to protect trees, fences, poles, crops and all other property from damage unless their removal is authorized by the ENGINEER. Any damaged property shall be restored to as good as or better than original condition and shall meet with the approval of the ENGINEER and OWNER.
2. The CONTRACTOR has the right to fully utilize the easement unless specifically stated otherwise on the plans or by the ENGINEER. If any irreplaceable trees, fences, poles or crops, such as tobacco, corn, soy beans and such (excluding pasture land), occur on the easement the CONTRACTOR shall obtain the ENGINEER's and OWNER's approval prior to removing or otherwise causing damage to any of these items.
3. Beyond the limits of the easement the CONTRACTOR shall be responsible for any damage caused by his operations and/or his personnel.

### **3.03 PIPE DISTRIBUTION**

- A. Pipe shall be distributed and placed in such a manner that will not interfere with traffic.
- B. No pipe shall be strung further along the route than 1000 feet beyond the area in which the CONTRACTOR is actually working without written permission from the OWNER.

- C. No street or roadway may be closed for unloading of pipe without first obtaining permission from the proper authorities. The CONTRACTOR shall furnish and maintain proper warning signs and obstruction lights for the protection of traffic along highways, streets and roadways upon which pipe is distributed.
- D. No distributed pipe shall be placed inside drainage ditches.
- E. Distributed pipe shall be placed as far as possible from the roadway pavement, but no closer than five feet from the roadway pavement, as measured edge-to-edge.

### **3.04 LOCATION AND GRADE**

- A. The Drawings show the alignment of the water main and the location of valves, hydrants and other appurtenances.
- B. Construction Staking
  - 1. The base lines for locating the principal components of the work and a bench marks adjacent to the work are shown on the Drawings if Available. Base lines shall be defined as the line to which the location of the water main is referenced, i.e., edge of pavement, road centerline, property line, right-of-way or survey line. The CONTRACTOR shall be responsible for performing all survey work required for constructing the water main, including the establishment of base lines and any detail surveys needed for construction. This work shall include the staking out of permanent and temporary easements to insure that the CONTRACTOR is not deviating from the designated easements.
  - 2. The level of detail of survey required shall be that which the correct location of the water main can be established for construction and verified by the ENGINEER or OWNER. Where the location of components of the water main, e.g. tunnels and fittings, are not dimensioned, the establishment on the location of these components shall be based upon scaling these locations from the Drawings with relation to readily identifiable land marks, e.g., survey reference points, power poles, manholes, etc.



C. Reference Points

1. The CONTRACTOR shall take all precautions necessary, which includes, but is not necessarily limited to, installing reference points, in order to protect and preserve the centerline or baseline established by the ENGINEER.
2. Reference points shall be placed, at or no more than three feet, from the outside of the construction easement or right-of-way. The location of the reference points shall be recorded in a log with a copy provided to the ENGINEER and OWNER for use, prior to verifying reference point locations. Distances between reference points and the manhole centerlines shall be accurately measured to 0.01 foot.
3. The CONTRACTOR shall give the ENGINEER reasonable notice that reference points are set. The reference point locations must be verified by the ENGINEER prior to commencing clearing and grubbing operations.

D. After the CONTRACTOR locates and marks the water main centerline or baseline, the CONTRACTOR shall perform clearing and grubbing.

E. Construction shall begin at a connection location and proceed without interruption. Multiple construction sites shall not be permitted without written authorization from the ENGINEER for each site.

F. The CONTRACTOR shall be responsible for any damage done to reference points, base lines, center lines and temporary bench marks, and shall be responsible for the cost of re-establishment of reference points, base lines, center lines and temporary bench marks as a result of the operations.

**3.05 LAYING AND JOINTING PIPE AND ACCESSORIES**

A. Lay all pipe and fittings to accurately conform to the lines and grades established by the ENGINEER.

B. Pipe Installation

1. Proper implements, tools and facilities shall be provided for the safe performance of the Work. All pipe, fittings, valves and hydrants shall be lowered carefully into the trench by means of slings, ropes or other suitable tools or equipment in such a manner as to prevent damage to water main

materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

2. All pipe, fittings, valves, hydrants and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the ENGINEER, who may prescribe corrective repairs or reject the materials.
3. All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and free from dirt, sand, grit or any foreign materials before the pipe is laid. No pipe containing dirt shall be laid.
4. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.
5. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.
6. It is not mandatory to lay pipe with the bells facing the direction in which work is progressing.
7. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade, shall not be permitted.
8. Detection tape shall be buried 4 to 10-inches deep. Should detection tape need to be installed deeper, the CONTRACTOR shall provide 3-inch wide tape. In no case shall detection tape be buried greater than 20-inches from the finish grade surface.

#### C. Alignment and Gradient

1. Lay pipe straight in alignment and gradient or follow true curves as nearly as practicable. Do not deflect any joint more than the maximum deflection recommended by the manufacturer.
2. Maintain a transit, level and accessories on the job to lay out angles and ensure that deflection allowances are not exceeded.

- D. **Expediting of Work:** Excavate, lay the pipe, and backfill as closely together as possible. Do not leave unjointed pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe or accessory, close the end with a suitable plug, either push-on, mechanical joint, restrained joint or as approved by the ENGINEER.
- E. **Joint Assembly**
1. Push-on, mechanical, flange and restrained type joints shall be assembled in accordance with the manufacturer's recommendations.
  2. The CONTRACTOR shall inspect each pipe joint within 200 feet on either side of main line valves to insure 100 percent seating of the pipe spigot, except as noted otherwise.
  3. Each restrained joint shall be inspected by the CONTRACTOR to ensure that it has been "homed" 100 percent.
  4. The CONTRACTOR shall internally inspect each pipe joint to insure proper assembly for pipe 24-inches in diameter and larger after the pipe has been brought to final alignment.
- F. **Cutting Pipe:** Cut ductile iron pipe using an abrasive wheel saw. Cut PVC pipe using a suitable saw; remove all burrs and smooth the end before jointing. The CONTRACTOR shall cut the pipe and bevel the end, as necessary, to provide the correct length of pipe necessary for installing the fittings, valves, accessories and closure pieces in the correct location. Only push-on or mechanical joint pipe shall be cut.
- G. **Polyethylene Encasement:** Installation shall be in accordance with AWWA C105 and the manufacturer's instructions. All ends shall be securely closed with tape and all damaged areas shall be completely repaired to the satisfaction of the ENGINEER.
- H. **Valve and Fitting Installation**
1. Prior to installation, valves shall be inspected for direction of opening, number of turns to open, freedom of operation, tightness of pressure-containing bolting and test plugs, cleanliness of valve ports and especially

seating surfaces, handling damage and cracks. Defective valves shall be corrected or held for inspection by the ENGINEER. Valves shall be closed before being installed.

2. Valves, fittings, plugs and caps shall be set and joined to the pipe in the manner specified in this Section for cleaning, laying and joining pipe, except that 12-inch and larger valves shall be provided with special support, such as treated timbers, crushed stone, concrete pads or a sufficiently tamped trench bottom so that the pipe will not be required to support the weight of the valve. Valves shall be installed in the closed position.
3. A valve box shall be provided on each underground valve. They shall be carefully set, centered exactly over the operating nut and truly plumbed. The valve box shall not transmit shock or stress to the valve. The bottom flange of the lower belled portion of the box shall be placed below the valve operating nut. This flange shall be set on brick, so arranged that the weight of the valve box and superimposed loads will bear on the base and not on the valve or pipe. Extension stems shall be installed where depth of bury places the operating nut in excess of 30-inches beneath finished grade so as to set the top of the operating nut 30-inches below finished grade. The valve box cover shall be flush with the surface of the finished area or such other level as directed by the ENGINEER.
4. In no case shall valves be used to bring misaligned pipe into alignment during installation. Pipe shall be supported in such a manner as to prevent stress on the valve.
5. A valve marker shall be provided for each underground valve. Unless otherwise detailed on the Drawings or directed by the ENGINEER, valve markers shall be installed 6-inches inside the right-of-way or easement.

#### I. Hydrant Installation

1. Prior to installation, inspect all hydrants for direction of opening, nozzle threading, operating nut and cap nut dimensions, tightness of pressure-containing bolting, cleanliness of inlet elbow, handling damage and cracks. Defective hydrants shall be corrected or held for inspection by the ENGINEER.

2. All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the roadway, with pumper nozzle facing the roadway, except that hydrants having two-hose nozzles 90 degrees apart shall be set with each nozzle facing the roadway at an angle of 45 degrees.
3. Hydrants shall be set to the established grade, with the centerline of the lowest nozzle at least 12-inches above the ground or as directed by the ENGINEER.
4. Each hydrant shall be connected to the main with a 6-inch branch controlled by an independent 6-inch valve. When a hydrant is set in soil that is pervious, drainage shall be provided at the base of the hydrant by placing coarse gravel or crushed stone mixed with coarse sand from the bottom of the trench to at least 6-inches above the drain port opening in the hydrant to a distance of 12-inches around the elbow.
5. When a hydrant is set in clay or other impervious soil, a drainage pit 2 x 2 x 2 feet shall be excavated below each hydrant and filled with coarse gravel or crushed stone mixed with coarse sand under and around the elbow of the hydrant and to a level of 6-inches above the drain port.
6. Hydrants shall be located as shown on the Drawings or as directed by the ENGINEER. In the case of hydrants that are intended to fail at the ground-line joint upon vehicle impact, specific care must be taken to provide adequate soil resistance to avoid transmitting shock moment to the lower barrel and inlet connection. In loose or poor load bearing soil, this may be accomplished by pouring a concrete collar approximately 6-inches thick to a diameter of 24-inches at or near the ground line around the hydrant barrel.

### **3.06 CONNECTIONS TO WATER MAINS**

- A. Make connections to existing pipe lines with tapping sleeves and valves, unless specifically shown otherwise on the Drawings.
- B. Location: Before laying pipe, locate the points of connection to existing water mains and uncover as necessary for the ENGINEER or OWNER to confirm the nature of the connection to be made.
- C. Interruption of Services: Make connections to existing water mains only when system operations permit. Operate existing valves only with the specific authorization and direct supervision of the OWNER.

D. Tapping Saddles and Tapping Sleeves

1. Holes in the new pipe shall be machine cut, either in the field or at the factory. No torch cutting of holes shall be permitted.
2. Prior to attaching the saddle or sleeve, the pipe shall be thoroughly cleaned, utilizing a brush and rag, as required.
3. Before performing field machine cut, the watertightness of the saddle or sleeve assembly shall be pressure tested. The interior of the assembly shall be filled with water. An air compressor shall be attached, which will induce a test pressure as specified in this Section. No leakage shall be permitted for a period of five minutes.
4. After attaching the saddle or sleeve to an existing main, but prior to making the tap, the interior of the assembly shall be disinfected. All surfaces to be exposed to potable water shall be swabbed or sprayed with a one percent hypochlorite solution.

E. Connections Using Solid Sleeves: Where connections are shown on the Drawings using solid sleeves, the CONTRACTOR shall furnish materials and labor necessary to make the connection to the existing pipe line.

F. Connections Using Couplings: Where connections are shown on the Drawings using couplings, the CONTRACTOR shall furnish materials and labor necessary to make the connection to the existing pipe line, including all necessary cutting, plugging and backfill.

**3.07 VALVE BOX ADJUSTMENT (Not Used)**

**3.08 THRUST RESTRAINT**

A. Provide restraint at all points where hydraulic thrust may develop.

B. Concrete Blocking

1. Provide concrete blocking for all bends, tees, valves, and other points where thrust may develop, except where other exclusive means of thrust restraint are specifically shown on the Drawings.
2. Concrete shall be as specified in this Section.

3. Form and pour concrete blocking at fittings as shown on the Drawings and as directed by the ENGINEER. Pour blocking against undisturbed earth. Increase dimensions when required by over excavation.

### **3.09 INSPECTION AND TESTING**

#### **A. Pressure and Leakage Test**

1. All sections of the water main subject to internal pressure shall be pressure tested in accordance with AWWA C600. A section of main will be considered ready for testing after completion of all thrust restraint and backfilling.
2. Each segment of water main between main valves shall be tested individually. At no time shall the segment being tested exceed 3,500 feet without prior approval of the ENGINEER.
3. Test Preparation
  - a. For water mains less than 24-inches in diameter, flush sections thoroughly at flow velocities, greater than 2.5 feet per second, adequate to remove debris from pipe and valve seats. For water mains 24-inches in diameter and larger, the main shall be carefully swept clean, and mopped if directed by the ENGINEER. Partially open valves to allow the water to flush the valve seat.
  - b. Partially operate valves and hydrants to clean out seats.
  - c. Provide temporary blocking, bulkheads, flanges and plugs as necessary, to assure all new pipe, valves and appurtenances will be pressure tested.
  - d. Before applying test pressure, air shall be completely expelled from the pipeline and all appurtenances. Insert corporation cocks at highpoints to expel air as main is filled with water as necessary to supplement automatic air valves. Corporation stops shall be constructed as detailed on the Drawings with a meter box.
  - e. Fill pipeline slowly with water. Provide a suitable pump with an accurate water meter to pump the line to the specified pressure.

- f. The differential pressure across a valve or hydrant shall equal the maximum possible, but not exceed the rated working pressure. Where necessary, provide temporary backpressure to meet the differential pressure restrictions.
  - g. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure.
4. Test Pressure: Test the pipeline at 50 psi above the rated working pressure of the pipe, measured at the lowest point, for at least two hours. Maintain the test pressure within 5 psi of the specified test pressure for the test duration. Should the pressure drop more than 5 psi at any time during the test period, the pressure shall be restored to the specified test pressure. Provide an accurate pressure gage with graduation not greater than 5 psi.
5. Leakage
- a. Leakage shall be defined as the sum of the quantity of water that must be pumped into the test section, to maintain pressure within 5 psi of the specified test pressure for the test duration plus water required to return line to test pressure at the end of the test. Leakage shall be the total cumulative amount measured on a water meter.
  - b. The OWNER assumes no responsibility for leakage occurring through existing valves.
6. Test Results: No test section shall be accepted if the leakage exceeds the limits determined by the following formula:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

Where:

L	=	allowable leakage, in gallons per hour
S	=	length of pipe tested, in feet
D	=	nominal diameter of the pipe, in inches
P	=	average test pressure during the leakage test, in pounds per square inch (gauge)

As determined under Section 4 of AWWA C600.

If the water main section being tested contains lengths of various pipe diameters, the allowable leakage shall be the sum of the computed leakage for each diameter. The leakage test shall be repeated until the test section



is accepted. All visible leaks shall be repaired regardless of leakage test results.

7. Completion: After a pipeline section has been accepted, relieve test pressure. Record type, size and location of all outlets on record drawings.

### **3.10 DISINFECTING PIPELINE**

- A. After successfully pressure testing each pipeline section, disinfect in accordance with AWWA C651 for the continuous-feed method and these Specifications.
- B. Specialty Contractor: Disinfection may be performed by an approved specialty contractor. Before disinfection is performed, the CONTRACTOR shall submit a written procedure for approval before being permitted to proceed with the disinfection. This plan shall also include the steps to be taken for the neutralization of the chlorinated water.
- C. Chlorination
  1. Apply chlorine solution to achieve a concentration of at least 50 milligrams per liter free chlorine in new line. Retain chlorinated water for 24 hours.
  2. Chlorine concentration shall be recorded at every outlet along the line at the beginning and end of the 24 hour period.
  3. After 24 hours, all samples of water shall contain at least 25 milligrams per liter free chlorine. Re-chlorinate if required results are not obtained on all samples.
- D. Disposal of Chlorinated Water: Reduce chlorine residual of disinfection water to less than one milligram per liter if discharged directly to a body of water or to less than two milligrams per liter if discharged onto the ground prior to disposal. Treat water with sulfur dioxide or other reducing chemicals to neutralize chlorine residual. Flush all lines until residual is equal to existing system.
- E. Bacteriological Testing: After final flushing and before the main is placed into service, the CONTRACTOR shall assist the OWNER in collecting samples from the line to have tested for bacteriological quality. Testing shall be performed by the OWNER at a laboratory certified by the State of Kentucky. Re-chlorinate lines until the required results are obtained.

**3.11 PROTECTION AND RESTORATION OF WORK AREA**

- A. General: Return all items and all areas disturbed, directly or indirectly by work under these Specifications, to their original condition or better, as quickly as possible after work is started.
1. The CONTRACTOR shall plan, coordinate, and prosecute the work such that disruption to personal property and business is held to a practical minimum.
  2. All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of underground facilities, ditches, and disturbed areas shall be accomplished on a daily basis as work is completed. Finishing, dressing, and grassing shall be accomplished immediately thereafter, as a continuous operation within each area being constructed and with emphasis placed on completing each individual yard or business frontage. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.
  3. Handwork, including raking and smoothing, shall be required to ensure that the removal of roots, sticks, rocks, and other debris is removed in order to provide a neat and pleasing appearance.
  4. The Department of Transportation's engineer shall be authorized to stop all work by the CONTRACTOR when restoration and cleanup are unsatisfactory and to require appropriate remedial measures.
- B. Man-Made Improvements: Protect, or remove and replace with the ENGINEER'S approval, all fences, walkways, mail boxes, pipe lines, drain culverts, power and telephone lines and cables, property pins and other improvements that may be encountered in the Work.
- C. Cultivated Growth: Do not disturb cultivated trees or shrubbery unless approved by the ENGINEER. Any such trees or shrubbery which must be removed shall be heeled in and replanted under the direction of an experienced nurseryman.
- D. Cutting of Trees: Do not cut trees for the performance of the work except as absolutely necessary. Protect trees that remain in the vicinity of the work from damage from equipment. Do not store spoil from excavation against the trunks. Remove excavated material stored over the root system of trees within 30 days to allow proper natural watering of the root system. Repair any damaged tree over 3-inches in diameter, not to be removed, under the direction of an

experienced nurseryman. All trees and brush that require removal shall be promptly and completely removed from the work area and disposed of by the CONTRACTOR. No stumps, wood piles, or trash piles will be permitted on the work site.

- E. Disposal of Rubbish: Dispose of all materials cleared and grubbed during the construction of the Project in accordance with the applicable codes and rules of the appropriate county, state and federal regulatory agencies.

END OF SECTION



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**SECTION 02933**  
**Seeding**

**PART 1 GENERAL**

**1.1 SCOPE**

- A. The work covered by this section shall include the establishment of all ground cover including areas to be seeded and sodded. This work shall include the supply of all materials, labor, superintendence and maintenance as outlined in these specifications.
- B. The part of the site not covered by roads, walks, building, etc. shall be seeded according to these specifications. The areas to be sodded shall include a three foot strip immediately adjacent to all roads, walks, and structures, etc.
- C. Before final acceptance of the work, the CONTRACTOR shall satisfactorily clean all areas within the limits of his operations including the street surfaces, walks, gutters, fences, lawns, private property and structures, leaving them in as neat, clean and usable condition as originally found. CONTRACTOR shall remove all machinery, tools, surplus materials, temporary buildings and other structures from the site of work. CONTRACTOR shall also remove all organic matter and materials containing organic matter from all areas and places used by him during construction. All sewers, manholes, inlets, etc., shall be cleared of all scaffolding, sedimentation, debris, rubbish and dirt.

Where the CONTRACTOR's operations have resulted in filling existing ditches, clogging existing culverts, damaging existing bridges, ground surfaces, sidewalks, driveways, etc., the CONTRACTOR shall reditch, clean culverts, repair or replace bridges, ground surfaces, sidewalks, driveways, etc., so as to return them to a condition as good as or better than existed prior to the beginning of his operations.

The CONTRACTOR's cleanup operations, which include repair, restoration or replacement of ground surfaces and existing improvements and the removal of rock, shall be performed continuously during the construction operations.

Following installation of the pipeline, "rough cleanup" work shall be performed. This shall consist of grading the trench to create a neat, low mound of backfill material and disposing of any excavated material, rubbish, etc. Crushed stone shall be added to driveways where necessary and fences repaired to the

satisfaction of the property owners. After trenches have had adequate time to settle, final grade work and seeding shall be performed.

Rough Grade Work and Cleanup (Rough Cleanup) shall be defined to include the final backfill and windrowing of the ditch line, filling and leveling street and driveway cuts, cleaning up and removal of rubbish, repair of fences and structures, and any other such work that may be required to result in a neat, orderly project area. Rough Cleanup shall be performed as other construction progresses and must be completed immediately after the adjacent pipeline construction.

Rough Cleanup is not a separate pay item. The cost for this work shall be included in the unit bid price for waterlines. If Rough Cleanup is not performed as specified, the OWNER will require deductions from partial payment estimates.

Final cleanup, grade work and seeding shall be performed on each line when backfilled trenches have had adequate time to settle, but at least within 2 months from the date each line is constructed. Final grade work and seeding on Kentucky Bureau of Highways rights-of-way shall be done in accordance with said Bureau's specifications and the permit granted to the OWNER specifically for this project.

Where work was performed on private property in lawns, earth of good quality, free from rock shall be spread over the disturbed area and graded and compacted to match adjacent ground contours. The graded area shall be hand raked until smooth and free from rock, potholes, and humps. The disturbed area shall then be seeded with the seed variety used on the original lawn (e.g., a bluegrass lawn shall be reseeded with bluegrass seed) and the seed raked in lightly. The seeded area shall be fertilized and then uniformly covered with straw to a depth of approximately 1-1/2 inches.

Where work was performed on private property and not in lawns the trench line shall be graded and filled if necessary to match adjacent contours. All rock larger than 1-1/2" in diameter shall be removed from the disturbed area. In general, pasture and fallow land shall be fertilized and seeded with Kentucky 31 Fescue and plowed fields shall be left unseeded, however, the desire of each property owner shall govern regarding seeding.

In all cases on private property the rate of seed and fertilizer application shall be that recommended by the University of Kentucky Cooperative Extension Service for new plantings of the variety of grass seed used.

If the trench line settles following final grade work or if grass seed fails to germinate within a reasonable time, the CONTRACTOR shall regrade or reseed the area in question as specified above and as directed by the ENGINEER. This shall be done as required throughout the Warranty period of the Project.

The OWNER reserves the right to require the CONTRACTOR to obtain a signed Release from each property owner affected by the work. Said Release shall indicate that the property owner is satisfied with the restoration of his land. However, the execution of such a release shall not relieve the CONTRACTOR from any of his contractual obligations or other claims that may arise at a later date. The widths of construction easements obtained by the OWNER from property owners is normally 20 feet and the CONTRACTOR shall confine his activities to the area within the limits of the easements unless specific permission is obtained by the CONTRACTOR from property owners.

## **PART 2 PRODUCTS**

### **2.1 LIME**

- A. Agriculture lime shall be spread over the entire area to be planted at an average rate of one (1) ton per acre. One tillage operation shall incorporate both the lime and the fertilizer into the soil to a depth of four inches (4").

### **2.2 FERTILIZER**

- A. Two fertilizer materials shall be applied to all areas to be seeded. The first shall be complete commercial fertilizer with 1:2:2 ratio of nitrogen, phosphorus, and potassium. Eight hundred pounds (800 lbs) per acre of a 6-12-12 fertilizer, or equivalent amount of another 1:2:2 ratio fertilizer shall be used.
- B. In addition to a complete fertilizer, a slowly available nitrogen fertilizer shall be applied. Two hundred fifty pounds (250 lbs.) per acre of area formaldehyde (38-0-0) shall be used.
- C. Both fertilizer materials shall be free flowing and suitable for application with approved equipment. Each material shall conform to State fertilizer laws. Bagged fertilizer shall be delivered in sealed standard containers and shall bear the name, trademark, and warranty of the producer. The fertilizers shall be incorporated into the surface four inches (4") by tillage.

### 2.3 SEED

- A. Grass seed shall be fresh, clean and new crop seed composed of the following varieties mixed in the proportion by weight as shown and shall be certified as to varietal purity. All seed shall be mixed by a dealer furnished in sealed standard containers, and tagged with the dealer's guaranteed statement of composition of mixture and percentage of purity and germination. All areas disturbed by construction activity shall be seeded within the following blend at a rate of two hundred pounds (200 lbs.) per acre (4.6 pounds per 1000 square feet).
- B. The quality of seed shall conform to or exceed the minimum requirement for seed quality of the Kentucky Seed Improvement Association and shall meet or exceed the following standards for purity and germination:

Variety	Min% Purity/Germ	Wt.%	Seeding Rate Pounds Per Acre
Kentucky Bluegrass-Kenblue	98/80	20	40
Creeping Red Fescue-Pennlawn	98/85	70	140
Perennial Ryegrass	95/90	10	20

### 2.4 MULCH

- A. Mulch for hydroseeding shall be natural wood cellulose fiber or wood pulp which disperses readily in water and which has no toxic effect when combined with seed or other materials. It shall be a commercially available product made for use in spray applicators. Wood cellulose mulch shall be applied at a rate of 1000 lbs. per acre when work is done in the spring or fall season as defined below and 1500 pounds per acre when work is done during summer months.

### 2.5 SOD

- A. Sod shall be bluegrass sod strongly rooted and free of pernicious weeds. It shall be a uniform thickness of not more than 1 1/2" and shall have not less than 3/4" of soil. All sod shall be grown on a commercial turf farm and no pasture sod shall be acceptable. The source of the sod must be approved by the Engineer before it is cut for delivery.



## **PART 3 EXECUTION**

### **3.1 PLANTING SEASON**

- A. The normal seasonal dates for seeding mixtures containing Kentucky Bluegrass or tall fescue shall be September 1 to October 15 and from the time the soil is workable in the spring to May 15. Seeding of a specified grass variety at times other than the normal seasonal dates must be approved by the ENGINEER. Seeding shall not be done during windy weather or when the ground is excessively wet, frozen or otherwise untillable.

### **3.2 SOIL PREPARATION**

- A. All areas shall be graded to surface drain as shown on the plans. The lime and fertilizer shall be applied at the rates specified above and tilled into the surface 4 inches with approved tillage equipment to provide a reasonably firm, but friable seedbed.
- B. All areas to be seeded or sodded shall meet the specified grades, and be free of any weed or undesirable plant growth or debris.
- C. Lime and fertilizer for all areas shall be applied at the rate specified and incorporated into the top four inches by approved tillage equipment. The seed and wood cellulose mulch shall then be mixed with adequate water to produce a slurry and then applied uniformly with a hydroseeder at the rates specified above. Any area inadequately covered shall be redone as directed by the ENGINEER.

### **3.3 MAINTENANCE OF SEEDED AREAS:**

- A. The CONTRACTOR shall maintain seeded areas until they have been mowed two times by the property owner and then he shall repair eroded areas one time after the second mowing. Each mowing shall be when the grass is about four inches (4") high and cut back to about 2 1/2". After the second mowing, the CONTRACTOR shall notify the ENGINEER that he is ready to repair erosion damage so that an inspection can be scheduled when the erosion repair work is complete. Once the erosion areas have been filled with topsoil, fertilized, seeded and mulched and the work has been inspected and approved by the ENGINEER, the CONTRACTOR may seek a Release from the property owner.

### **3.4 CARE DURING CONSTRUCTION**

- A. The CONTRACTOR shall be responsible for repair to turf areas damaged by his equipment or men until all work is accepted. Temporary haul roads and storage areas shall be tilled to depth of four inches (4") and fertilized, seeded and mulched as specified above.

END OF SECTION

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**SECTION 02957**  
**Erosion Control and Stabilization**

**PART 1      GENERAL**

**1.1            SUMMARY**

- A.      This Section includes provisions for erosion control and stabilization.

**PART 2      PRODUCTS**

**2.1            EROSION CONTROL**

- A.      All drainage paths and swales to be cut, graded, and seeded prior to any utilities trenching.
- B.      All drainage paths and excavated areas to be mulched upon completion of seeding. Straw bales are to be staked perpendicular to flow in bottom of swale every 100 feet along drainage swale route. Straw bales to remain in swale route until a substantial growth of grass has been established. Straw bales are to be staked around all inlet rims where swale lines are excavated to route storm water flow into inlet.
- C.      Erosion control requires immediate seeding and mulching of any stripped and unvegetated areas, including unpaved right-of-ways.

**2.2            SEEDING**

- A.      A leguminous inoculated seed mixture shall be used for all seed areas. Class of seeding as follows:

1.      Mixture A: shall be used for all drainage paths, swales, side slopes, and all other areas where existing lawn is disturbed during construction.

Seed mixture shall be as follows:

2 lbs./1000 sq. ft. - Chewings Fescue  
2 lbs./1000 sq. ft. - Kentucky Bluegrass  
2 lbs./1000 sq. ft. - Perennial Rye

Seed shall be sown at a rate of 6 lbs. per 1000 sq. ft. of area.

2. Mixture B: shall be for all areas disturbed by excavation and re-grading as seasonal or temporary cover in bare areas.

Seed mixture shall be as follows:

1 lb./1000 sq. ft. - Perennial Rye

1 lb./1000 sq. ft. - Annual Rye

Seed shall be sown at a rate of 4 lbs. per 1000 sq. ft. of area.

3. Mixture C: shall be used for all lake or pond banks.

Seed mixture shall be as follows:

20% Perennial Ryegrass

15% Kentucky Bluegrass

15% Creeping Red Fescue

50% Nutri-Kote plus Apron fungicide seed coating.

Seed shall be sown at a rate of 5 lbs. per 1000 sq. ft. of area.

### **2.3 FERTILIZER**

- A. Apply a minimum of 600 lbs. of 12-12-12 fertilizer per acre.

### **2.4 MULCH**

- A. Mulch shall consist of clean, seed-free threshed straw of wheat, rye, oats, or barley. Spread mulch uniformly to form a continuous blanket not less than 1.5 inches loose measurement over "Mixture A" and "Mixture C" seeded areas.
- B. The mulch shall be held in place by being mechanically crimped into the soil, tackified with a bio-degradable tackifier, or netted and stapled to the soil with degradable netting. The mulch should be applied at a minimum rate of 1500 lbs. per acre.

### **2.5 STRAW TACKIFIER - MULCH TACKIFIER**

- A. The tackifier shall be a naturally derived product from all organic sources resulting in a strong resilient muciloid, non-bitumen M-Binder. The product can be used in a hydro-seeder with both 100% Virgin Wood Fiber or Paper Wood Cellulose mulch

and can be sprayed on 100% Wheat Straw Mulch for stabilization from the wind. Application rates vary between 60-140 lbs. per acre depending upon the existing conditions. The product shall be packed in 40 lbs. fiber bags.

Technical Specifications:

Protein Content	1.62
Ash Content	2.7
Fiber	4.0
pH of 1% Solution	6.8
Settleable Solids	5.0

- B. Erosion control requires immediate seeding and mulching of any stripped and un-vegetated areas, including unpaved right-of-ways.

**PART 3 (NOT USED)**

END OF SECTION



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**SECTION 03300**  
**Cast-in-Place Concrete**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.
- B. Cast-in-place concrete includes the following:
  - 1. Foundations and footings
  - 2. Slabs-on-grade
  - 3. Fill for steel deck
  - 4. Foundation walls
  - 5. Shear walls
  - 6. Load-bearing building walls
  - 7. Building frame members
  - 8. Equipment pads and bases
  - 9. Fill for steel pan stairs

**1.3 SUBMITTALS**

- A. General: CONTRACTOR shall submit the following according to Conditions of the Contract and relevant Specification Sections.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others if requested by ENGINEER.
- C. Shop drawings for reinforcement detailing fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.

- D. Shop drawings for formwork indicating fabrication and erection of forms for specific finished concrete surfaces. Show form construction including jointing, special form joints or reveals, location and pattern of form tie placement, and other items that affect exposed concrete visually.
  - 1. ENGINEER's review is for general applications and features only. Designing formwork for structural stability and efficiency is CONTRACTOR's responsibility.
- E. Samples of materials as requested by ENGINEER, including names, sources, and descriptions, as follows:
  - 1. Color finishes
  - 2. Normal weight aggregates
  - 3. Fiber reinforcement
  - 4. Reglets
  - 5. Waterstops
  - 6. Vapor retarder/barrier
  - 7. Form liners
- F. Laboratory test reports for concrete materials and mix design test.
- G. Material certificates in lieu of material laboratory test reports when permitted by ENGINEER. Material certificates shall be signed by manufacturer and CONTRACTOR, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

#### **1.4 QUALITY ASSURANCE**

- A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
  - 1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings"
  - 2. ACI 318, "Building Code Requirements for Reinforced Concrete"
  - 3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice"
- B. Concrete Testing Service: CONTRACTOR shall engage a third party independent testing agency acceptable to ENGINEER to perform material evaluation tests and to design concrete mixes, at no additional cost to OWNER.
- C. Materials and installed work may require testing and retesting at any time during progress of Work. Tests, including retesting of rejected materials for installed Work, shall



be done at CONTRACTOR's expense.

## **PART 2 - PRODUCTS**

### **2.1 FORM MATERIALS**

- A. 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.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Textured Finish Concrete: Units of face design, size, arrangement, and configuration to match control sample. Provide solid backing and form supports to ensure stability of textured form liners.
- D. Forms for Cylindrical Columns and Supports: Metal, glass-fiber-reinforced plastic, or paper or fiber tubes that will produce smooth surfaces without joint indications. Provide units with sufficient wall thickness to resist wet concrete loads without deformation.
- E. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to support weight of placed concrete without deformation.
- F. Carton Forms: Biodegradable paper surface, treated for moisture-resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- G. Form Release Agent: Provide commercial formulation form release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- H. Form Ties: Factory-fabricated, adjustable-length, stainless steel, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches (38 mm) to the plane of the exposed concrete surface.
  - 1. Provide ties that, when removed, will leave holes not larger than 1 inch (25 mm) in diameter in the concrete surface. Use only stainless material.

## 2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615 Grade 60 (ASTM A 615M Grade 400), deformed.
- B. Galvanized Reinforcing Bars: ASTM A 767 (ASTM A 767M), Class II [2.0 oz. zinc psf (610 g/sq. m)], hot-dip galvanized after fabrication and bending.
- C. Epoxy-Coated Reinforcing Bars: ASTM A 775 (ASTM A 775M).
- D. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- E. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- F. Deformed-Steel Welded Wire Fabric: ASTM A 497.
- G. Epoxy-Coated Welded Wire Fabric: ASTM A 884, Class A.
- H. 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.
  - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
  - 2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

## 2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
  - 1. Use one brand of cement throughout Project.
- B. Fly Ash: ASTM C 618, Type F.
- C. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.
  - 1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that cause spalling.
  - 2. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to ENGINEER.

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- D. Lightweight Aggregates: ASTM C 330.
- E. Water: Potable.
- F. Fiber Reinforcement: Polypropylene fibers engineered and designed for secondary reinforcement of concrete slabs, complying with ASTM C 1116, Type III, not less than 3/4 inch long.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Gilco Fibers, Cormix Construction Chemicals
    - b. Durafiber, Durafiber Corp.
    - c. Fiberstrand 100, Euclid Chemical Co.
    - d. Fibermesh, Fibermesh Co., Div. Synthetic Industries, Inc.
    - e. Forta, Forta Corp.
    - f. Grace Fibers, W.R. Grace & Co.
    - g. Polystrand, Metalcrete Industries
- G. Admixtures, General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.
- H. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Air-Tite, Cormix Construction Chemicals
    - b. Air-Mix or Perma-Air, Euclid Chemical Co.
    - c. Darex AEA or Daravair, W.R. Grace & Co.
    - d. MB-VR or Micro-Air, Master Builders, Inc.
    - e. Sealtight AEA, W.R. Meadows, Inc.
    - f. Sika AER, Sika Corp.
- I. Water-Reducing Admixture: ASTM C 494, Type A.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

- a. Chemtard, ChemMasters Corp
  - b. PSI N, Cormix Construction Chemicals
  - c. Eucon WR-75, Euclid Chemical Co.
  - d. WRDA, W.R. Grace & Co.
  - e. Pozzolith Normal or Polyheed, Master Builders, Inc.
  - f. Metco W.R., Metalcrete Industries
  - g. Prokrete-N, Prokrete Industries
  - h. Plastocrete 161, Sika Corp.
- J. High-Range Water-Reducing Admixture: ASTM C 494, Type F or Type G.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Super P, Anti-Hydro Co., Inc.
    - b. Cormix 200, Cormix Construction Chemicals
    - c. Eucon 37, Euclid Chemical Co.
    - d. WRDA 19 or Daracem, W.R. Grace & Co.
    - e. Rheobuild or Polyheed, Master Builders, Inc.
    - f. Superslump, Metalcrete Industries
    - g. PSPL, Prokrete Industries
    - h. Sikament 300, Sika Corp.
- K. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Q-Set, Conspec Marketing & Manufacturing Co.
    - b. Lubricon NCA, Cormix Construction Chemicals
    - c. Accelguard 80, Euclid Chemical Co.
    - d. Daraset, W.R. Grace & Co.
    - e. Pozzutec 20, Master Builders, Inc.
    - f. Accel-Set, Metalcrete Industries
- L. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. PSI-R Plus, Cormix Construction Chemicals
    - b. Eucon Retarder 75, Euclid Chemical Co.
    - c. Daratard-17, W.R. Grace & Co.

- d. Pozzolith R, Master Builders, Inc.
- e. Protard, Prokrete Industries
- f. Plastiment, Sika Corporation

## 2.4 RELATED MATERIALS

- A. Reglets: Where sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 0.0217- inch- (0.46-mm-) thick galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized sheet steel, not less than 0.0336 inch thick (0.76 mm) with bent tab anchors. Fill slot with temporary filler or cover face opening to prevent intrusion of concrete or debris.
- C. Waterstops: Provide flat, dumbbell-type or centerbulb-type waterstops at construction joints and other joints as indicated. Size to suit joints.
- D. Rubber Waterstops: Corps of Engineers CRD-C 513.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
    - a. The Burke Co.
    - b. Progress Unlimited
    - c. Williams Products, Inc.
- E. Polyvinyl Chloride Waterstops: Corps of Engineers CRD-C 572.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
    - a. The Burke Co.
    - b. Greenstreak Plastic Products Co.
    - c. W.R. Meadows, Inc.
    - d. Progress Unlimited
    - e. Schlegel Corp.
    - f. Vinylex Corp.
- F. Sand Cushion: Clean, manufactured or natural sand.

- G. Vapor Retarder: Provide vapor retarder that is resistant to deterioration when tested according to ASTM E 154, as follows:
1. Polyethylene sheet not less than 8 mils (0.2 mm) thick.
- H. Vapor Barrier: Premolded seven-ply membrane consisting of reinforced core and carrier sheet with fortified bitumen layers, protective weathercoating, and plastic antistick sheet. Water vapor transmission rate of 1 perm when tested according to ASTM E 96, Method B. Provide manufacturer's recommended mastics and gusset tape.
1. Product: Subject to compliance with requirements, provide Sealtight Premoulded Membrane by W.R. Meadows, Inc. or approved equal.
- I. Nonslip Aggregate Finish: Provide fused aluminum oxide granules or crushed emery as the abrasive aggregate for a nonslip finish, with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide. Use material that is factory-graded, packaged, rustproof, nonglazing, and unaffected by freezing, moisture, and cleaning materials.
- J. Colored Wear-Resistant Finish: Packaged dry combination of materials consisting of portland cement, graded quartz aggregate, coloring pigments, and plasticizing admixture. Use coloring pigments that are finely ground nonfading mineral oxides interground with cement. Color as selected by OWNER from manufacturers' standards, unless otherwise indicated.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Conshake 600 Colortone, Conspec Marketing & Mfg. Co.
    - b. Floorcron, Cormix Construction Chemicals
    - c. Quartz Tuff, Dayton-Superior.
    - d. Surfex, Euclid Chemical Co.
    - e. Colorundum, A.C. Horn, Inc.
    - f. Quartz Plate, L&M Construction Chemicals, Inc.
    - g. Colorcron, Master Builders, Inc.
    - h. Floor Quartz, Metalcrete Industries
    - i. Lithochrome Color Hardener, L.M. Scofield Co.
    - j. Harcol Redi-Mix, Sonneborn-Chemrex
    - k. Hard Top, Symons Corp.
- K. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m), complying with AASHTO M 182, Class 2.

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- L. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
1. Waterproof paper
  2. Polyethylene film
  3. Polyethylene-coated burlap
- M. Liquid Membrane-Forming Curing Compound: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg/sq. m when applied at 200 sq. ft./gal (4.9 sq. m/L).
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. A-H 3 Way Sealer, Anti-Hydro Co., Inc.
    - b. Spartan-Cote, The Burke Co.
    - c. Conspec #1, Conspec Marketing & Mfg. Co.
    - d. Sealco 309, Cormix Construction Chemicals
    - e. Day-Chem Cure and Seal, Dayton Superior Corp.
    - f. Eucocure, Euclid Chemical Co.
    - g. Horn Clear Seal, A.C. Horn, Inc.
    - h. L&M Cure R, L&M Construction Chemicals, Inc.
    - i. Masterkure, Master Builders, Inc.
    - j. CS-309, W.R. Meadows, Inc.
    - k. Seal N Kure, Metalcrete Industries
    - l. Kure-N-Seal, Sonneborn-Chemrex
    - m. Stontop CS2, Stonhard, Inc.
- N. Water-Based Acrylic Membrane Curing Compound: ASTM C 309, Type I, Class B.
1. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.
  2. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Highseal, Conspec Marketing and Mfg. Co.
    - b. Sealco - VOC, Cormix Construction Chemicals
    - c. Safe Cure and Seal, Dayton Superior Corp.
    - d. Aqua-Cure, Euclid Chemical Co.
    - e. Dress & Seal WB, L&M Construction Chemicals, Inc.
    - f. Masterkure 100W, Master Builders, Inc.
    - g. Vocomp-20, W.R. Meadows, Inc.
    - h. Metcure, Metalcrete Industries
    - i. Stontop CS1, Stonhard, Inc.

- O. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Aquafilm, Conspec Marketing and Mfg. Co.
    - b. Eucobar, Euclid Chemical Co.
    - c. E-Con, L&M Construction Chemicals, Inc.
    - d. Confilm, Master Builders, Inc.
    - e. Waterhold, Metalcrete Industries
- P. Underlayment Compound: Free-flowing, self-leveling, pumpable, cement-based compound for applications from 1 inch (25 mm) thick to feathered edges.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. K-15, Ardex, Inc.
    - b. Self-Leveling Wear Topping, W.R. Bonsal Co.
    - c. Conflow, Conspec Marketing and Mfg. Co.
    - d. Corlevel, Cormix Construction Chemicals
    - e. LevelLayer II, Dayton Superior Corp.
    - f. Flo-Top, Euclid Chemical Co.
    - g. Gyp-Crete, Gyp-Crete Corp.
    - h. Levelex, L&M Construction Chemicals, Inc.
    - i. Underlayment 110, Master Builders, Inc.
    - j. Stoncrete UL1, Stonhard, Inc.
    - k. Concrete Top, Symons Corp.
    - l. Thoro Underlayment Self-Leveling, Thoro System Products
- Q. Bonding Agent: Polyvinyl acetate or acrylic base
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Polyvinyl Acetate (Interior Only):
      - 1) Superior Concrete Bonder, Dayton Superior Corp.
      - 2) Euco Weld, Euclid Chemical Co.
      - 3) Weld-Crete, Larsen Products Corp.
      - 4) Everweld, L&M Construction Chemicals, Inc.



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- 5) Herculox, Metalcrete Industries
  - 6) Ready Bond, Symons Corp.
- b. Acrylic or Styrene Butadiene:
- 1) Acrylic Bondcrete, The Burke Co.
  - 2) Strongbond, Conspec Marketing and Mfg. Co.
  - 3) Day-Chem Ad Bond, Dayton Superior Corp.
  - 4) SBR Latex, Euclid Chemical Co.
  - 5) Daraweld C, W.R. Grace & Co.
  - 6) Hornweld, A.C. Horn, Inc.
  - 7) Everbond, L&M Construction Chemicals, Inc.
  - 8) Acryl-Set, Master Builders Inc.
  - 9) Intralok, W.R. Meadows, Inc.
  - 10) Acrylpave, Metalcrete Industries
  - 11) Sonocrete, Sonneborn-Chemrex
  - 12) Stonlock LB2, Stonhard, Inc.
  - 13) Strong Bond, Symons Corp.
- R. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Burke Epoxy M.V., The Burke Co.
    - b. Spec-Bond 100, Conspec Marketing and Mfg. Co.
    - c. Resi-Bond (J-58), Dayton Superior.
    - d. Euco Epoxy System #452 or #620, Euclid Chemical Co.
    - e. Epoxite Binder 2390, A.C. Horn, Inc.
    - f. Epabond, L&M Construction Chemicals, Inc.
    - g. Concreative Standard Liquid, Master Builders, Inc.
    - h. Rezi-Weld 1000, W.R. Meadows, Inc.
    - i. Metco Hi-Mod Epoxy, Metalcrete Industries
    - j. Sikadur 32 Hi-Mod, Sika Corp.
    - k. Stonset LV5, Stonhard, Inc.
    - l. R-600 Series, Symons Corp.

## 2.5 PROPORTIONING AND DESIGNING MIXES

- A. 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 designs.

1. Do not use the same testing agency for field quality control testing.
  2. Limit use of fly ash to not exceed 25 percent of cement content by weight.
- B. Submit written reports to ENGINEER of each proposed mix for each class of concrete prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed.
- C. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:
1. 4000 psi (27.6 MPa), 28-day compressive strength; water-cement ratio, 0.44 maximum (non-air-entrained), 0.35 maximum (air-entrained).
- D. 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 deicers/watertight: W/C 0.40.
  3. Subjected to brackish water, salt spray, or deicers: W/C 0.40.
- E. 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 3 inches (75 mm).
  2. Reinforced foundation systems: Not less than 1 inch (25 mm) and not more than 3 inches (75 mm).
  3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches (200 mm) after adding admixture to site-verified 2 - 3 inch (50 - 75 mm) slump concrete.
  4. Other concrete: Not more than 4 inches (100 mm).
- F. Lightweight Structural Concrete: Lightweight aggregate and concrete shall conform to ASTM C 330. Proportion mix to produce concrete with a minimum compressive strength of 3000 psi (20.7) at 28 days and a calculated equilibrium unit weight of 110 pcf (1762 kg/cu. m) plus or minus 3 pcf (48.1 kg/cu. m) as determined by ASTM C 567. Concrete slump at the point of placement shall be the minimum necessary for efficient mixing, placing, and finishing. Maximum slump shall be 6 inches (150 mm) for pumped concrete and 5 inches (125 mm) elsewhere. Air entrain concrete exposed to weather according to ACI 301 requirements.

- 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 ENGINEER. Laboratory test data for revised mix design and strength results must be submitted to and accepted by ENGINEER before using in Work.
- H. Fiber Reinforcement: Add at manufacturer's recommended rate but not less than 1.5 lb/cu. yd. (0.9 kg/cu. m).

## 2.6 ADMIXTURES

- A. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
- B. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F (10 deg C).
- C. Use high-range water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water-cement ratios below 0.50.
- D. 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 minus 1-1/2 percent within the following limits:
  - 1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure:
    - a. 4.5 percent (moderate exposure); 5.5 percent (severe exposure) for 1-1/2 inch (38 mm) maximum aggregate.
    - b. 4.5 percent (moderate exposure); 6.0 percent (severe exposure) for 1 inch (25 mm) maximum aggregate.
    - c. 5.0 percent (moderate exposure); 6.0 percent (severe exposure) for 3/4 inch (19 mm) maximum aggregate.
    - d. 5.5 percent (moderate exposure); 7.0 percent (severe exposure) for 1/2 inch (13 mm) maximum aggregate.
  - 2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.
- E. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

## **2.7 CONCRETE MIXING**

- A. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.
  - 1. When air temperature is between 85 deg F (29 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.

### **3.2 FORMS**

- A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:
  - 1. Provide Class A tolerances for concrete surfaces exposed to view
  - 2. Provide Class C tolerances for other concrete surfaces
- B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.
- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.

- D. Provide temporary openings for clean-outs and inspections where interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

### **3.3 VAPOR RETARDER/BARRIER INSTALLATION**

- A. General: Place vapor retarder/barrier sheeting in position with longest dimension parallel with direction of pour.
- B. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended mastic or pressure-sensitive tape.
  - 1. Cover vapor retarder/barrier with sand cushion and compact to depth indicated.

### **3.4 PLACING REINFORCEMENT**

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as specified.
  - 1. Avoiding cutting or puncturing vapor retarder/barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved.

- D. Place reinforcement to maintain minimum coverages as indicated for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

### **3.5 JOINTS**

- A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure.
- B. Provide keyways at least 1-1/2 inches (38 mm) deep in construction joints in walls and slabs and between walls and footings. Bulkheads designed and accepted for this purpose may be used for slabs.
- C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.
- D. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- E. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's printed instructions.
- F. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
- G. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch (3 mm) wide by one-fourth of slab depth or inserts 1/4 inch (6 mm) wide by one-fourth of slab depth, unless otherwise indicated.
  - 1. Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.

2. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
3. If joint pattern is not shown, provide joints not exceeding 15 ft. (4.5 m) in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
4. Provide joint fillers and sealants.

### **3.6 INSTALLING EMBEDDED ITEMS**

- A. General: Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.
- B. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
- C. Install dovetail anchor slots in concrete structures as indicated on drawings.
- D. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

### **3.7 PREPARING FORM SURFACES**

- A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.
- B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.
  1. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

### **3.8 CONCRETE PLACEMENT**

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified.

- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.
  
- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches (600 mm) and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
  - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
  - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.
  
- E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.
  - 1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
  - 2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
  - 3. Maintain reinforcing in proper position on chairs during concrete placement.
  
- F. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  
- G. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
  - 1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.



2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- H. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F (32 deg C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is CONTRACTOR's option.
  2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
  3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
  4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions.

### **3.9 FINISHING FORMED SURFACES**

- A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch (6 mm) in height rubbed down or chipped off.
- B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.
- C. Smooth-Rubbed Finish: Unless otherwise shown or scheduled, provide smooth-rubbed finish on all exposed, vertical concrete surfaces that have received smooth-formed finish treatment not later than 1 day after form removal.
1. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

- D. Grout-Cleaned Finish: Provide grout-cleaned finish on scheduled concrete surfaces that have received smooth-formed finish treatment.
  - 1. Combine one part portland cement to one and one-half parts fine sand by volume, and a 50:50 mixture of acrylic or styrene butadiene-based bonding admixture and water to form the consistency of thick paint. Blend standard portland cement and white portland cement in amounts determined by trial patches so that final color of dry grout will match adjacent surfaces.
  - 2. Thoroughly wet concrete surfaces, apply grout to coat surfaces, and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.
  
- E. 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.

### **3.10 MONOLITHIC SLAB FINISHES**

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and where indicated.
  - 1. After placing slabs, finish surface to tolerances of F (F) 15 (floor flatness) and F (L) 13 (floor levelness) measured according to ASTM E 1155 (ASTM E 1155M). Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.
  
- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and where indicated.
  - 1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F(F) 18 (floor flatness) and F(L) 15 (floor levelness) measured according to ASTM E 1155 (ASTM E 1155M). Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

- C. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or another thin film-finish coating system.
  - 1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155 (ASTM E 1155M). Grind smooth any surface defects that would telegraph through applied floor covering system.
- D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply a trowel finish as specified, then immediately follow by slightly scarifying the surface with a fine broom.
- E. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
  - 1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with before application.
- F. Nonslip Aggregate Finish: Apply nonslip aggregate finish to concrete stair treads, platforms, ramps, sloped walks, and where indicated.
  - 1. After completing float finishing and before starting trowel finish, uniformly spread dampened nonslip aggregate at a rate of 25 lb per 100 sq. ft. (12 kg/10 sq. m) of surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface. After broadcasting and tamping, apply trowel finishing as specified.
  - 2. After curing, lightly work surface with a steel wire brush or an abrasive stone, and water to expose nonslip aggregate.

### **3.11 MISCELLANEOUS CONCRETE ITEMS**

- A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

- C. **Equipment Bases and Foundations:** Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.
- D. **Steel Pan Stairs:** Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and trowel-finish concrete surfaces.

### **3.12 CONCRETE CURING AND PROTECTION**

- A. **General:** Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. **Curing Methods:** Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified.
- D. Provide moisture curing by the following methods:
  - 1. Keep concrete surface continuously wet by covering with water.
  - 2. Use continuous water-fog spray.
  - 3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4 inch (100 mm) lap over adjacent absorptive covers.
- E. Provide moisture-retaining cover curing as follows:
  - 1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches (75 mm) and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- F. Apply curing compound on exposed interior slabs and on exterior slabs, walks, and curbs as follows:

1. Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
  2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
- G. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- H. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by applying the appropriate curing method.
1. Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.

### **3.13 SHORES AND SUPPORTS**

- A. General: Comply with ACI 347 for shoring and reshoring in multistory construction, and as specified.
- B. Extend shoring from ground to roof for structures four stories or less, unless otherwise permitted.
- C. Extend shoring at least three floors under floor or roof being placed for structures over four stories. Shore floor directly under floor or roof being placed, so that loads from construction above will transfer directly to these shores. Space shoring in stories below this level in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members where no reinforcing steel is provided. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.
- D. Remove shores and reshore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to support work without excessive stress or deflection.

- E. Keep reshores in place a minimum of 15 days after placing upper tier, or longer, if required, until concrete has attained its required 28-day strength and heavy loads due to construction operations have been removed.

### **3.14 REMOVING FORMS**

- A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.
- C. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

### **3.15 REUSING FORMS**

- A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use patched forms for exposed concrete surfaces except as acceptable.

### **3.16 CONCRETE SURFACE REPAIRS**

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable.
- B. Mix dry-pack mortar, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh (1.2 mm) sieve, using only enough water as required for handling and placing.
  - 1. Cut out honeycombs, rock pockets, voids over 1/4 inch (6 mm) in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth

less than 1 inch (25 mm). Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.

2. For surfaces exposed to view, blend white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- C. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of OWNER. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with bonding agent.
1. Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.
1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to the reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.
  2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
  3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable.

4. Repair defective areas, except random cracks and single holes not exceeding 1 inch (25 mm) in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4 inch (19 mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- E. Repair isolated random cracks and single holes 1 inch (25 mm) or less in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Place dry-pack before bonding agent has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- F. Perform structural repairs with prior approval of ENGINEER for method and procedure, using specified epoxy adhesive and mortar.
- G. Repair methods not specified above may be used, subject to acceptance of ENGINEER.

### **3.17 QUALITY CONTROL TESTING DURING CONSTRUCTION**

- A. General: The CONTRACTOR will employ a testing agency to perform tests and to submit test reports, at no additional cost to the OWNER.
- B. Sampling and testing for quality control during concrete placement may include the following, as directed by ENGINEER.
  1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
    - a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
    - b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
    - c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.



- d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
  - e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. (4 cu. m) plus additional sets for each 50 cu. yd. (38 cu. m) more than the first 25 cu. yd. (19 cu. m) of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
  3. When total quantity of a given class of concrete is less than 50 cu. yd. (38 cu. m), ENGINEER may waive strength testing if adequate evidence of satisfactory strength is provided.
  4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
  5. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi (3.4 MPa).
- C. Test results will be reported in writing to ENGINEER within 3 days. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
- D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- E. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

END OF SECTION



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**SECTION 03310**  
**FLOWABLE FILL CONCRETE**

**PART 1 GENERAL**

**1.1 DESCRIPTION**

Flowable fill is a low strength mixture of portland cement, sand, Class F fly ash, and water. It is proportioned to flow under and around the pipe requiring no compaction and little or no finishing. Flowable fill may be used by the CONTRACTOR as backfill material for pipe. When using flowable fill with aluminum pipe, an approved means of separation must be provided, such as bituminous coating.

All flowable fill shall conform to the latest edition of the Kentucky Transportation Cabinet standard specifications and drawings.

**PART 2 PRODUCT**

**2.2 MATERIALS**

Ingredient materials shall meet the requirements specified in the following sections of the Standard Specifications:

Portland Cement, Type I	801
Sand	804
Fly Ash, Class F	844
Water	803

The flowable fill shall be initially mixed in the following proportions per cubic yard:

Cement (Minimum)	40 lbs.
Fly Ash	300 lbs.
Sand (SSD)	3000 lbs.
Water (Maximum)	550 lbs.

To expedite settlement of the flowable fill it will be necessary for bleed water to appear on the surface within 5 to 10 minutes after placement. A delay in bleeding indicates there are too many fines in the mixture or insufficient water. If the maximum water was added, the fly ash quantity shall be reduced in increments of 50 lbs. until mixture is bleeding freely. Approximately 60 lbs. of sand shall be added to replace each 50 lbs. increment of fly ash to maintain the original yield. The flowable fill is too dry when

cracks develop as it flows into place.

A set of test cylinders shall be cast for each 300 cubic yards of flowable fill. Cylinders shall not be rodded, but the sides of the mold shall be tapped lightly after each layer. The test cylinders should be allowed to bleed for about 30 minutes, refilled, and then covered with a sheet of tough durable impervious plastic. Secure the plastic in place around the mold, within one inch of the top, with a rubber band or string prior to covering with wet burlap. Remove the burlap after 24 hours and cure at 60°F to 90°F, in the shade, until 28 days old. Then remove the plastic covering and mold and perform compressive strength test. The average of the 28 days compressive strength tests is expected to be approximately 50 PSI.

## **PART 3 EXECUTION**

### **3.3 CONSTRUCTION**

Flowable fill shall be delivered in a revolving drum truck mixer conforming to Section 601 to insure that the mixture is in suspension when placed. Agitation is required during transportation and waiting time. Subsidence may occur if the mixture is not agitated. Normally, a trench can be backfilled directly from the truck chute or a pump may be used.

The flowable fill may extend from the top of the compacted bedding to the bottom of the pavement structure. Flowable fill shall be a minimum of 2 hours of age prior to the addition and compaction of any material above it.

When flowable fill is used, the CONTRACTOR may reduce the trench width to a minimum of 6 inches clear on each side of the pipe. Standing water in the trench does not have to be pumped out before backfilling with flowable fill.

Certain types of pipe may float, therefore backfilling may have to be done in lifts or else the pipe will need to be anchored. Backfilling in lifts is generally more applicable to long lines of pipe, allowing time for a substantial amount of the water to dissipate prior to applying the next lift. Anchors can be made of small lumber, metal straps, and must be adequately spaced. For larger diameter pipe, it may be possible to maintain a surge of flowable fill on top of the pipe to help prevent floating. Generally floating is not a problem after the level of the backfill is above the springline of the pipe. The CONTRACTOR is responsible to take whatever action is necessary to insure that the pipe remains in the correct horizontal position and at the specified elevation.

END OF SECTION

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**SECTION 11200**  
**Booster Pump Station**

**PART 1      GENERAL**

**1.1      SCOPE**

The CONTRACTOR shall furnish and install one (1) - factory built, factory delivered, below ground water booster pump station in a steel welded capsule with all necessary internal piping, valves, fittings, supports, meters, pumps, motors, controls, manual transfer switch and other necessary appurtenances as shown on the plans and specified herein.

The booster pump station shall be complete when delivered and will not require internal CONTRACTOR construction except to install the power service through the service conduit provided for that purpose, install the telemetry panel and to connect the main water service to the required points and other work as may be listed in the Section for CONTRACTORS INSTALLATION REQUIREMENTS.

**1.2      INSTALLATION REQUIREMENTS**

The CONTRACTOR shall be required to set the station on the foundation designed by the ENGINEER shown in the plan set. The foundation shall be built by the CONTRACTOR and as directed by the ENGINEER. Following setting of the station, the CONTRACTOR will be required to anchor the station to the foundation, backfill around the station and install the anodes as shown on the plans sheets. The CONTRACTOR shall supply the anchor bolts.

**1.3      CONTRACTORS RECOGNITION OF A VALID EQUIPMENT PROPOSAL**

To avoid a displacing of responsibility, the Pumping Station manufacturer alone shall propose to CONTRACTORS on the assembled equipment covered by this section of these contract documents. Said manufacturer's proposal must be signed by an officer of the manufacturing company.

**1.4      MANUFACTURER'S RESPONSIBILITY FOR PERFORMANCE**

The Specifications and Drawings for the Factory-built equipment do not necessarily include all the details for the design and fabrication for the factory-built equipment. The Drawings are generally schematic but the specifications do call out strict requirements to known methods, components and assemblies that must be in a full, complete and functional pumping station. As such, the Manufacturer shall accept and hold complete responsibility for the functionality of the pump station and its workings.

### **1.5 BASIS OF DESIGN MANUFACTURER**

The BASIS OF DESIGN station equipment is by Engineered Fluid, Inc. (EFI) having been deemed to represent the minimum level of quality, performance and service acceptable for this equipment. Engineered Fluid, Inc. is represented by Mr. Jason Bivins of Delaney & Associates, Inc., telephone 859-342-4944.

The OWNER's water system is maintained and operated by independent contractors shared also by the Jessamine-South Elkhorn Water District. Both water systems have standardized around Engineered Fluid, Inc. pump stations and are familiar with the operations and maintenance of EFI stations, products, materials and service providers.

In order to maintain system uniformity throughout the water service area, alternate pump station manufacturers are strongly discouraged for submittal of Bids for this project.

### **1.6 ALTERNATE MANUFACTURERS**

Alternate manufacturers may propose on the equipment set forth in these documents provided these alternate manufacturers take no exceptions to the contract documents and these manufacturers provide the PRE-BID SUBMITTAL information so listed in this specification.

Alternate manufacturers are eligible to provide CONTRACTOR proposals for this equipment. However, these listed manufacturers must have provided a PRE-BID SUBMITTAL to the ENGINEER of Record at least ten (10) days prior to the bid date.

### **1.7 PRE-BID SUBMITTAL DOCUMENTS**

Along with the requirements for post bid submittal documents provided for elsewhere in these documents, all alternate manufacturers offering equipment proposals, without exception, for this equipment shall provide at least ten (10) days before the bid date the below-listed PRE-BID SUBMITTAL documents for the pump station and containing at a minimum:

1. "D" sized only, station mechanical drawing sheets fully to scale and fully annotated showing;
  - a. A PLAN VIEW of all mechanical equipment, piping and devices necessary to system operation and with NEC Electrical Clearances;
  - b. A lengthwise SECTION VIEW;
  - c. A Sidewise SECTION VIEW;
  - d. A complete STRUCTURAL PLAN VIEW of the steel base for the pump

stations.

2. "D" sized only sheets showing;
  - a. A POWER ONE LINE DIAGRAM annotated and showing all power components;
  - b. A PROCESS & INSTRUMENTATION DIAGRAM (P&ID) showing all components, devices and circuit for the controls and instrumentation for the control and monitoring equipment including the PLC equipment.
3. A detailed drawing of the tank to be used to house the station including anchoring and assembly methods.
4. An affidavit signed by an officer of the station manufacturer attesting to the fact that the buried capsule shall be constructed with the specified lap seam joint for joining the side sheet to the top sheet and bottom sheets of the capsule.

PRE-BID SUBMITTAL documents will not be accepted after the date set so it is the Bidding CONTRACTORS responsibility to determine which of the listed manufacturers have turned in their PRE-BID SUBMITTAL documents.

The ENGINEER shall review the PRE-BID SUBMITTALS for adherence to the contract documents.

The PRE-BID SUBMITTAL shall be provided in two (2) hard paper copy bound in a three ring binder with a Table of Contents and tabs for each individual pump station and with one (1) electronic copy on CD placed inside the three ring binder in a suitable pocket.

The manufacturers that are approved for proposing on the specified equipment, the approval of their PRE-BID SUBMITTAL in no way excuses them from providing a full set of submittal documents being in full conformance to the contract documents for detailed review by the ENGINEER post bid.

## **1.8 POST BID SUBMITTAL**

Equipment submittals shall be bound and in a minimum of four (4) hard paper copy bound and two (2) electronic copies on CD. The submittals shall contain a minimum of two (2) full size drawings, size 24" x 36"; one (1) each covering the booster pump station and the electrical control schematic. The booster pump station drawing shall be specific to this project, in at least three (3) different views, be to scale and illustrate the National Electrical Code (NEC) clearances per Section 110-26 of the Code. The submittal booklets will be complete with data sheets covering all major components that make up the booster pump

station and the UL/ETL file number under which the manufacturer is listed, service department personnel statement as detailed in the specifications and be complete with the manufacturer's formal warranty policy. **The submittal booklets shall be complete with a full size photocopy of the manufacturer's combination UL/manufacturer logo Packaged Pumping Systems label.**

Two (2) submittal reviews of this item will be accomplished at no cost to the submitting CONTRACTOR. However, all subsequent reviews will be charged to the submitting CONTRACTOR at the ENGINEER's standard hourly billing rate.

### **1.9 QUALITY ASSURANCE**

The equipment furnished shall be designed, constructed, and installed in accordance with the best practices and methods and shall operate satisfactorily when installed as shown on the contract drawings and operated per manufacturer's recommendations.

### **1.10 THIRD PARTY INSPECTION LISTING (STATIONS 600V MAX.)**

The station manufacturer shall be required to affix to the station an UNDERWRITERS LABORATORIES (UL) LABEL attesting to the compliance of the station equipment under the PACKAGED PUMPING SYSTEMS (QCZJ) UL Listing Category and/or INTERTEK TESTING SERVICES (ETL) LABEL attesting to the compliance of the station equipment under PACKAGED PUMPING SYSTEMS. The ETL label shall state the station conforms to UL STD 778 and is certified to CAN/CSA STD C22.2 NO. 108.

### **1.11 FACTORY ACCEPTANCE TEST**

At such a time as the station is complete in the factory but prior to final testing and shipment, the ENGINEER and OWNER shall be given a two (2) week notice of this testing date. The ENGINEER and/or OWNER shall be present to view the station and final testing so as to review the station for conformance to the contract drawings and specifications.

Any deficiencies noted during this Acceptance testing shall be rectified during the visit where possible. Those deficiencies not correctable during the visit shall be noted and rectified within seven (7) working days and a notice of such rectification shall be forwarded to the ENGINEER signed by the Quality Assurance Manager and an officer of the station manufacturer.



### **1.12 SHIPPING AND DELIVERY**

The specified equipment shall be delivered by the manufacturer FOB DESTINATION and thereby the station manufacturer shall hold the full responsibility for the condition and completeness of the equipment upon its delivery.

If the manufacturer ships the pump station to the jobsite using a contract carrier, the manufacturer shall provide to the CONTRACTOR, OWNER and ENGINEER an insurance policy specifically covering the shipment of the station to the jobsite, said policy to ensure the station to be free of damage or adverse effects of the transportation. The face value of the policy shall be the sale value of the pump station

The ENGINEER shall hold the right to inspect the equipment prior to unloading and setting so as to assure the quality and condition of the equipment is in no way deficient.

If in the view of the OWNER, ENGINEER or his representative, the equipment is deficient when delivered, delivery shall be refused.

### **1.13 SPECIFIED COMPONENTS**

Within the body of this specification and on the drawings, certain components are listed by name and/or model number for at least one (1) manufacturer's specific product. As such, no "OR EQUAL" is listed or allowed where at least the one manufacturer is listed.

These listed components have been chosen because of the ENGINEER's and OWNER's knowledge of and experience with these listed components.

No other components other than those listed are acceptable.

### **1.14 FACTORY START-UP AND TRAINING SERVICE**

Without exception, the station manufacturer is directly responsible for station start-up and operator training. Third party contractors, agents or representatives are not to be allowed to start up the station nor the equipment therein. As such;

1. Start-up Factory Service Technician shall be a regular employee of the station manufacturer.
2. The manufacturer shall provide two (2) copies of the complete Operation & Maintenance Manual in hard copy paper format and one (1) in electronic form.

### **1.15 FACTORY AUTHORIZED SERVICE**

The manufacturer shall have, within 300 miles of the installation, an authorized service provider trained by the manufacturer and provided with a full set of Operation & Maintenance Manuals for this specific equipment.

The Authorized Service provider and their location shall be made known as a part of the submittal.

### **1.16 MANUFACTURER'S WARRANTY**

The warranty is the sole responsibility of the station manufacturer and that manufacturer's warranty shall be provided in written form, being placed in both the Submittal documents covering the specified equipment and the O&M manuals provided with that equipment.

It is required the station warranty provide the OWNER with a single source responsibility for all components specified herein and the system as a whole. That single source shall be none other than the station manufacturer. Third party suppliers, service contractors, "Pass-through" warranties and service by the representative are not acceptable.

Said manufacturer's warranty shall at a minimum cover:

1. A period of one (1) year commencing upon successful start-up, after authorized manufacturer's start-up, not to exceed eighteen (18) months from the date of shipment.
2. The warranty period shall be inviolate regardless of any component manufacturer's warranty for equipment and components within the station.
3. The manufacturer's warranty shall cover all equipment, components and systems provided in or with the station by the manufacturer of the station, exclusive of those components supplied by and/or installed by others independent of the manufacturer of record for this station.
4. The warranty shall provide for the station manufacturer to bear the full cost of labor and materials for replacement and/or repair of faulty or defective components so there shall be no cost incurred by the OWNER for this work during the warranty period.

5. The manufacturer's warranty policy is amended only by the items considered consumable, i.e., light bulbs, pump seals, pump packing, lubricants and other maintenance items consumed by usage.
6. No assumption of contingent liabilities for any component failure during manufacturer's warranty is made.
7. The warranty pertains only where the equipment has been operated in strict accordance with the manufacturer's instructions and requirements. Evidence of misuse or modification to the equipment voids the warranty.

If the submitted written manufacturer's warranty does not meet the minimum requirements set forth above, that submittal will forthrightly be rejected.

#### **1.17 GENERAL LIABILITY INSURANCE**

The water distribution station manufacturer shall furnish premises/operations and products/completed operations general liability insurance from an insurance company with a rating of A-V according to the most recent Best's Key Rating Guide, in an amount equal to \$10,000,000 per occurrence.

The insurance certificate must be included with the manufacturer's submittal. The coverage must be provided by an insurance carrier licensed and admitted in the state of manufacture.

### **PART 2 PRODUCTS AND COMPONENTS**

#### **2.1 EQUIPMENT CAPSULE DESIGN STANDARDS**

The equipment capsule shown is suitable by construction and materials for direct burial with water-tight integrity.

The size shown for the capsule is appropriate for National Standard mandated clearances and for proper clearances above, below and around equipment to provide for safe servicing, removal and reinstallation of that equipment.

The entrance man way in the location shown shall be sized to provide eventual removal and replacement of any component within the station without altering the station to accomplish that task.

The drawings for this equipment illustrate equipment centerline and clearance/maintenance dimensions about the major equipment items. These dimensions are minimum.

## **2.2 EQUIPMENT CAPSULE - CONSTRUCTION**

The plate steel employed throughout the capsules shall be 1/4" as minimum thickness and meet or exceed the requirements for ASTM A-36.

The structural shapes, channels and angles used shall be of the thickness/weight as shown on the plans for this item and shall meet or exceed the requirements for ASTM A-36.

The side sheet, if pieced, shall have only vertical piecing seams and no horizontal piecing seams.

The end sheets for tanks of 96" diameter or less, if pieced shall be made up of no more than three (3) pieces.

Piecing seam welds shall be only full penetration, double sided butt welds. The piecing seam welds shall ground smooth both inside and outside the capsule.

## **2.3 CAPSULE DIMENSIONS**

The capsule shall be a rolled end and elongated steel capsule of sealed welded construction with top and bottom and side sheets and with appropriate supporting structure.

The capsule shall be sized as shown on the drawings.

## **2.4 CAPSULE REINFORCEMENT**

The top, bottom and sides of the equipment capsules shall be supported and reinforced by a combination of standard structural shapes of the sizes and weights as shown on the plans for this item.

The structural rectangular or square tubing shall be of the wall gauge as shown on the plans for this item and shall meet or exceed the requirements for ASTM A-500 Grade.

## **2.5 PLATE/SHEET CAPSULE JOINTS – LAP SEAM WELD**

The construction of the capsule as a buried system requires construction techniques necessary to ensure a long service life. The side sheet – top sheet joint construction is specified to provide maximum coating effectiveness and minimal corrosion potential by the elimination of sharp edges or abrupt transitions where coating process cannot maintain full film thickness and so promote corrosion and undercutting.

The plate forming the top and bottom of the capsules shall be rolled edge, cold formed prior to assembly so as to form a lap joint with the side wall.

The lap joint shall be continuously full fillet welded on the capsule interior by hand and the exterior by machine to form an airtight seal.

The lower side wall continuous weld shall be an average 1-1/2 inches above the capsule floor. Capsules without lap joints will not be accepted.

The lap joint shall be in full conformance with Steel Tank Institute (STI) P-3 specifications Section 4.2.6 and Underwriters Laboratories (UL) 58 Construction Section 6, Figure 6.1 Head Joint #23 specifications for steel vessels in buried service.

## **2.6 CAPSULE PRESSURE TEST**

Each capsule shall be constructed complete as a closed vessel with fittings as required for testing the air-tight integrity of the capsule.

The capsule shall be tested according to UL-142, Performance Test Methods, 39, Tank Leakage Test, 39.2, Primary Containment Tanks.

## **2.7 TANK SHEET PENETRATION WELDS**

Any ferrous metal device, namely water transmission piping and conduits passing through the capsule wall shall be welded fully long its circumference or length, being welded on both sides of the capsule wall using a metal-added, MIG shielded arc welding process.

## **2.8 LIFTING PLATES AND EQUIPMENT LIFTING EYES**

Six (6) lifting plates of 3/8 inch minimum thickness shall be placed about the perimeter of each capsule to facilitate the lifting and handling of the station.

Interior lifting eyes shall be placed over each piece of equipment in excess of 60 pounds in weight.

## **2.9 FLOOR SUMP**

The capsule shall be complete with a sump. The sump shall be a minimum of eighteen (18) inches in diameter x eight (8) inches deep; the sump shall be provided with a four (4") inch plugged outlet for gravity outflow as required.

## **2.10 ENTRANCE MAN-WAYS - RAISED MOUNTED SCUTTLES**

The entrance man-ways shall be Bilco Model MNB-50 roof scuttle, with a minimum clear inside opening of thirty (30) inches by fifty-four (54") inches

The scuttle covers shall be made of 11 gauge aluminum on the exterior. The scuttle covers shall be insulated with a minimum of one (1) inch of fiberglass insulation, covered and protected by an 18 gauge aluminum liner.

The entry locks shall be flush mounted, in the scuttle riser in position to be protected from the elements by the cover skirt as detailed on Bilco Drawing 6184. The locks will be of the pin tumbler type, dead bolt, with an inside safety release. Two (2) keys will be provided for each station, on a key ring complete with the manufacturer's identification. No locking devices or other penetrations of the cover shall be allowed.

The hatch shall be bolted to a hatch extension of the capsule. Bolted connection should stay above the surface of the finished grade to allow changing out the hatch. Non-shrink closed cell foam gasket shall be used to make positive seal between the top of the hatch extension and the bottom flange on the hatch.

## **2.11 ACCESS LADDER**

An all aluminum access ladder will be provided for each station. The ladders shall be a Type 1A with 300 lbs. load rating and meet ANSI A14.3 fixed ladder standard. The ladders will have serrated rungs with 3" full I-Beam side rails.

The uppermost ends of the side rails will be protected by plastic caps bolted into place. The complete access ladder will be bolted into place at a minimum of two (2) points both top and bottom so as to be easily removable to facilitate equipment maintenance.

## **2.12 LADDER ASSIST DEVICE**

A Bilco Model LU-1 ladder-up safety post shall be installed on the vertical centerline of each ladder.

### **2.13 CAPSULE CATHODIC PROTECTION**

The station manufacturer shall furnish for the CONTRACTOR's proper installation four (4) seventeen pound packaged magnesium anodes for cathodic protection.

The anodes shall be H-1 alloy cast to meet ASTM B-80, alloy AZ-63. The anode lead wires shall be silver soldered and potted to be waterproof.

The anodes shall be buried equally spaced around the station and connected by heavy copper wire to lugs on the station provided for that purpose.

### **2.14 SAFETY FLOOR MATTING**

The walkway areas (that space from the entrance ladder to the control panel and the entire NEC clearance area) shall be covered with a rubber drainage runner. The runner shall be medium duty, 1/2 inch minimum thickness of open slot design allowing fluids to drain understanding or walking surfaces. The runner shall have a tread design to promote sure footing. The underside of the runner shall have a raise knob design to permit aeration and drainage, and to reduce runner fatigue. The runner shall not be glued to the floor.

### **2.15 PUMP OPERATING CONDITIONS - PUMP STATION**

The pump station shall be capable of delivering the fluid medium at the following capacities and heads when operating at 0 feet minimum suction pressure.

PUMPS #1 & #2

The pumps shall be Close Coupled End Suction by Cornell model 4WH.

Design Point: 600 GPM @ 139 feet TDH;

NPSHr: 13.7 feet;

Pump Efficiency at Design Point: 75.2%

Pump Power: Non-overloading for 40 rated hp

Motor Speed: 3600 rpm nominal

### **2.16 PUMPS – CLOSE COUPLED HORIZONTAL END SUCTION, CENTRIFUGAL**

The pumps employed within the pump station shall be of the close coupled, horizontal end suction, centrifugal configuration.

The pumps shall be of close grain cast iron construction complete with bronze trim. The pumps shall conform to the detailed specifications as set forth below:

The pumps shall be Volute style with the pump casing bolted to adapter, with recessed lock fit to insure alignment. No stud or bolt holes are tapped through casing to liquid ways. Tapping openings provided for priming, venting, draining and suction and discharge gauge connections. Piping connection are to be as shown on the pump data sheets.

Impellers are to be single suction type, cast in one piece. All impellers are to be statically balanced to insure smooth operation, also hydraulically balanced except in some small sizes where end thrust is but a minor factor.

Wearing rings shall be renewable, be set on both the impeller and body and be set to maintain proper running clearance with impeller hubs to minimize leakage between the suction and discharge.

Shaft sleeves shall be shouldered onto the shaft near impeller to cover the full length of shaft from impeller hub to motor end bracket by being in compression over the shaft, protecting shaft from contact with liquid.

The stuffing box shall be cast integral with the pump casing. The stuffing box shall contain a single face type mechanical seal. The seal shall have a carbon rotating head against a Ni-Resist stationary face and be complete with a Buna-N boot with stainless steel spring and spring retainer.

The motor adaptor shall maintain a rigid, bolted, registered assembly between motor and the casing by a machined lock between adapter and motor end bracket keeping the adapter and casing in permanent alignment with motor and motor shaft.

Motor configuration shall be as a close-coupled assembled as an integral part of the complete units. The extended motor shaft carries the impeller and shaft sleeve. Motor bearings are ball bearing type, designed to carry all radial and thrust loads, and are installed in sealed housings which retain lubricant and exclude dirt and moisture.

## **2.17 PUMP/MOTOR VIBRATION ISOLATION PADS**

The pump/motor assembly shall be mounted to a fabricated steel base built specifically for the pump/motor to be mounted. Each mounting or attachment point shall be complete with a vibration isolation pad. The pad will be in two (2) parts, a 1/4" base layer followed by a 5/8" upper layer and be a nominal 2" x 2" square size for pump/motor combinations weighing up to 1500 pounds.



## **2.18 PUMP SUPPORT STANDS**

The pump support stands shall be weld fabricated of structural and plate steel with double "H" configuration of solid, continuous legs and double webbing between the legs for rigidity. The base of the legs shall be flanged and continuously welded to the steel floor. The upper end of the legs shall be flanged and continuously welded to a 3/8" thick pump motor leg bolt-down plate.

## **2.19 PUMP MOTOR CONFIGURATION**

The pump driver shall be a NEMA Design B, three phase, alternating current, (squirrel cage) induction motor, continuous duty rated, with motor insulation as Class F for Class B Heat Rise.

Motor efficiencies shall be Premium Efficient as stated in NEMA MG 1, 2011 Part 12, Table 12-12 for the motor enclosure, open or closed.

Motor Service factor shall be 1.15 on the nameplate, reduced to 1.0 when used with variable frequency drives per NEMA MG 1 – 2011, Part 31.3.7.

The motor enclosure shall be Open Drip Proof (ODP), enclosure.

Motors of 600 volts or less shall meet the requirements of NEMA MG 1 2011 Part 31.4.4.2 for ability to sustain voltage spikes when used with variable frequency drives under usual conditions

These motors are for use with variable frequency drives.

## **2.20 PIPING-TRANSMISSION**

Piping shall be steel and conform to material specification ASTM A-53(CW) for nominal pipe size four (4) inch and smaller and ASTM A-53(ERW) Grade B for nominal pipe size five (5) inches and larger. Steel butt-welding fittings shall conform to material specification ASTM A-234 Grade WPB and to the dimensions and tolerances of ANSI Standards B16.9 and B16.28 respectively.

Forged steel flanges shall conform to material specification ASTM A-105 Class 60 and/or ASTM A-181 for carbon steel forgings and to the dimensions and tolerances of ANSI Standards B16.5 as amended in 1992 for Class 150 and Class 300 flanges.

The piping sizes shall be as shown on the drawing.

Size 10 inch and below - Schedule 40

Size 12 inch thru 20 inch - Standard weight (.375" wall)

Size 24 inch and above - Standard weight (.500" wall)

## **2.21 PIPE WELDING**

All pipe welds shall be performed by certified welders employed by the pump station manufacturer. As part of the equipment submittal, the pump station manufacturer shall provide copies of the welding certificates of the employees who are to perform the pipe welds.

Shop welders shall be certified in accordance with ASME BPVC Section IX or AWS D1.1. Certification shall be done by an independent testing laboratory giving certification for the weld positions for which the tests were performed.

## **2.22 PIPE SURFACE PREPARATION**

All piping inside and outside surfaces shall be prepared by grit blasting, or other abrasive blasting, prior to any welds taking place to minimum SP-6 finish.

## **2.23 PIPE CUTTING**

Piping of 4" diameter and smaller may be cut by saw.

Piping of 6" diameter and larger shall be bevel cut, and Oxyfuel or Plasma-arc cutting techniques shall be used to assure and facilitate bevel pipe cuts.

## **2.24 SADDLE CUTS AND WELDS**

Saddle cuts in pipe made in preparation for a saddle weld of a pipe at an angle to a pipe shall be made with numerically controlled, plasma cutting machines. Similarly, saddle end cuts to pipes to make a saddle mating piece shall be done with the same numerically controlled plasma cutting equipment.

When the two saddle cut pieces are mated and welded with the MIG process, the internal finished weld shall be smooth and free of inclusions, crevices and other corrosion sites.

## **2.25 PIPE WELDING TECHNIQUES**

Pipe welds shall be performed by metal added, inert gas shielded arc welding (MIG) techniques wherein the weld heat settings, the wire feed speed and the traverse speed of the work below the welding are numerically set to assure proper weld fusion and penetration and repeatable welds.

In all cases, short circuit transfer, spray transfer or pulse-arc transfer modes of the gas metal arc welding process shall be used.

When utilizing the short circuit mode, shielding gas consisting of 50% carbon dioxide and 50% argon gas shall be used. When utilizing the spray or pulse-arc transfer modes, a shielding gas consisting of 5% carbon dioxide and 95% argon shall be used.

In all cases, welding wire with a minimum tensile strength of 70,000 psi shall be employed.

All flange welds and butt welds of equal size pipe shall be a single continuous nonstop weld around the complete circumference of the pipe. Whenever possible, vertical up weld passes will be applied to all pipe welds. No vertical down weld passes will be allowed.

Completed pipe welded assemblies shall create no internal obstruction, restriction or create any unintended sources of water deflection.

Piping of six (6) inch diameter and larger shall require a minimum of two (2) weld passes to complete each weld. The first pass, or root pass, shall be applied at the bottom of the bevel cut using the short circuit transfer welding mode, and the second pass, or cap pass, shall be applied over the root pass using the spray or pulse arc transfer welding modes to insure that at a minimum the total weld thickness shall be equal to thinnest of the two pieces being welded together.

The pipe shall be sand blasted, as specified elsewhere, before pipe weld and after pipe weld, before fusion bonded epoxy is applied.

## **2.26 WELD STANDOFFS**

No welding shall be performed on fusion bonded coated piping after the coating process has been performed.

Where any piping is to be welded after the application of fusion bonded epoxy coating to the inside of the pipe, at the point of the weld, a weld standoff must be welded to the pipe prior to the coating. The weld shall be made to the standoff and not onto the pipe.

## **2.27 TANK/WALL PENETRATION COATING PROTECTION SLEEVE**

Where a fusion bonded epoxy interior coated pipe passes through the steel tank shell or a steel wall section, prior to fusion bonded coating of that pipe, a pipe sleeve shall be welded over the pipe in the area where the pipe passes through the steel sheet.

The sleeve shall be one-half (1/2") inch thickness and fit closely over the transmission pipe. The sleeve shall be seal welded to the transmission pipe at each end with a full and continuous fillet weld.

Following the welding of the sleeve to the transmission piping, the sleeve welds and the sleeve shall be grit blasted to an SP-6 finish so the pipe is prepared for fusion bonded epoxy coating by the process specified elsewhere in these documents.

## **2.28 PIPE SUPPORTS**

Pipe supports by minimum sizing for:

- 8" and smaller piping shall be 2" x 3" x 3/16" wall rectangular tubing;
- 10" and larger piping shall be 3" x 4" x 1/4" wall rectangular tubing;
- 6" and larger piping shall be provided with "kick" bracing projecting fully from the underside of the pipe to the floor at an angle of no less than 15E from vertical out at a right angle to the run of the pipe being supported. These "kick" braces shall be in addition to the vertical pipe supports called out above.

Pipe supports are to be fully welded at both end points to the pipe and steel floor where required.

Where components are to be supported and may require disassembly at some time, the supports for these components shall be welded at the bottom and bolted at the top by use of a bolt yoke welded to the top of the support and bolted into the flange connection picking up at least three bolts.

## **2.29 FUSION BONDED EPOXY INTERNAL PIPE COATING**

The internal surfaces of piping to be fusion bonded coated shall be grit blasted to an SP-10 finish with the finish profile required by the coating material manufacturer.

The internal, wetted surfaces of the steel transmission piping shall have applied to it a Fusion Bonded Epoxy Coating on the interior pipe surface. The coating shall be applied and meet the testing requirements of Table 1 and Table 2 with the exception of Table 2 section

7 per AWWA C-213.

The powder coating product shall be National Sanitation Foundation (NSF) Standard 61 certified material.

Test	Requirement	Results
Specific Gravity	1.2 – 1.8	1.37 g/mL
Sieve Analysis	<2.0% on 100 mesh	0.14%
Gel time @ 400°F	7-150 seconds	25 seconds
Thickness	12-16 mils	12-16 mils
Impact	>100 in/lb	>100 in/lb
Appearance	Smooth & defect free	Smooth, defect free
Bendability	Pass 2.4 inch bend	Pass 1.8 inch bend
Shear Adhesion	>3000 PSI	5300 PSI
Penetration	<10%	8%
Abrasion Resistance	<0.300 grams loss	0.15 gram loss
Water Soak	1-3 Rating	1 Rating
Volume Resistivity	>1.1x10e15	2x10e15
Dielectric Strength	>1000 V/mil	1160 V/mil

The epoxy powder coating shall be IF1947T Red Epoxy Coating, latest revision from Valspar, Inc.

Prior to shipment of the station, the station manufacturer shall provide in writing to the ENGINEER certification that the fusion bonded epoxy coating has been applied to all internal surfaces of the steel piping using the proper method. Said certification shall show under the station manufacturer's letterhead:

- Date of application;
- Material manufacturer and product designation including a product data sheet for the coating;
- Applier of the fusion bonded coating, name, address and phone number;
- Notarized signature of an officer of the station manufacturing company stating the fusion bonded epoxy coating was applied to AWWA Standard C213-91 or the latest revision.

## **2.30 COATINGS**

### **2.30.1 CORROSION PROTECTION**

All interior and exterior surfaces of the exposed steel structure, transmission piping, and fittings shall be grit blasted equal to commercial blast cleaning (SSPC-SP6). Following fabrication, all exposed surfaces of the station, both interior and exterior, shall be coated according to the following requirements.

### **2.30.2 WELDMENT PRIME COATING**

All weldments will be pretreated by hand to provide additional corrosion protection using the same product as the base coat. Following the pretreatment full coating application shall take place.

### **2.30.3 BASE COATING**

The base coating shall take place immediately after surface preparation. The protective coating shall consist of a two-component, high solids, high build, fast drying epoxy system for protection and finishing of steel and having excellent corrosion resistant properties. The epoxy system shall be self-priming and require no intermediate coatings.

### **2.30.4 TOP COATING**

Following the base coating application, a full finish coating application shall take place. The protective coating shall consist of a two-component, high solids, high build, fast drying epoxy system for protection and finishing of steel and having excellent corrosion resistant properties. The epoxy system shall be self-priming and require no intermediate coatings. The base and finish coats shall provide a total dry mil thickness of 8.0 mils.

### **2.30.5 POST-ASSEMBLY COATING**

Following assembly and just prior to shipping, there shall take place a thorough cleaning of the floor of the station followed by a rolled on coating of the two part epoxy coating to cover over any scuffing or scaring that might have occurred during assembly.

### **2.31 SERVICE CONNECTIONS ON INTERNAL PIPING**

All plumbed devices within the station eventually requiring service, such as meters, control valves, pumps and like equipment, shall be easily removed from the piping by the presence of appropriately placed and sufficient quantity of adaptors and couplings as shown on the drawings; no less than the quantity of couplings and adaptors shown shall be allowed.

### **2.32 RESTRAINING POINTS**

The main inlet and outlet piping to the station shall each be provided with two (2) or four (4) restraining points as welded on "eyes" or similar device welded to the exterior piping as shown to facilitate the attachment of joint restraint tie rods or other device to be used in retarding any pipe movement at the connections.

### **2.33 COMPRESSION COUPLINGS**

The station piping shall include a variety of compression type, flexible coupling to prevent binding and facilitate removal of associated equipment. These couplings are to be where shown on the plans. In lieu of a compression coupling, a flanged coupling adapter (FCA) may be used.

Grooved fittings may not be used under any circumstance.

All compression couplings or flanged coupling adapters (FCA), and flexible connectors/expansion joints shall include a minimum of two (2) zinc coated steel threaded rods across the joint with appropriate bolted restraining points.

### **2.34 ELASTOMER PIPE CONNECTOR**

The inlet side of each booster pump shall include an elastomer connector to help isolate vibration and noise in the piping system. The elastomer connector shall be of single sphere design, constructed of neoprene and nylon with bias-ply tire reinforcing cord to provide a 225 psi working pressure rating to a minimum of 120 degrees F. The elastomer connector shall pass through the plate steel flanges designed to grip the connector so the connector seals without gaskets when the flange bolts are drawn up.

A control joint limiting pipe connector movement shall be supplied with each pipe connector.

### **2.35 LINE PRESSURE GAUGES**

Combination pressure gauges shall have a built-in pressure snubber and have 4-1/2" minimum diameter faces and turret style case, black fiberglass-reinforced thermoplastic with a clear acrylic window with Buna-N gasket. The movement shall be rotary; the bourdon tube shall be copper alloy C-type. The gauge shall have a 1/4" MNPT lower mount process connection and contain a 0.6 mm copper alloy restrictor. Combination pressure gauge range and scale graduations shall be in psi and feet of water as follows:

Gauge ranges shall be 0 - 200 PSI for each of the suction and discharge gauges for the pump station.

All gauges will be panel mounted off the pipeline and be connected to their respective sensing point. The gauge trim tubing shall be complete with both isolating and vent valves and the tubing shall be so arranged as to easily vent air and facilitate gauge removal. Gauges mounted directly to the pipeline or at the sensing point will not be accepted.

Gauge ranges, markings and gauge location shall be identified in the submittal documents.

### **2.36 STATIC AND SENSING LINES**

All gauge, switch and transmitter sensing lines shall be minimum 1/4" OD white polypropylene tubing run from the sensing point and a ball valve to the point of device mounting.

The pilot tubing shall be run in a workmanlike manner with elastomeric/stainless steel mounting straps to securely hold the tubing to be free of stress and vibration. The alignment and organization of the sensing lines shall be continuously rising.

### **2.37 SAMPLE TAP**

A single, right angle outlet, smooth nose, brass sample tap shall be affixed to the manual vent ball valve for the low suction lockout and suction pressure gauge assembly.

### **2.38 HOSE BIBB WITH VACUUM BREAKER**

There shall be provided a standard hose bibb with valve and vacuum breaker on the suction piping. The hose bibb connection shall be through a pressure regulator if the header pressure would exceed 60 psi.



### **2.39 BALL VALVES**

For piping of less than 3" size ball valves shall be used. The ball valves shall meet or exceed ASTM Spec B124 No. C37700. The ball valves will be 2-piece forged brass body, blow out proof stem, TFE seats, TFE packing with adjustable stem packing gland. The valves will be NPT threaded pattern complete with lever operators. Maximum working pressure shall be 600 psi.

### **2.40 BUTTERFLY VALVES**

Valve body shall be wafer style, for ANSI Class 125/150 flange bolting and have a metal reinforced, dovetail seat for drip-tight, bi-directional shutoff. The valve stem shall be one piece connected to the disk by stainless steel torque plugs with upper and lower RTFE inboard stem bearings and heavy duty upper stem bushing.

The valve body shall be cast iron with stainless steel disk and stem, EPDM seat, polyester upper stem bushing and NBR stem seal.

6" and smaller valves shall be equipped with a lever operator with 10 degree throttle stops. 8" and larger valves shall be equipped with a weatherproof, heavy duty handwheel gear operator.

Valve manufacturer:

- A. Keystone 221-786
- B. Nibco WC-1020-3

### **2.41 MANUAL VALVE ACTUATORS**

Manually operated butterfly valves size 6" and smaller shall be equipped with lever style operators capable of withstanding 450 ft. lbs. of input torque and mounted to the valve trunnion with 4 bolts.

Manually operated butterfly valves size 8" and larger shall be equipped with travelling nut style handwheel operators capable of withstanding 450 ft. lbs. of input torque and mounted to the valve trunnion with 4 bolts.

### **2.42 SWING CHECK VALVES – WAFER STYLE**

The check valve shall be a wafer style swing check design utilizing a 316SS torsional spring to assist in faster closure. The valve must be capable of gravity closure should the loss of spring tension occur and system back pressure is present. Valves with discs hinged in a line crossing

the projected part diameter or with center posts are unacceptable. The valve body shall be carbon steel one-piece construction with a field replaceable TFE seat. The seat shall provide positive shutoff at both low and high pressure. The valve shall utilize a one-piece disc/arm assembly of 316SS. The disc shall completely cover the seat when in the closed position. The valve shall be ANSI Class 300 rated with a maximum working pressure of 740 psi.

**THE SWING CHECK VALVE SHALL BE A KEYSTONE PRINCE FIGURE 809.**

#### **2.43 DOUBLE CHECK VALVE BACKFLOW PREVENTERS**

Double check valve backflow preventers shall be installed at referenced cross-connections to prevent the backflow of water. The cross-connections shall be determined by local inspection authority for use where a high hazard situation does not exist. Valve shall feature modular check assemblies with center stem guiding. Each check module shall have a captured spring and be accessible through a bolted cover plate. Seats shall be replaceable without special tools. It shall be a complete assembly including tight-closing resilient seated shutoff valves, test cocks, and a strainer is recommended.

**THE DOUBLE CHECK VALVE BACKFLOW PREVENTER SHALL BE WATTS MODEL 709 NRS.**

#### **2.44 WATER METER & STRAINER**

The booster pump station shall include a turbine type meter, sized as shown on the plans for this item. The turbine meter shall be flanged and shall conform to ANSI Class 125. The meter shall be provided with a bronze case and measuring chamber which shall include a polypropylene rotor with graphite radial bearings and a ceramic ring magnet embedded in the rear face of the rotor. The trim shall be stainless steel. A hermetically sealed direct reading register shall totalize in gallons with a 1,000 gallon sweep hand per revolution. The meter shall have a continuous flow range of 20 to 2000 gpm with a maximum intermittent flow of 2500 gpm. Maximum operating pressure shall not exceed 150 psi. The meter shall be capable of a 4-20 mA output signal. The turbine meter assembly shall be complete with a like size, plate type, top clean-out strainer upstream of the turbine meter as shown on the plans for this item.

**THE METER SHALL BE A BADGER RECORDALL TURBO II WITH A RFT RECORDALL FLOW TRANSMITTER AND A MODEL RSC-420 4-20 MA PULSE CONVERTER.**

#### **2.45 METER TEST PORT**

The meter installation shall be complete with a meter test port as shown on the plans for this item. The test port shall consist of a NPT coupling in the pipe downstream of the meter capable of accommodating a threaded by hose connection adapter. The connection shall be plugged.

#### **2.46 PRESSURE TESTING**

When the station plumbing is completed, the pressure piping within the station (including valves, pumps, control valves, and fittings) and connections, as make up the entire system, shall be hydrostatically tested at a pressure of 150 psi or a pressure equal to the lowest test pressure rating of the equipment within the tested system, whichever is lesser pressure. The test pressure shall be applied for a minimum of 20 minutes, during which time all joints, connections and seams shall be checked for leaking. Any deficiencies found shall be repaired and the system shall be retested.

The results of this testing shall be transmitted in writing to the ENGINEER prior to shipment of the station and shall note test pressure, time at full pressure and be signed by the Quality Control Manager or test technician.

#### **2.47 ELECTRICAL DESIGN, ASSEMBLY & TEST**

The electrical apparatus and control panel design, assembly, and installation, and the integration of component parts will be the responsibility of the manufacturer of record for this booster pumping equipment. That manufacturer shall maintain at his regular place of business a complete electrical design, assembly and test facility to assure continuity of electrical design with equipment application. Control panels designed, assembled or tested at other than the regular production facilities or by other than the regular production employees of the manufacturer of record for this booster pumping equipment will not be approved.

#### **2.48 CONFORMANCE TO BASIC ELECTRICAL STANDARDS**

The manufacturer of electrical control panels and their mounting and installation shall be done in strict accordance with the requirements of UL Standard 508A and the National Electrical Code (NEC), NFPA 70 latest revision so as to afford a measure of security as to the ability of the eventual OWNER to safely operate the equipment.

No exceptions to the requirements of these codes and standards will be allowed; failure to meet these requirements will be cause to remove the equipment and correct the violation.

**2.49 U.L. LISTING**

All service entrance, power distribution, control and starting equipment panels shall be constructed and installed in strict accordance with Underwriter's Laboratories (UL) Standard 508A "Industrial Control Equipment." The UL label shall also include an SE "Service Entrance" rating stating that the main distribution panel is suitable for use as service entrance equipment. The panels shall be shop inspected by UL, or constructed in a UL recognized facility. All panels shall bear a serialized UL label indicating acceptance under Standard 508A and under Enclosed Industrial Control Panel or Service Equipment Panel.

A photocopy of the UL labels for this specific project shall be transmitted to both the project ENGINEER and the CONTRACTOR for installation within their permanent project files, prior to shipment of the equipment covered under these specifications.

**2.50 E.T.L. LISTING**

All control panels shall be E.T.L. Listed by Interek Testing Services (ITS) under the Industrial Control Panel (ICP) Category. Each completed control panel shall bear an ETL listing label stating that the panel conforms to UL STD 508A and is certified to CAN/CSA STD C22.2 NO. 14. The listing label shall include the station manufacturer's name, address and telephone number. The station manufacturer shall have quarterly inspections performed by ETL at the manufacturer's facility to ensure that the products being listed comply with the report and procedural guide for that product.

**2.51 EQUIPMENT GROUNDING**

Each electrical equipment item in the station shall be properly grounded per Section 250 of the National Electrical Code. Items to be grounded include, but are not limited to, pump motor frames, control panel, transformer, convenience receptacles, dedicated receptacle for heater, air conditioner, dehumidifier, lights, light switch, exhaust fans and pressure switches.

All ground wires from installed equipment shall be in conduit and shall lead back to the control panel to a copper ground buss specific for grounding purposes and so labeled. The ground buss shall be complete with a lug large enough to accept the installing electrician's bare copper earth ground wire. The bus shall serve as a bond between the earth ground and the equipment ground wires.

## 2.52 PANEL MOUNTING HARDWARE

Metal framing channel and hangers shall be used exclusively for mounting of electrical panels and electrical components except for those specifically designated otherwise.

## 2.53 ELECTRICAL SERVICE

The electrical service provided for this station will be 480 volt, 3 phase, 60 Hertz, 4 wire.

## 2.54 CONTROL PANEL

All circuit breakers, electromechanical contactor motor starters, time delay relays and control relays shall be incorporated into one (1) NEMA 1 control panel.

The main circuit breaker shall be rated for 200 amp service.

The panel shall be complete with the following branch circuit breakers:

- One (1) 3-pole, 200 amp main breaker;
- Two (2) 3-pole, 90 amp pump motor breakers;
- One (1) 3-pole, 15 amp phase monitor breaker;
- One (1) 3-pole, 30 amp surge protection breaker;
- One (1) 2-pole, 30 amp primary transformer breaker;

There shall be provided thermal-magnetic trip circuit breakers as follows:

One (1) Transformer Breaker, Secondary Side, 60 amps;  
Eight (8) Auxiliary Circuit Breakers, as follows:

1. 1p,6amp Controls
2. 1p,15amp Telemetry
3. 1p,15amp Lights
4. 1p,15amp Convenience Outlets
5. 1p,20amp Dehumidifier/Sump Pump
6. 2p,20amp Heater
7. 1p,15amp Ventilation Fan
8. Spare

## **2.55 ELECTROMECHANICAL CONTACTOR MOTOR STARTERS**

Where designated, those motors shall be controlled by using combination electromechanical contactor motor starters. The motor starters devices shall be combination motor starters and overload protection devices as full voltage, non-reversing designated for AC motor starting being rated for continuous duty.

The operational voltage shall be 480 volts, three phase.

The electromechanical combination motor starters shall be IEC type.

Control voltage shall be 120 VAC.

## **2.56 ELECTRICAL POWER TRANSFORMER**

Balanced 115/230 single phase power for the auxiliary circuits within the scope of each booster station shall be obtained by use of a 10 KVA dry, step down transformer. The transformer shall be wall mounting type, in a NEMA 3R non-ventilated weatherproof enclosure. Transformer shall operate with noise levels equal to or less than ANSI and NEMA standards. Transformer insulation shall be Class 180c.

The transformer shall meet the most recent standards for efficiency.

The unit shall be "UL" approved for indoor/outdoor application.

## **2.57 TELEMETRY CONTROL INTERFACE PANEL**

It will be the responsibility of the station manufacturer to provide the following as an adjunct to the supplied telemetry equipment.

1. 1" telemetry entrance conduit complete to telemetry panel.
2. Size 12" x 12" NEMA 1 telemetry interface panel.
3. Separate 120 volt single phase power circuit in conduit to the telemetry interface panel.
4. Telemetry control circuits made up and in conduit from main control panel to telemetry interface panel terminal strip.
5. Metal framing channel to mount telemetry equipment.

In addition to the telemetry control interface panel, the station shell shall contain a threaded coupling bulkhead penetration through the wall for routing of radio coax cabling to the external antenna.

## **2.58 ALARMS CONDITION AND INPUTS/OUTPUTS**

The following alarms/status points shall be included within the booster pump station and wired back to the interface panel:

1. Provide indication as to the positions of the HAND-OFF-AUTOMATIC selector switches on the pumps.
2. Water Within Station - The water alarm shall be a 120 volt AC circuit driven by a float switch wall-mounted within the equipment capsule. The float switch shall be of the magnetic float type with the float moving up and down a guide tube. One half (1/2) inch of float movement shall actuate the SPST reed type switch inside the guide tube. The switch shall be so mounted that when water reaches a point one (1) inch above the sump the float switch will activate the alarm. The alarm will be sealed in through an auxiliary relay and will be manually reset via a push button station.
3. Unauthorized entry alarms on hatches and doors - The unauthorized entry alarm shall be a 120 volt AC circuit driven by a hatch-mounted limit switch. The limit switch shall be the adjustable arm, roller contactor type which makes an internal SPST micro switch. The switch will be so mounted as to active anytime the entrance man way hatch is opened.
4. Low Suction Pressure alarm – The low suction pressure alarm shall be provided by the low suction lockout pressure switch as described elsewhere.
5. Pump #1 – Pump run signal
6. Pump #1 – Pump stop signal
7. Pump #2 – Pump run signal
8. Pump #2 – Pump stop signal

## **2.59 PUMP MOTOR RUN TIME METER**

The control panel shall contain one running time meter supplied for each pump to show the cumulative number of hours of operation.

The meter shall be enclosed in a dust and moisture proof molded plastic case, suitable for flush mounting on the main control panel.

The meter dial shall register in hours and tenths of hours up to 99999.9 hours before repeating.

The meter shall be suitable for operation from a 115 volt, 60 cycle supply.

## **2.60 ELECTRICAL PHASE MONITOR**

**A phase monitor** shall be supplied to protect three-phase equipment against phase loss, undervoltage and phase reversal conditions.

When a fault is sensed, the monitor output relay opens within two seconds or less to turn the equipment off and/or cause an audio or visual alarm. Both Delta and Wye systems may be monitored. The monitor shall have an automatic reset and shall also include an adjustable voltage delay.

The monitor shall have an indicator LED (glows when all conditions are normal and shall monitor phase sequence: ABC operate (will not operate CBA). The phase monitor shall be UL approved and CSA certified.

## **2.61 SURGE PROTECTION DEVICE**

A secondary surge arrester shall be provided. Housing shall be Noryl and be ultrasonically sealed. Valve blocks shall be metal oxide with an insulating ceramic collar. Gap design shall be annular. The lead wire shall be permanently crimped to the upper electrode forming part of the gap structure.

Arresters shall be UL and CSA listed Lightning Protective Devices.



## 2.62 ELECTRICAL CONDUIT AND WIRING

All service entrance conduits power and signal, shall be rigid steel conduit, individually sized to accept the inbound service conductors and telemetry/telephone/radio cables.

These service entrance conduits shall be installed from the main power or control panel through the capsule steel sidewall or the building floor and terminate exterior to the equipment enclosure as a thread hub. The service entrance exterior conduit connection points shall be capped or plugged for shipment.

All wiring within the equipment enclosure and outside of the panel enclosures shall be run in conduit except where watertight flexible conduit is properly used to connect pump drivers, fan motors, solenoid valves, limit switches, etc., where flexible connections are best utilized.

Devices and appliances where furnished by the original manufacturer and being equipped with a UL approved rubber cord and plug, may be plugged into a receptacle.

Equipment enclosure conduits shall be rigid, heavy wall, Schedule 40 PVC with solvent weld moisture-proof connections, in minimum size 3/4" or larger, sized to handle the type, number and size of equipment conductors to be carried.

The conduiting shall be in compliance with Article 347 of the National Electrical Code and NEMA TC-2, Federal WC-1094A and UL-651 Underwriters Laboratory Specifications.

Where flexible conduit connections are necessary, the conduit used shall be Liquid-tight, flexible, totally nonmetallic, corrosion resistant, nonconductive, U.L. listed conduit sized to handle the type, number and size of equipment conductors to be carried - in compliance with Article 351 of the National Electrical Code.

Motor circuit conductors shall be sized for load. All branch circuit conductors supplying a single motor of one (1) horsepower or more shall have an ampacity of not less than 125 percent of the motor full load current rating, dual rated type THHN/THWN, as set forth in Article 310 and 430-B of the National Electrical Code, Schedule 310-13 for flame retardant, heat resistant thermoplastic, copper conductors in a nylon or equivalent outer covering.

Control and accessory wiring shall be sized for load, type MTW/AWM (Machine tool wire/appliance wiring material) as set forth in Article 310 and 670 of the National Electrical Code, Schedule 310-13 and NFPA Standard 79 for flame retardant, moisture, heat and oil resistant thermoplastic, copper conductors in compliance with NTMA and as listed by

Underwriters Laboratories (AWM), except where accessories are furnished with a manufacturer supplied UL approved rubber cord and plug.

### **PART 3 CONTROL SUBROUTINES AND DEVICES**

#### **3.1 DISCRETE SUCTION PRESSURE CONTROL**

Separate from the control logic suction control of the pumping operation shall be provided by a bellows type, adjustable differential pressure switch. The switch shall be complete with a single pole, double throw contact block with 5 amp non-inductive rated contacts at 230 volts AC. The set points of the on/off cycle shall be independently adjustable through the full range of the switch rating.

1. Low Suction Cut-out, 4-150 psi.
- 1A. Adjustable Differential, 2-25 psi.

A pressure gauge shall be sub-panel mounted adjacent to the low suction pressure switch. The gauge and switch shall be so plumbed with the suction header sensing line that a common blow off valve can relieve pressure in both simultaneously for purposes of checking and calibrating the low suction lock-out.

#### **3.2 ELECTRICAL DEVICES**

Multi-position switches including Hand-Off-Automatic switches shall be oil tight, 3-position maintained and be located on the main control panel door. Each pump HOA switch shall contain an extra contact block to provide a "Pump in Auto" dry contact, wired to terminals, for the telemetry remote transceiver unit (RTU).

Indicating lights shall be oil tight, with a full voltage pilot light.

Nameplates shall be furnished on all panel front mounted switches and lights.

Switches, lights and pushbuttons shall be Schneider Electric, Series XB, 22 mm, Die Cast Chrome plated devices. Pilot lights shall be with protected LED's for 120 Vac operation as XB4BVG, pushbuttons shall be non-illuminated, momentary contact, extended lens as ZB4BL and the switches shall be 2 position maintained, 2 position right-to-left, 3 position maintained, 3 position momentary-to-center, 3 position momentary from left to center, and 3 position momentary from right to center with standard black lever as ZB4BD.

#### Switches

1. Pump #1, 3-position with extra "In Auto" contact block
2. Pump #2, 3-position with extra "In Auto" contact block;
3. Exhaust Fan, 2-position;
4. Telemetry-Off-Test, 3-position.

#### Lights

1. Red – Low Suction Pressure;
2. Green – Pump #1 in Operation;
3. Green – Pump #2 in Operation;

The solid state time delay relay shall have an adjustable time range of 10 seconds to 10 minutes. The relays shall be constructed to use a DIN rail mount socket so that the relays can be replaced without disturbing the wiring. The relay shall be complete with LED indicators for output and power.

#### Time Delay Relays

1. Low Suction Timer
2. Start Control Timer Pump #1
3. Stop Control Timer Pump #1
4. Start Control Timer Pump #2
5. Stop Control Timer Pump #2
6. Parallel Start Pump #1
7. Parallel Start Pump #2

The control panel door shall be complete on the interior with a stick-on transparency containing an "as-built" reproduction of the electrical control panel schematic. The wiring diagram shall be a corrected "as-built" copy & contain individual wire numbers, circuit breaker numbers, switch designation & control function explanations.

The following dry contact closures, wired to terminals, shall be provided for the telemetry RTU panel, wired to the telemetry interface panel:

1. Pump No. 1 Running
2. Pump No. 2 Running
3. Pump No. 1 in Auto
4. Pump No. 2 in Auto
5. Intrusion Door Switch
6. Low Suction Alarm
7. Station Flood (switch provided by telemetry manufacturer)

8. Phase Fail

The following dry contact closures will be provided by the telemetry RTU panel for starting – stopping the booster pumps in the “telemetry” mode, with cycle alternation provided by the telemetry RTU:

1. Pump No. 1 Required
2. Pump No. 2 Required

The following analog output (4-20 ma) shall be provided by the booster station manufacturer and wired to terminals and to the telemetry interface panel:

1. Station Flow (gpm)

**PART 4 FACILITIES EQUIPMENT**

**4.1 STATION INTERIOR LIGHTING**

There shall be one or more two-tube, 32 watt per tube, electronic start, enclosed and gasketed, forty-eight (48) inch minimum length fluorescent light fixtures installed within the equipment enclosure, as shown on the plan for this item. The light switch shall be of the night glow type and be located conveniently adjacent to the door.

Open fluorescent or incandescent fixtures **will not** be accepted.

**4.2 DEHUMIDIFIERS**

1. One (1) each, installed as shown.
2. Capacity 30 pints per 24 hours.
3. Compressor rated 115 volts, 60 Hz, 4.3 operating amps.
4. 106 CFM fan, 2 fan speed.
5. Humidity range 35 to 80% RH, ambient temperature range of 41 to 95 F, Type R410A refrigerant.
6. Washable filter.
7. Condensate piped direct to drain.
8. UL listed rubber cord.

### 4.3 HEATERS

1. One (1) each, wall mounted as shown.
2. Rating - 10,239 BTU/HR - 3000 watts, 240 volt.
3. Enclosed resistance wire within steel finned element.
4. Control - thermostat.
5. UL listed.
6. Fan forced.
7. Hard wired in conduit per UL 400-1.

### 4.4 EXHAUST FAN

1. One (1) each, installed as shown.
2. Capacity each 230 cfm at .2 inch static pressure.
3. Shaded pole motor - squirrel cage blower.
4. Hard wired in conduit to conduit box on motor per UL 400-1.
5. 120 volt A.C. operation from wall mount thermostat and HAND/AUTO switch on main control panel.
6. Hatch installed limit switch to activate exhaust fan whenever the entrance hatch is open.
7. Exhaust air piping - 4 inch minimum.
8. Air return piping - 4 inch minimum.
9. Exhaust and return piping protected by 180° PVC return bend with removable insect screen.

### 4.5 SUMP PUMP

1. One (1) each, installed as shown.
2. Capacity 19 gpm at 15 feet TDH.
3. Vortex type Impeller - plastic, glass filled with metal insert.
4. Cast iron motor shell, switch case and pump housing.
5. UL listed submersible oil filled motor - UL listed rubber power cord - 120 volt AC operation.
6. Float operated, submersible (NEMA 6) mechanical switch.
7. Completely submersible, hermetically sealed.
8. Auto reset thermal overload protection.
9. PVC pump discharge piping 1 1/2" x 1 1/4" with single check valve - union both sides.
10. Provision for dewatering drain system for freeze protection.

#### **4.6 MANUAL TRANSFER SWITCH**

A double throw switch shall be furnished to transfer the electrical load from one supply to another. Terminals shall be suitable for 60 degrees or 75 degrees Celsius, Al or Cu wire on 30-100 amperes; 75 degrees Celsius for above 100 amperes.

The manual transfer switch shall have a lockable door hasp along with a lockable handle. The manual transfer switch interlocking mechanism shall be integrated with the access door. The mechanism shall prevent connections from being energized unless the access door is closed.

The transfer switch shall be non-fusible, 3 pole, 600 VAC, 200 amp. The manual transfer switch shall be in a NEMA 1 enclosure.

Transfer switch shall be suitable for service entrance use with neutral or ground lug kit installed.

The manual transfer switch shall be a model DT364UGK as manufactured by Cutler Hammer.

#### **4.7 GENERATOR RECEPTACLE ASSEMBLY**

A generator receptacle shall be furnished to supply power to the station during outages. The generator receptacle shall be rated as 4-wire, 4-pole, 600 VAC, 200 amp, 50-400 hertz. The generator receptacle shall have a NEMA 4 rating. Generator Receptacle shall be dirt tight, dust tight, moisture resistant and be weather proof housing. Receptacle shall include weather proof self closing spring door. Receptacle shall be electro galvanized aluminum acrylic painted ferrous iron alloy.

Receptacle assembly shall consist of a back box with angle adapter along with receptacle with reverse service connector.

The manual transfer switch shall include a receptacle assembly, Model AREA204126-S22 as manufactured by Crouse Hinds.

END OF SECTION

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**SECTION 11248**

**Supervisory Control and Data Acquisition (SCADA) Equipment and Instrumentation**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

**1.2 SUMMARY:**

- A. Extent of instrumentation and control equipment work is indicated by drawings and schematics, and is hereby defined to include, but not by way of limitation, control panels, flow measurement, recorders, transmitters, hardware and software, etc.
- B. Types of instrumentation and control equipment specified in this section include the following:
  - 1. JCWD1 Office Master Terminal Unit (MTU)
  - 2. Lowry Booster Pump Station (BPS) Remote Transceiver Unit (RTU) RTU-1
  - 3. Groggins Ferry Tank RTU-2
  - 4. Industrial Park Control Valve Station RTU-3
  - 5. Eisenhower Tank RTU-4
  - 6. Brannon BPS / Ash Tree Master Meter RTU-5
  - 7. Brannon Tank RTU-6
  - 8. Brannon Crossing Master Meter RTU-7
  - 9. Flow Meters Retrofit Parts and Accessories
  - 10. Tank Level / Pressure Transmitters
  - 11. Desktop Computer, HMI Software and PC Accessories
  - 12. Spare Parts
- C. The CONTRACTOR shall have the responsibility for the installation of instrumentation and control wiring conduits and cables. Such electrical work must be installed in accordance with the requirements of the Instrumentation and Controls System supplier and in accordance with applicable Local/State/Federal Codes and Regulations.
- D. Refer to other sections for concrete bases for the plant metering equipment, install anchor bolts and other items to be embedded in concrete according to manufacturer's instructions and recommendations and as specified elsewhere.

**1.3 SUBMITTALS:**

- A. Product Data: Submit manufacturer's data on instrumentation and control equipment and components.
- B. Shop Drawings: Submittals shall be bound in 8-1/2" x 11" booklet with fold-out 11" x 17" wiring schematics. The booklet shall contain a list of all components proposed in the control system and contain manufacturer's specifications and information on each item.
- C. Wiring Diagrams: Submit wiring diagrams for instrumentation and control equipment and components showing control and interconnection wiring, including connections to equipment components and electrical power feeders. Diagrams shall be drawn from the latest version of AUTOCAD. A disk containing these drawings shall be furnished to the ENGINEER for submittal review and record drawings. Differentiate between portions of wiring that are manufacturer-installed and portions that are field-installed. These drawings shall be coordinated with other specialty panels, motor control centers, and subsystems not included in this section but interconnected to form a finished operational system. When the job is completed, a fully documented record of this interconnected system shall be furnished to the OWNER and ENGINEER and shall be labeled as "Record Drawings".
- D. Agreement to Maintain: Prior to expiration of warranty period, the Installer shall submit 6 copies of an agreement for continued service and maintenance of instrumentation and controls equipment, for OWNER's possible acceptance. Offer terms and conditions for furnishing parts and providing continued testing and servicing, including replacement of materials and equipment, for one year period with option for renewal of Agreement by OWNER.
- E. Maintenance Manuals: CONTRACTOR shall furnish six (6) sets of installation, operations and maintenance manuals which contain equipment cuts, operating instructions, troubleshooting procedures, as-built wiring schematics and spare parts list for equipment. Ensure manuals include operating instructions.
- F. Bill of Materials: CONTRACTOR shall submit a complete "Bill of Materials" to provide adequate information by manufacturer and specifications to permit an exact duplicate maintenance replacement item to be obtained without additional data.
- G. All the above shall also be submitted to the ENGINEER in electronic format (PDF).



## 1.4 QUALITY ASSURANCE

- A. The system specified shall be supplied by a systems integrator specializing in water and wastewater control systems. The systems integrator shall have a minimum of twenty years documented experience operating as the same entity. The system integrator shall supply the complete system and shall have undivided system responsibility for the proper operation and warranty of the equipment furnished and specified herein.
- B. The systems integrator shall directly employ all start up technicians utilized for this project. All service technicians utilized shall have obtained certification by the National Institute for Certification in Engineering Technologies (NICET) through written examination to level II. A lead technician, certified to level IV, shall directly supervise all service technicians. Subletting of system start up to third party providers is specifically prohibited. The systems integrator shall maintain a service facility within 100 miles of the project site.
- C. All control panels shall be listed by Underwriters Laboratories, Inc. Standards for industrial control panels and shall bear a serialized U. L. 508 listing mark. All Panels shall be integrated by a UL 508 listed integration facility.
- D. The C. I. Thornburg Co., Inc. of Lexington, KY and Huntington, WV, representing Siemens Industries, has submitted information as to the requirements outlined herein and has been determined to meet the intent of these specifications. Other systems integrator's desiring consideration as an alternate to the base bid shall provide complete details as to the equipment proposed, compliance with insurance requirements, NICET certification of service technicians, references to similar installations with names and telephone numbers, a statement of compliance with the specifications including a paragraph by paragraph review describing any and all exceptions to the specifications, and any equipment substitutions. Alternate submittal packages shall be submitted to the ENGINEER by the bidding CONTRACTOR on his letterhead with his bid. Submittal packages will not be accepted directly from manufacturers or suppliers. Note that the contract will be awarded on the base bid items without consideration of alternates. The OWNER reserves the right to accept alternates after award.

## 1.5 WIRING REQUIREMENTS

- A. The equipment shall be constructed in compliance with Underwriter's Laboratories (UL) Industrial Control Panels listing and following-up service, utilizing UL listed and recognized components where applicable. The new control panels shall be built in a Underwriter's Laboratory listed manufacturing facility and labeled to that effect.

- B. All wiring shall be minimum 600 volt UL type MTW or AWM and have a current-carrying capacity of not less than 125% of the full load current. The conductors shall be in complete conformity with the national electric codes, state, local and NEMA electrical standards. For ease of servicing and maintenance, all wiring shall be color coded. The wire color code shall be clearly shown on the drawings, with each wire's color indicated.
- C. All control wiring shall be contained within plastic/PVC wiring duct with covers. Where dimensional constraints prevent the use of wiring duct, wires shall be trained to panel components in groupings. The wire groupings shall be bundled and tied not less than every 3 inches with nylon self-locking cable ties as manufactured by Panduit or equal.
- D. Every other cable tie shall be fastened to the enclosure door or inner device panel with a cable tie mounting plate with pressure tape. Where wiring crosses hinged areas such as when trained from the inner device panel to the enclosure door, spiral wrap shall be used.

## **1.6 INCOMING SERVICE AND LIGHTNING ARRESTOR**

- A. The incoming service for each telemetry panel shall be 120 volt, 1 phase, 2 wire, 60 Hertz unless otherwise noted on the plans or herein. A single phase lightning arrestor shall be supplied in the control system and connected to each line of the incoming side of the power input terminals. The arrestor shall protect the control system against damage as the result of transient voltage surges caused by lightning interference, switching loads and power line interferences. It shall begin shunting to ground at 600 volts maximum.
- B. All metering shall be done ahead of the main disconnect and control panel. The meter shall be existing or installed by the Contractor in accordance with company requirements. A new power drop will be required at the Dale Master Meter location. Power requirements for the Brannon Booster/Limestone Meter RTU panel will be distributed from the new booster station panel.
- C. Each panel shall be supplied with a properly sized control power circuit breaker. The breaker shall supply power to all control wiring within the enclosure.

## **1.7 CONDENSATION PROTECTION**

- A. A 120VAC condensation-protective heater and high temperature cutout thermostwitch shall be provided in each tank remote telemetry/control panel (RTU's).

## 1.8 SIGNAL ISOLATION PROTECTION

- A. Transient protection or isolation shall be integrally provided with all equipment to protect all instrumentation and telemetry devices either receiving or sending signals. An isolator shall be furnished in all RTU's panel when analog input or output wiring is required per the Input/Output (I/O) tables.

## 1.9 OPEN COMMUNICATIONS STANDARDS/PROTOCOL

- A. The proposed telemetry system must employ a high level, efficient and secure communications protocol for communications between Master Telemetry Unit (MTU), and Remote Telemetry Units (RTUs). As a minimum the telemetry system shall utilize CRC16 or other high level error detection/rejection protocols to ensure true transmission/reception of data. Systems utilizing communications protocols with less capable error detection/rejection capabilities shall not be suitable for this application and will be rejected.
- B. The proposed telemetry system shall utilize a protocol that will permit interface with other equipment that may not be supplied by the same manufacturer. *Protocols that are close-ended are not acceptable.* The system supplier shall provide to the OWNER documentation describing the supplied communications protocol in sufficient detail so that it may be used in future telemetry additions to insure the ability of other third party RTUs and/or PLCs to interface with the system.
- C. The proposed telemetry system must also be able to support communications protocols other than its own native protocol. The system supplied, as a minimum shall be able to output data via RS-232 serial communications in simple ASCII format thus insuring a primary means of interfacing with non-related equipment.
- D. The proposed telemetry supplier must have required personnel on staff that possess the ability to modify the telemetry system's native communications protocol to provide possible interface with equipment that is existing or cannot be modified. OWNER will be responsible for supplying all required communications protocol information necessary to permit development of communications protocol emulation where required.

## 1.10 SYSTEM RESPONSIBILITY

- A. Basis of Design: The drawings and specifications have been developed based on a Controls and Instrumentations System supplied by The C.I. Thornburg, Inc., Huntington, West Virginia and manufactured by Siemens Industries of Vadnais Heights, MN. Any costs resulting from changes made necessary by the approval of other systems shall be borne by the CONTRACTOR. This shall include all design

work and drawing and specification revisions by the ENGINEER. Also, the CONTRACTOR shall submit drawings to the ENGINEER for approval showing all changes made necessary by the other equipment.

- B. Responsibility: To ensure that all equipment required for the installation of the Controls and Instrumentation System is properly coordinated and will function as a unit in accordance with the intent of these specifications, the CONTRACTOR shall obtain all the equipment specified under this Section from a single supplier in whom the responsibility for the proper function of all the equipment, regardless of manufacturer, as an integrated and coordinated system shall be vested. The intent of this paragraph is to establish unit responsibility for all equipment with the Controls and Instrumentation System supplier. The use of the word "responsibility" relating to the equipment supplier is in no way intended to relieve the CONTRACTOR's ultimate responsibility for equipment coordination, installation, operation, and guarantee.

### **1.11 DELIVERY, STORAGE AND HANDLING:**

- A. Deliver instrumentation and controls equipment and components in factory-fabricated type containers or wrappings, which properly protect equipment from damage during transit, storage, and installation.
- B. Store instrumentation and controls equipment in original packaging and protect from weather and construction traffic. Store indoors and in accordance with manufacturer's recommendations.
- C. Handle instrumentation and controls equipment carefully to prevent physical damage to equipment and components. Do not install damaged equipment; remove from site and replace damaged equipment with new.

## **PART 2 - PRODUCTS**

### **2.1 SUPPLIERS:**

- A. Available Suppliers: Subject to compliance with requirements, suppliers offering products which may be incorporated in the work include, but are not limited to the following:
  - 1. The C. I. Thornburg Co., Inc., Huntington, West Virginia representing Siemens Industries of Vadnais Heights, MN
  - 2. Another manufacturer who can supply Instrumentation and Controls System that has equivalent qualities complying to specifications. The ENGINEER shall evaluate this product to determine compliance to specifications.

## 2.2 PROJECT SCOPE

- A. The control and monitoring system of the Distribution System water storage tanks and water booster stations/control valves shall be accomplished with a Supervisory Control and Data Acquisition system (SCADA) consisting of one centralized main control panel located at the Jessamine Co. Water District No. 1 office communicating with the booster station, control valve and storage tank RTU's via radio communication, and connected locally to a desk-top computer with Human Machine Interface (HMI) software. The central control panel shall monitor all system information, monitoring of alarms, equipment status and process variables, in addition to providing remote control and manual override of all remote and local pumps and valves. The water office site shall consist of a Microprocessor-based Master Transceiver Unit (MTU) as described elsewhere in these specifications. The MTU shall provide communications with the remote sites, local I/O capability, remote booster station and valve operation and status indication, tank level control and alarm annunciation. Systems that require the desktop computer to provide control and monitoring of the system shall not be acceptable.
- B. The SCADA system shall consist of the following:

### ***Unit A – Jessamine Co. Water Office MTU***

(1) Microcomputer-based Control/Monitoring unit with operator interface as described within a wall mounted NEMA 1 gasketed enclosure, with communication to the Distribution System RTU's via VHF licensed radio communication, and locally connected to a desk top computer running HMI software. The panel shall be powered by local 120 vac incoming service w/ battery backup.

### ***Unit B - Water Storage Tank Level Transceiver Panel RTU's***

(Groggins Ferry Tank RTU-2, Eisenhower Tank RTU-4, and Brannon Tank RTU-6)

(3) Water Storage Tank remote transceiver units to transmit tank level to the MTU via radio communication, mounted within a NEMA 4X fiberglass enclosure. The RTU's shall be mounted on a new treated lumber backboard assembly or existing structure as shown on the drawings. The tank RTU's will be powered by new 120 VAC incoming power service with battery backup.

### ***Unit C – Lowry Water Booster Station Transceiver Panel RTU-1***

(1) Water Booster Station remote transceiver unit to transmit pump status and receive pump on-off commands to and from the MTU via radio communication, mounted within a NEMA 1 gasketed wall mount enclosure and powered by 120 VAC incoming power service with battery backup. Input/output shall be connected to the existing or new pump motor

control panels. Refer to the I/O tables for details.

***Unit D – Industrial Park Control Valve Station Transceiver Panel RTU-3***

(1) Control Valve Station remote transceiver unit to transmit valve status and flow, and receive valve open-close commands to and from the MTU via radio communication, mounted within a NEMA 1 gasketed wall mount enclosure and powered by 120 VAC incoming power service with battery backup.

***Unit E – Brannon Water Booster/ Ash Tree Meter Station Transceiver Panel RTU-5***

(1) Water Booster Station and Master Meter remote transceiver unit to transmit flow and pump status and receive pump on-off commands to and from the MTU via radio communication, mounted within a NEMA 1 gasketed wall mount enclosure and powered by 120 VAC incoming power service with battery backup. Input/output shall be connected to the existing or new pump motor control panels. Refer to the I/O tables for details.

***Unit F – Brannon Crossing Meter Station Transceiver Panel RTU-7***

(1) Master Meter remote transceiver unit to transmit flow status to and from the MTU via radio communication, mounted within a NEMA 4X fiberglass gasketed wall mount enclosure and powered by 120 VAC incoming power service with battery backup. A new power service drop will be required for this location. Refer to the I/O tables for details.

***Unit G – Tank Level Pressure Transducers***

(9) Pressure transmitters shall be furnished and installed for monitoring tank level, booster and valve station suction and discharge pressure. Each transducer shall be powered from the corresponding tank RTU with 12 volt dc input, and transmit a 4 to 20 mA output level signal to the RTU. The transmitters at all locations shall be mounted within a NEMA 4X fiberglass enclosure along with a pressure gauge, shut off and bleed valves.

***Unit G – District Office Personal Computer, Software, and Accessories***

(1) Personal Computer, HMI software and accessories for installation at the Water District Office and connected to the Unit A MTU panel for transmitting and receiving data from the RTU's, trending tank levels, archiving alarms and equipment run times, and printing reports and trends. The PC shall be furnished with an ink jet printer for trends and reports, along with a UPS. The HMI PC shall also be integrated with remote alarm notification software for telephone notification of operators on selected alarms.

**Unit H – Flow Meter Accessories**

Flow meter electronic register components shall be furnished and installed in the existing register stack on the 6" and 2" Neptune master meters in the Brannon BPS/Limestone and Dale Master Meter locations. The registers shall be powered by the RTU panel and transmit both a 4-20 ma and totalization pulse to the RTU panel for the transmission of flow rate and total.

**Control Requirements**

The MTU microprocessor-based controller shall provide level control for the following:

- 1) Groggins Ferry Tank from Lowry Booster Pump Station
- 2) Eisenhower Tank from the Industrial Park Valve Station
- 3) Brannon Tank from the Brannon Booster/Limestone Master Meter Station

Additional control requirements include:

- 1) Booster pump cycle alternation with override selection from HMI / MTU
- 2) Low suction pressure cut-out alarm / restore at booster stations
- 3) High discharge pressure cut-out alarm / restore at booster stations
- 4) "Pump Fail to Start" alarms will be generated in software when after an adjustable time period following a "Pump Start Command" has expired before a "Pump Run" status input is received at the local RTU PLC.

Costs for additional equipment such as repeater units that are not specified shall be the responsibility of the CONTRACTOR and be reflected in the bid price total. The OWNER shall not be responsible for additional equipment that is required to adequately transmit data back to the Water Office master unit. The OWNER will be responsible for acquisition of property and easements where repeater units are required, and power drops/service.

**2.3 SYSTEM REQUIREMENTS****A. WATER OFFICE MASTER CONTROLLER/TRANSCEIVER TELEMETRY UNIT**

1. The central control panel MTU shall be supplied as a complete package including all hardware and software necessary to provide a completely functional system. The system shall be factory tested, debugged and ready for installation.
2. The MTU shall be furnished in a NEMA 1 enclosure suitable for floor or wall mounting and shall include a circuit breaker, electrical surge protection and power supplies. The MTU shall be front panel mounted to permit operator access for viewing system status and alarm acknowledgment functions. The

MTU will continue to communicate with the RTUs and display system status/alarm information including alarm horn and silence capability in the event of incoming alarms. The MTU's display shall be capable of showing all discrete and analog points in their proper state and engineering units, and contain booster pump hand-off-auto switches in the Operator Interface panel for remote operation. The MTU shall be battery backed (via UPS) to maintain telemetry functions, process status and alarm display as necessary during power outages.

3. The MTU shall be capable of utilizing FM VHF/UHF radio communication to communicate with the various water distribution system RTU's. The MTU shall have local I/O capabilities for any locally monitored equipment and processes. The MTU shall allow on-line user configuration of alarms and event information and permit logical grouping of alarms. The MTU as a minimum shall perform the above functions and as described elsewhere in these specifications.

#### B. STORAGE TANK / BOOSTER AND VALVE STATION RTUs

1. The Storage Tank RTU's shall be furnished in a 4X fiberglass enclosure as herein described suitable for wall mounting and shall include a remote tank level/ pressure transducers, circuit breaker, electrical surge protection, battery backed power supplies, thermostatically controlled condensation protection and all other features as described herein and elsewhere in these specifications. The RTUs shall utilize data radios to communicate to and from the MTU.
2. The Booster or Valve Station RTU shall be furnished in a NEMA 1 gasketed enclosure as herein described suitable for wall mounting and shall include I/O connection to the booster motor control panel, circuit breaker, electrical surge protection, battery backed power supplies, thermostatically controlled condensation protection and all other features as described herein and elsewhere in these specifications. The RTUs shall utilize data radios to communicate to and from the MTU.
3. The Microprocessor-based controllers described elsewhere in these specifications shall be mounted within the enclosure inner door (tanks) or outer door (booster stations) with all required input/output capability to meet the job requirements with not less than 10% spare capacity for future expansion. The controllers shall be battery backed to maintain telemetry functions during power outages.



4. Each RTU shall be provided with the designated NEMA type enclosure and input/output (I/O) configuration as shown in the tables at the end of this specification section. Note that the table lists current configuration of the inputs and outputs. Each RTU shall be provided with the total I/O capacity as described under the Microprocessor-based controller Section later in these specifications.

## 2.4 PRODUCT SPECIFICATIONS

### A. REMOTE TRANSCEIVER UNITS / MASTER TRANSCEIVER UNITS

1. The main site and each remote location shown on the plan drawings and as described herein shall be of the PLC type with adequate memory and instruction sets required to make the unit perform all of the functions required by this specification. Units shall communicate with the Master PLC over the previously specified telemetry medium. Systems using a PC for master communications shall not be acceptable.
2. All control signals, status signals, alarm and process variable data shall be transmitted and received between the central location and the remote sites via the SCADA system. The system shall convert commands, alarms and variable analog data to digital blocks and transmit this information between the Central and the multiple remote locations. The master and remote PLCs shall be capable of stand-alone control to maintain programmed logic.
3. Units shall be furnished completely configured and tested providing the specified communication, monitoring, display, input/output, annunciation, computational and other requirements for operation of the SCADA system. Any additional components required for operation, whether specifically referenced herein or not, shall be provided.
4. The PLC system shall be based on a scalable modular multi-use open architecture platform that can be efficiently applied to perform the necessary functions at each location. Each controller/telemetry unit shall be a modular hardware style PLC consisting of a CPU with adequate memory and instructions, power supply, local and remote input/output modules, communications ports, and all other components required to make the unit perform all of the functions required in this specification.
5. It is required that the same model PLC device be used throughout the SCADA system including; RTU, MTU and IRTU (repeaters) sites providing a complete solution with one common technology. This is to insure complete system continuity, compatibility between like devices, enhancing overall system efficiency by the reduced need to learn, maintain, support and carry

spare parts for multiple technologies.

6. The PLC system shall support true system open architecture allowing use of specialized for water and wastewater hardware and software and full integration of other third party generic hardware/software devices. The architecture shall meet the requirements as herein defined and allow economical expansion of function and features based on new and evolving technologies. *Systems using non-scalable and/or closed proprietary architectures shall not be acceptable.*
7. The PLC system shall be based on a robust, field proven, current technology hardware platform allowing utilization of the latest advances in technology and permitting the most open programming and communication architectures. The PLC system shall be modular and scalable to be efficiently applied at each of the specified sites within the system.
8. The PLC system shall include a real time of day time clock w/battery back up for time stamping of data log records and scheduling of periodic time of day based events. Clock shall not require reset after a site power failure has occurred.
9. The PLC shall store system parameters including, logic configuration, setpoints, time delays, alarm and event data, counters and totalizers, etc. in field programmable (FLASH) non-volatile memory. Sufficient non-volatile memory must be provided to protect at least 8,000 variables. The PLC shall also provide enough protected memory for time stamped data logging of up to 200,000 process values. This data shall be unaffected by power interruptions.
10. The PLC shall have enough processing power and working (DRAM) memory to enable high level programs such as Internet Web Servers to operate efficiently without affecting other simultaneous multitasking operations.
11. The PLC shall be furnished with a minimum of 6 communication ports with true multitasking and allow simultaneous support of all ports. Ports can be configured for local I/O, Operator Interface/display support, LAN/WAN, etc.
12. The PLC processor shall meet the following as a minimum:
  - CPU - True 32 Bit running at 50 MHz.
  - 16 MB – 32 bit Dynamic RAM
  - 8 MB FLASH
  - 512 KB Static RAM
  - 1 (One) Ethernet 10/100 BaseT port (RJ45)
  - 2 (Two) RS-232 Serial Communications (115 KB PS) (RJ45)

- 1 (One) RS485 Serial Multi-Drop Communications
- 1 (One) Local I/O port
- 1 (One) Display Serial Communications Port

13. The PLC shall not require any specialized tools for removal of the unit. System components including PLC, power supplies, etc. shall be DIN rail mounted. Terminations shall be via plug in connectors facilitating quick field replacement.
14. PLC's and associated I/O modules shall meet national and international safety standards including UL, CSA, CE, DNV and Zone 2 Rated. In addition to the safety standards PLC system components shall also meet IEEE-472 (ANSI C37.90) surge withstand and IEC68-2-6 Vibration standards.
15. The PLC shall operate from a 10-30 VDC power source. A battery and charger as previously specified shall be supplied to power the master & remote unit during 120 Volt service power outage conditions.
16. The PLC's shall have an operational temperature range of  $-40^{\circ}\text{C}$  to  $70^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  to  $158^{\circ}\text{F}$ ) under relative humidity conditions of 5 to 95% non-condensing. Storage temperature range up to  $85^{\circ}\text{C}$  ( $185^{\circ}\text{F}$ )
17. The PLC shall have a high performance open source software architecture that utilizes a true multitasking operating system running a combination of standard and specially designed for water and wastewater application software modules. The system provided shall utilize an integrated system approach providing a comprehensive common configuration tool for all components within the system including I/O, Processor, Communications, and Operator Interface Display. The architecture shall permit all system components to be configured, simulated, tested and downloaded from one terminal to all system components.
18. The operating system shall be multitasking and allow a minimum of two separate programs to run simultaneously without affecting each other.
19. To provide for and insure multiple source support, the PLC system shall utilize industry standard programming language certified by the PLC open committee for all five languages supported by the IEC 61131-3 standard including; Sequential Function Chart, Ladder Diagram, Structured Text, Instruction List and Function Block Diagram. All five languages must be included. Any one or a combination of the aforementioned programming languages can be used to implement the system strategy. The programming software must be Windows<sup>TM</sup> based and be able to operate

on Windows™ 95, 98, NT, 2000, Millennium and XP operating systems.

20. PLC's provided under this specification shall be capable of performing the necessary logic to control the system as previously defined. These capabilities shall include, but not be limited to the following:
  1. Discrete input/output
  2. Analog input
  3. Analog output
  4. Timers
  5. Pump Controller
  6. Pump Alternation
  7. Mathematical Function Blocks
  8. Stage Blocks
  9. Trending
  10. Latch/unlatch relays
  11. Counters
  12. Comparators
  13. Ladder logic
  14. Flow Totalization/Integration
  15. Intrusion Detection
  16. Time of Day Control w/Lockout
  17. Ramp Blocks
  18. Data Logging
21. PLC's shall be capable of performing diagnostic functions. CPUs shall continuously monitor the functionality of the system and record errors and specific system events. A diagnostic buffer shall retain fault and interrupt events.
22. Communications between the Master PLC and any future SCADA computer added later shall be accomplished using standard off-the-shelf drivers allowing use of standard Windows DDE and or OPC software drivers. The PLC system configuration software shall allow the MTU tagname data base to be exported to the computer HMI software providing continuity between PLC and HMI tagnames and making future changes/upgrades more efficient and less prone to database tagname error. Communications between the Computer and Master unit and the Master unit and the remote (off-site) units shall be via high speed communications port (RS-232 (up to 115 Kbps) or Ethernet 10/100 BaseT (10/100 Mbps) in conjunction with a modem over the previously specified telemetry medium.
23. Each PLC shall have memory protected built in historical archiving/data logging of system alarms & events and process variables. Data logger shall be able to log data based on time or an event. PLC shall have enough memory allocated to allow 200,000 time and date stamped discrete and/or analog values to be archived. The historical archive shall allow the oldest data to roll off the system as memory is used keeping the 200,000 most current data points available. Process point time stamping frequency shall be selectable within the configuration software. It shall be possible for the archived data to be exported in CSV format allowing use with standard spreadsheet and data base software applications.

24. Each PLC shall have built in web server capability allowing system information to be stored in a format that allows for easy access and viewing with standard Windows™ based browser. Each unit shall be furnished with built in O & M data associated with its specific site including; as a minimum, basic system information, panel layouts, wiring diagrams, material lists w/part numbers, and operational summary. This information shall be accessible locally or remotely.
25. The PLC telemetry system shall utilize USFilter “open” industry non licensed standard communications protocol that will permit interface with other equipment that may not be supplied by the same manufacture. Protocols that are proprietary and closed ended will not be acceptable. Upon request by the end user, the system supplier shall provide, to the owner, documentation describing the supplied communications protocol so that it may be used in future telemetry additions to insure interface-ability of other third party RTUs and or PLCs.
26. The telemetry system must be able to simultaneously support multiple communications protocols. The system supplied, as a minimum shall be able to supply USFilter “open” and Modbus RTU/ASCII (Remote/Slave) output data via RS-232, 485 & Ethernet format thus insuring a primary means of interfacing with non-related equipment.
27. The PLC system shall allow telemetry operations over multiple (LAN/WAN) communication media affording the most efficient and reliable solution including; DC metallic wire pair, dedicated leased voice grade phone line, standard dial up phone line, wireless cellular dial up system, cable TV, Fiber optics, Ethernet 10/100 BaseT, VHF Radio, UHF Radio, Dedicated Microwave Radio, and Ethernet Wireless. System communication architecture can be based on any one or a combination of these media. The communications speed shall be set to the highest speed allowed by the selected media. This system shall be based on the use of VHF radio as the primary communication media.
28. The system shall support multiple modes of telemetry operation allowing highest possible system reliability and real-time response including; standard polling cycles, peer-to-peer, quiescent (Report on exception), store and forward (Repeater). System communication architecture can be based on any one or a combination of these modes of operation. This system shall utilize a combination of the above mode(s) of operation.

29. The PLC telemetry system shall employ a high level, efficient, secure communications protocol for communications between Master Telemetry Unit (MTU) and Remote Telemetry Unit(s) (RTU). As a minimum the telemetry system shall utilize BCH, CRC16 or other high level error detection/rejection protocol to ensure true transmission/reception of data. Systems utilizing communications protocols with less capable error detection/rejection capabilities shall not be suitable for this application and will be summarily rejected.
30. The PLC system shall allow local or remote configuration or RTU troubleshooting without the need to be onsite. The system protocol shall support remote upload and down load file transfers between the master unit and associated RTUs. File transfer function shall provide reliable means of remotely transferring RTU configuration files so that any RTU configuration can be uploaded through the selected telemetry communications media to the online PC via the MTU, modified and then downloaded to the RTU. The system shall support transfer of RTU historical files for recovery of historical data stored at each RTU in the event of communication or MTU failure. Historical files can be reassembled at the MTU/PC so that no loss of data occurs due to temporary communications interruptions. The Main PLC shall be supplied with a standard dial up modem allowing remote system access for factory service and technical support.
31. The PLC system shall have I/O resources to support a wide variety of applications without needing to depend upon alternate technologies to meet various system data requirements. Each PLC shall be supplied with the required I/O to meet the specified requirements and allow for a minimum of 100% spare capacity for future expansion. The PLC system shall be easily scaled from a stand alone unit capable of supporting up to 1,024 local, 1,024 remote I/O, and 10,000 Ethernet networked I/O points or one of 254 RTUs with a total system data handling capability of 50,000 points.
32. The PLC system shall support a wide variety of modular I/O with various configurations to permit the most efficient use of I/O hardware and panel space. I/O modules shall be available for local I/O (within control panel), remote I/O (RS-485 based distributed outside of the control panel) and Ethernet based I/O (Distributed I/O on high speed in plant network or wireless Ethernet). Each I/O module shall be DIN rail mounted, have compression wire type terminals capable of accepting 14 AWG wire, have wire identification markers and I/O wiring diagram. Each module shall include diagnostic LEDs indicating module operational and I/O status. Each I/O module shall be electrically isolated, meet IEEE-472 (ANSI C37.90) surge withstand certification, shall be removable under power and easily field replaced with a spare module requiring no software/hardware

reconfiguration adjustments. Each module shall be safety keyed to insure proper installation. I/O modules shall permit installation and operation in hazardous locations as classified under UL, CSA Class 1, Div. 2, Groups A, B, C & D.

33. Local I/O modules shall be connected to the PLC by a dedicated high speed serial communications port and shall allow local networking of 128 I/O modules for a total of 1024 I/O points via 2 twisted shielded wire pairs separated by up to 50 Ft. Local I/O to PLC update time shall not exceed 150 mS.
34. Remote I/O modules shall be connected to the PLC by a dedicated high speed isolated serial communications port and shall allow networking of 32 I/O modules directly or with up to 4 gateway I/O expansion modules allow 128 I/O modules for a total of 1,024 I/O points via RS-485 multidrop communications network separated by up to 10,000 ft. Remote I/O modules shall support multiple communications protocols including Modbus ASCII and RTU allowing connection to any device supporting these protocols.
35. Ethernet I/O modules shall be connected to the PLC by on board Ethernet 10/100 BaseT connection port. Ethernet I/O modules shall support multiple communications including TCP/IP and Modbus ASCII and RTU allowing connection to any device supporting these protocols over standard Ethernet backplane.
36. Master & Remote PLCs shall be IntraLink LC3000/LC2000 as manufactured by Siemens Industries or pre-approved equal.
37. An Operator Interface/Keyboard Display shall be supplied for the Master PLC and Remote PLC's and is to be mounted on the door of the enclosure. Keypad/Display shall allow the Operator to view and modify system variables within the PLC. Keypad/Display shall be NEMA 4 rated, have 20 system/function keys with tactile feedback, and have a minimum of 64 x 128 pixels capable of displaying graphics and a minimum of 8 lines with 20 characters per line. The display shall be a high contrast backlit LCD display so that it is unaffected by a wide range of ambient light conditions.
38. Operator interface shall have sufficient performance to permit real time updates of system data and shall be capable of display update at least 3 times per second. Operator initiated screen change shall occur within 50 mSec. The display shall incorporate a power save feature that shuts down the display after 5 minutes of keyboard inactivity.

39. The system display shall be preconfigured to reflect system parameters. The display shall support a minimum of 50 customizable main level process system displays. These displays shall be configured with graphical and text based data for the specific application to meet system monitoring and process control needs. The display shall be easily navigated by using a simple menu type format branching down to sub menus/levels. The display shall allow an operator to return to the main level with a one step push button entry. All system data and parameters shall be security protected. The system shall employ a hierarchal security password system affording a minimum of three (3) levels of password protected access to the system.
40. The display system shall incorporate a basic trending package that shall allow sixty samples of time based data for a single discrete or analog based data point to be displayed. The system shall allow trend display of any data point in the system.
41. The display system shall be able to display current and historical alarms and events. Upon the occurrence of a new unacknowledged alarm, the display shall show the date and time and sound an audible tone indicating the presence of an unacknowledged alarm. Acknowledging the alarm via the display keyboard shall silence the audible tone. Subsequent alarms shall reactivate the alarm audible tone. Historical alarm and event information shall be viewable from the display with the last 1,000 alarms or events including date and time of alarm being available.
42. The Operator Interface shall provide locally viewable system diagnostics for the PLC system to permit an on site method of troubleshooting the system without the need for specialized tools or knowledge. Diagnostics indicating system processor and communication errors and CPU performance/loading shall be viewable when in this mode.
43. Unit shall be capable of displaying process variables, provide management and processing of status and fault messages, and provide process control using soft keys, function keys or system keys. Keypad/Display programming shall be via Microsoft Windows based software as described above in the software section of this specification.
44. The operator interface shall also display booster pump hand-off-auto selector switches for remote operation of all water booster stations.

## B. ENCLOSURES

1. The described MTU and RTU equipment shall be housed in U.L. listed enclosures properly sized to accommodate all control elements. Appropriate NEMA type enclosures shall be provided to meet the particular



environmental requirements of each location as herein specified.

2. NEMA 1 The described MTU shall be housed in a U.L. listed NEMA 1 mounted enclosure properly sized to accommodate all control elements. The enclosure shall be constructed of not less than 14 gauge cold rolled steel. The enclosure shall have an ASA 61 gray polyester powder coating inside and out over phosphatized surfaces and shall include the following features:
  - a. All of the seams shall be continuously welded and ground smooth with no holes or knockouts
  - b. Door and body stiffeners shall be provided for extra rigidity
  - c. Captive door screws thread into sealed wells
  - d. Heavy gauge continuous hinge
  - e. Removable and reversible print pocket
  - f. Oil resistant gasket and adhesive
  - g. Collar studs shall be provided for mounting inner panel
  - h. Inner panel shall be painted white enamel
3. NEMA 4X Fiberglass The described tank RTU equipment shall be housed in a U.L. listed NEMA 4X fiberglass gasketed, wall mounted enclosure properly sized to accommodate all control elements. The enclosure shall be constructed of molded fiberglass with corrosion resistant stainless steel hinges.

C. PRESSURE / LEVEL TRANSDUCERS (Item G, 9 ea.)

1. The level of the storage tanks and booster station suction and discharge pressures shall be sensed by a 2-wire, 4-20 ma DC pressure transmitter, mounted within a NEMA 4X fiberglass enclosure, including a pre-piped pressure gauge and shut-off and bleed valves.
2. The transmitter shall be in conformance with the following industry standards:

EN61326:1997+A1:1998, EN55011:1998, EN61000-4-2:1995, EN61000-4-3:1996,  
EN61000-4-4:1995, EN61000-4-5:1995,  
EN61000-4-6:1996, EN61000-4-8:1993,  
EN61000-4-11:1994, EN45014
3. The Manufacturer must be certified as meeting the requirements of ISO 9001

4. The transmitter shall be suitable for the following environmental conditions:
  - a) Humidity: 0 to 100% relative humidity
  - b) Ambient temperature limits: -40 to 185° F (-40 to 85° C)
5. The transmitter shall be suitable for liquid, gas or vapor service. The pressure limits of the transmitter shall be a minimum of twice the upper range limit of the transmitter selected for this project.
6. The transmitter shall operate from 10.5 to 36 volts DC with no load. The power supply shall originate from the RTU or MTU panel.
7. The transmitter shall be available in ranges from 0 to 1 psi to 0 to 1,000 psi.
8. The transmitter shall meet the following performance criteria:
  - a) Accuracy: +/- 0.25% of calibrated span
  - b) Stability: +/- 0.10% of upper range limit for 12 months for smart output
  - c) +/- 0.25% of upper range limit for 12 months for analog output
  - d) Vibration: 20 g
9. The transmitter shall be mounted within a NEMA 4X enclosure that shall also house shut-off and bleed valves that are mounted in the bottom of the enclosure using brass bulkhead connections. A 3-1/2" pressure gauge shall also be mounted in the enclosure and pre-piped to the transmitter and shut-off/bleed valves prior to shipment and installation.

#### D. RADIO TELEMETRY EQUIPMENT

1. Integrated radio modem hardware that complies with applicable FCC or NTIA requirements for refarming shall be supplied. The radio and the modem must be packaged together and internally interfaced with each other. On-line, non-intrusive RF network diagnostic monitoring shall be provided as a standard feature in the system architecture.
2. Radio modem hardware of a 'packetized' design may not be used. Units shall be data transparent to allow for a minimum amount of data transmission latency and to limit data transmission overhead, thus allowing the radio modem to obtain the data rates specified.
3. Keying of radio modem hardware may be accomplished by either RTS signaling or data activated transmit. Data can be presented to radio modem hardware for transmission when the Data Activated Transmit or DOX mode is selected.

4. The radio modem hardware must be protocol transparent and independent. It must support 7 or 8 data bits, 1 or 2 stop bits, even, odd, or no parity. The master or base unit will operate within the 132-174 MHz frequency band. The master unit must be 100% transmit duty cycle capable.
5. Front panel mounted status indicators shall be available for status monitoring. Separate data ports must be provided for both application data and for on-line, non-intrusive diagnostic monitoring. The unit shall have type acceptance for operation at 9600 bps within a 12.5 kHz bandwidth. To comply with this requirement, unit must carry a 9K30F1D FCC emission designator or better.
6. Transmission requirements include:

Bandwidth:

132-150 MHz – 18 MHz Bandwidth

150-174 MHz – 24 MHz Bandwidth

This must be accomplished without re-tuning of the radio.

RF Output Power of at least 5 watts, and must be adjustable down to 1 watt, and any level in between.

Duty Cycle:

50% at 5 watts; 30 second Maximum Transmit.

Frequency Stability:

2.5 ppm between -30 to +60 Celsius

Spurious/Harmonic Emissions:

-63 dBc (Per TIA/EIA)

FM Hum and Noise:

-40 dB at 12.5 kHz (Psophometrically weighted per TIA/EIA.)

Transmitter Attack Time:

Less than 7 ms per TIA/EIA measurement standards.

Modulation Type:

Frequency Modulation, DRCMSK

RF Output Impedance:

50 Ohms

**Time-Out Timer:**

Programmable up to 60 seconds via PC programming interface.

**RTS-CTS Delay:**

Between 20 and 32 ms at 9600 bps data rate.

**7. Receiver requirements include:****Type:**

Dual conversion, superheterodyne.

**Frequency Stability:**

1.5 ppm from -30 to +60 Celsius.

**Overall Sensitivity: (at antenna input port)**

9600 bps RS-232 interface: 1.0  $\mu$ V for  $1 \times 10^{-5}$  BER @ 12.5 kHz

Sensitivity specification must take into account the sensitivity of both the radio and the modem portions of the radio modem.

**Selectivity:**

65 dB at 12.5 kHz

**Intermodulation:**

75 dB (Per TIA/EIA)

**Spurious and Image Rejection:**

75 dB (Per TIA/EIA)

**FM Hum and Noise:**

-40 dB at 12.5 kHz (Psophometrically weighted per TIA/EIA.)

**Conducted Spurious:**

-57 dBm (Per TIA/EIA)

**RX Attack Time:**

Less than 7 ms per TIA/EIA measurement standards.

**Bandwidth:**

132-150 MHz – 18 MHz Bandwidth

150-174 MHz – 24 MHz Bandwidth

This must be accomplished without re-tuning of the radio.

**RF Input Impedance:**

50 Ohms

## 8. General requirements

### Data Port:

A DE-15 High Density Female Connector must be provided for use as either a Data Communications port or as an off-line diagnostic access port.

### Input Power:

10 TO 16 VDC, Power connections shall be pins within the previously referenced DE-15 High Density Female Connector.

### Status Indicators:

LED display to indicated Receiver Carrier Detect, Transmit, and Power

Unit must be frequency synthesized and operate on the following synthesize step so that all FCC re-farmed frequencies can be synthesized: 2.5kHz.

Must support the Dataradio "DI-OS" Interface Standard.

Meet the following physical requirements:

RF connectors must be Type SMA.

### Design:

The radio design shall make use of surface mount PC board components.

### Humidity Range:

0 to 95% relative humidity, non-condensing.

### Size:

The radio modem unit mounting must fit within a space 3" wide by 4.75 " in length.

## 9. Diagnostic Capabilities

The remote unit must be frequency synthesized and programmable to all frequencies by means of a personal computer running proper radio service software. All operational parameters must be accessible via programming software. It shall not be necessary to open radio housing to accomplish programming or setup.

The following radio parameters must be accessible through the programming software:

- Enable/Disable On-Line Diagnostics
- PTT Watchdog
- Carrier Detect On/Off Levels
- Receive and Transmit Frequencies
- Modem Version
- ID Number; Long ID Number
- Enable/Disable Dynamic Carrier Detect
- Extended Turnoff
- Date of Last Configuration
- Over the Air Data Rates
- Total # of Programming Configurations
- Data Word Length
- Independent RF Power Level Adjust for each channel

10. Unit must support diagnostic capabilities described and outlined in section 2.5 above. Units must originate diagnostic information and send over the air whether in On-Line or Off-Line diagnostic mode.
11. The radio modems shall be Calamp Integra TR VHF or equal.
12. Antenna Systems shall be furnish and installed for each transceiver. Mount antennas on wood poles, self-supporting steel towers or masts as shown on the plan drawings or as required for reliable signal transmission. All antennas and supporting structures shall be designed to withstand a 100 Mph wind with a 1/4" coating of ice. Remote antennas shall be a 3-element Yagi array with a gain of at least 7 db. Each radio telemetry unit shall be provided with a bulkhead-type antenna/cable lightning arrestor, required length of LMR-400 coaxial cable and all required connectors.
13. The system supplier shall be responsible for obtaining or modifying the FCC station and operating licenses for the owner. This shall include performing a path study based on data provided to the system supplier by the owner/engineer. This information shall include:
  - a. Area topographic maps
  - b. Site names/locations and addresses
  - c. Site ground and building/pole elevations
  - d. Latitude and Longitude for each site
  - e. Approximate path length

14. The system supplier shall be responsible for the following:
  - a. Obtain FCC approval for system operation
  - b. Prepare all materials required by the FCC
  - c. Obtain all license application forms, write in all required information and forward to the owner for signature(s)
  - d. Provide all information required by the area frequency coordinator

E. COMPUTER HARDWARE

1. The main computer hardware system shall consist of a CPU, ram memory, hard disk storage drive, CD-ROM R/W, video boards, network adaptors, audio boards, keyboard, mouse, monitor and an external direct connect telephone modem. The unit shall contain auxiliary microprocessors which handle all data manipulations and memory allocations. A video monitor and printers shall be included to view and print data. A minimum of 5 PCI/1 AGP slots, 2 serial, 2 USB and 1 parallel ports shall be provided. All computer hardware must be listed on the Windows 7 compatibility list published by Microsoft Corporation.
2. Power provided to the computer and its peripherals will be 120 vac, 3 wire, 60 Hz. Computer shall be capable of operating satisfactorily in an ambient temperature range of 60 to 90 degrees Fahrenheit with a relative humidity of 5 to 85% non-condensing.
3. All necessary communications and power cabling and or cords between the PC, Master PLC, UPS and all peripheral equipment shall be included. Surge protected power shall be provided by the CONTRACTOR.
4. The computer shall be 32 bit and IBM-at compatible. CPU shall be an Intel Pentium 4, 1.5 GHz or better. CPU shall utilize a 256k cache. Basic configuration shall include 128 mb sdram. Data bus width shall be 64 bit. Computer shall be FCC class b certified for EMI/RFi and UL/CSA approved.
5. The computer shall have an integrally mounted fixed disk system, 48x CD-ROM, 24x CD RW, and a controller card to interface the drives to the CPU. Hard disk shall contain as a minimum 20 GB of formatted data storage with a single partition of memory. Drive shall utilize a voice coil actuator for read/write head positioning. Maximum allowable access time shall be 12 ms.
6. The main video display system shall be able to display alphanumeric data, pixel and vector graphics. Both text and graphics shall be able to be displayed on the screen simultaneously. A super video graphics array SVGA

video adapter card shall be provided. Board shall include a minimum of 2 MB video memory and capable of displaying 1024 by 768 resolution graphics in 256 colors. Average drawing time of a display with graphics shall be less than five seconds. A 17" color flat panel monitor shall be provided with each PC. The unit's dot phosphor pitch shall be a maximum of 0.28 mm. Screen shall be designed to minimize glare and increase contrast.

7. A desktop inkjet printer shall be provided to serve as a report printer. Printer shall utilize a high speed USB or parallel interface. Unit shall be capable of 12 pages per minute black & white and 10 page per minute color printing, and capable of 2400x 1200 dpi resolution.
8. An uninterruptible power supply (UPS) shall be furnished for each PC to continuously provide a reliable source of power to the Master PLC, computer and peripherals. Unit shall provide non-break sine wave power, lightning and surge protection, isolation per FIP standard 94, voltage regulation and be switch mode power supply rated. Standby power supplies which allow a break in power when transferring to battery are not acceptable. The UPS shall be sized to accommodate 125 percent of the maximum load of the PC, monitor, and local peripherals. UPS shall utilize sealed maintenance free batteries to provide a minimum of 20 minutes of backup power at full load in the event of a failure of the normal AC source.
9. The operating system for the main computer shall be commercially available, 32-bit and capable of taking full advantage of protected mode multitasking capabilities of a Pentium IV microprocessor. System shall be designed to perform advanced memory management functions. Operating system shall be Windows Windows 7.

#### F. COMPUTER SOFTWARE

1. A complete functional and operational software system shall be provided within the HMI that is compatible with the specified SCADA system hardware and meets the specified functions and performance requirements described. Specific software requirements are detailed hereinafter.
2. The software system shall be standard product as defined herein that is fully developed and supported. It shall be installed and in operation at other facilities of a similar nature to this one and be a regularly sold product as configured by the Supplier. All operating system, compilers, loaders and other computer vendor-supplied software used to support applications activities shall be standard products.



3. All software shall be designed such that any anticipated process system growth can be accomplished without need for additional computer hardware. Sufficient space must be allocated in software to allow for listed future and spare I/O, for additional CRT displays and for additional/expanded report logs.
4. The system shall be user configurable within the limits of spare data base points, report pages and displays. Modifications to the data base and system configuration shall be possible while the system is on line. No special programming knowledge is required to implement these functions.
5. The system shall provide simple "point and click" ease of use through the supplied mouse pointing device. It shall be possible to view and configure the system *without any typing on the system keyboard*. All displays shall make full use of the supplied PC's multi-color, high resolution graphics capability to provide maximum user comprehension of the monitored data. The operators workstation shall be capable of displaying the following as a minimum:
  - a. An "Open Window" menu, listing all available displays.
  - b. Alarm summary displays.
  - c. A System Overview graphic display "map" screen
  - d. A site specific graphic display for each RTU in the system
  - e. A graphic display for the data monitored locally by the MTU
  - f. Historical trending display with the ability to set up individual trends
  - g. Level Summary Report
  - h. Flow Summary Report
  - i. Equipment Run Time Report
  - j. Alarm Grouping display
  - k. A control setpoint display for all monitored analog signals
  - l. Tool bar with screen shortcut icons, forward and back buttons
6. All displays shall be pull down type in that the CRT displays a series of menus and commands. The commands, when selected, produce screen displays or menus with additional commands. These commands and displays direct the flow of information to the screen displays and other functions of the computer system.
7. The software package to be supplied shall meet or exceed the intent of all aspect of these specifications. The software shall be Ignition by Inductive Automation or equal. All documentation, disks, manuals and software licenses shall be turned over to the city upon acceptance of the system.

8. All digital “pump” required outputs shall contain an HMI “Hand-Off-Auto” selector switch on the site specific screen for operator control of each output from the HMI computer.
9. The PC shall provide graphic animation of incoming data to facilitate quick identification of process values and alarm status. This animation should include dynamic changes to graphic colors, sizes, vertical/horizontal percent fill, vertical/horizontal sliders, rotation and visibility. Dynamic system graphic displays shall be provided and displayed on the system CRT. Actual graphic displays shall be submitted for Engineer's approval. As a minimum, graphic displays shall be provided for the following.
10. A "map"-type system overview display, showing all locations monitored by the SCADA system. Each remote location shall be depicted and have common alarm indication. In addition, the pump stations shall show digital level and flow indication if available. By selecting a particular location with the mouse the operator shall be able to zoom in to view more detailed information specific to that site.
11. A site-specific display, showing information transmitted from each remote station. Each of these displays shall include dynamic graphic depictions of the on-site equipment. A dynamic level display shall be provided for each water storage tank. All site-specific alarms shall be provided. A miniature six-minute trend snapshot shall be provided for all level and flow signals.
12. The system software configuration shall include a graphic display that shall provide a list showing each remote location with communications information to aid in troubleshooting the system. The communications efficiency summary shall list each remote location and it's communications efficiency as a percentage. The communications efficiency information shall be presented as a trend graphic display and in tabular format.
13. Each analog signal shall be shown digitally in engineering units (level in feet, flow in GPM or MGD, etc.) and as a dynamic graphic vertical bargraph proportionate to the actual level. Adjacent to the bargraph shall be two keyboard-configurable numeric fields for high and low alarm setpoints.
14. The alarm monitoring system shall detect alarm conditions for discrete and analog variables. The alarming features shall include up to 999 alarming priorities.

15. An alarm priority shall be designated for each alarm point, critical or non-critical. Annunciation delay shall be user modifiable. Up to five (5) separate alarm conditions shall be monitored for each point. These shall be: rate of change alarm, major/minor deviation on low-low alarm, low alarm, high alarm and high-high alarm. An alarm dead-band to prevent a signal from oscillating in and out of an alarm condition shall be user modified.
16. Alarms shall be capable of being assigned to Alarm Sections permitting grouping of various facilities or locations into separate alarm group displays.
17. Acknowledgment of an alarm through the PC's keyboard shall also acknowledge the MTU's audible alarm device. Conversely, acknowledgment of an alarm at the MTU shall be input into the alarm software and accepted as an alarm acknowledgment by the PC.
18. When an alarm occurs, a message will be indicated on the CRT indicating the date and time of the occurrence, point ID, point description, condition or value and the limit which was violated. A similar alarm message will be added to the Alarm Summary Display. When an alarm occurs, the message will blink and a tone will sound in the master control station until it is acknowledged by selecting the Alarm Silence command. Selecting Alarm Silence will also cause an alarm acknowledgment to be printed.
19. When an alarm condition clears, a return to normal message will indicated and the alarm message will be removed from the current Alarm Summary Display. Alarms shall be able to be linked to process graphics symbols so that the graphic display will dynamically change color when an alarm condition occurs.
20. Alarm handling shall be provided as part of the HMI. Digital inputs shall be definable as alarm or status events. Analog alarms shall be generated when the parameter is outside a user specified range. All alarms shall be capable of being displayed, logged to disk or printed.
21. An Alarm Dialer Interface shall be provided, and integrated into a software alarm dialout package provided by and installed by the supplier. It shall be possible to configure all system alarms to input any of the alarm dialer software from the PC's keyboard via simple point and click operations. The alarm dialer software shall be Win911 or equal.
22. The Trending Display shall allow multiple point trend displays which show up to eight (8) analog signals for the system plotted against time. Through the PC the Operator can select any analog value that is currently being monitored by the computer for inclusion in the display. Each analog value

can be displayed in a different color. The vertical scale on the display shall change to represent the actual displayed analog's engineering units. Each display shall indicate range and current value of each signal. There shall be no limitation on number of charts per screen or per application.

23. Flexibility in trending time periods (e.g.: minutes, hours, and days intervals) shall be provided. Trends shall also be able to Export/Import historical data in \*.csv format to and from spreadsheets, other databases and editors.
24. The PC's internal modem shall be provided with remote access software. The remote access software will allow an offsite computer to operate and monitor the system remotely and provide remote uploading/downloading of files. The software shall be TeamViewer Vers. 9.0 or higher.
25. The PC software shall include Microsoft Excel with Historian DDE extensions to allow manual graphing/reports of trended information.
26. The HMI shall have the capability to support DDE and I/O Server Interfaces not less than sixty (60) programmable controllers and dedicated RTU protocols, including:

Allen-Bradley 1784-KT/KF2 via Data Highway/Data Highway Plus

GE Genius/CCM2

Modicon Modbus/Modbus Plus

Opto 22 Optomux

TI TIWAY/Direct (RS232)

Reliance Automate

Square D SY/MAX, SY/NET

Sutherland-Schultz 5136-SD

Micronetics BIT BUS

Transition Technology DDE

Radysis VME Bus DDE

Omron Hostlink DDE

Datavision Bar-Code Scanner DDE

Bailey Automation SECS Protocol (via BIT BUS)

Consolidated Electric D620i/SBC Controller/RTUs

#### G. NOTEBOOK COMPUTER

1. The CONTRACTOR shall furnish one (1) laptop computer with the above specified remote access software installed to allow the operator remote access connection to the PC for remote control and alarm acknowledgment. The laptop computer shall meet the following specifications as a minimum:

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Supervisory Control and Data Acquisition (SCADA) Equipment and Instrumentation

- a) Pentium 4 processor or latest
- b) Minimum of 2 USB ports
- c) Wireless internet access card
- d) 15 inch LCD screen display
- e) 74 WHr lithium Ion battery
- f) Removeable CD/RW drive and 3.5" disk drive
- g) 52k internal fax/data modem
- h) Windows Vista or XP operating system
- i) Ethernet port

H. FLOW METER PARTS AND MISCELLANEOUS INSTRUMENTATION

1. The Limestone Master Meter station shall be furnished with Neptune ECR registers that mount in the existing register stack on the 6" and 2" turbine water meters to provide both a flow rate and flow total pulse to the Brannon BPS/Limestone MM RTU panel PLC.
2. A Dry Well Float Switch shall be furnished to automatically detect high liquid level in the underground booster or valve stations at the locations noted in the specifications and I/O tables. A liquid rise of 3/8 inch from the rest position shall operate the float switch and shall reset when the liquid level drops 1/4 inch.
3. This float switch shall be a Model 101G as manufactured by Siemens Industries or equal. It shall require no adjustments and need no calibration. Circuit operation under submergence, pressure or following long-term inactivity shall be reliable. Installation shall be in accordance with project plans and manufacturers' instructions.

**RTU INPUT-OUTPUT TABLES****LOCATION – LOWRY BOOSTER STATION RTU-1**

<b><u>I/O DESCRIPTION</u></b>	<b><u>I/O TYPE</u></b>	<b><u>I/O SOURCE</u></b>
Booster Pump #1 Run	DI-1	Pump Starter Aux. Contact
Booster Pump #2 Run	DI-2	Pump Starter Aux. Contact
Power Fail	DI-3	Battery Charging Relay
Pump #1 Switch in "Auto"	DI-4	Aux. block on H-O-A switch
Pump #2 Switch in "Auto"	DI-5	Aux. block on H-O-A switch
Station Flood	DI-6	Dry Well Float Switch
Flow Total Pulse (1 per 1,000 gal)	DI-7	Future for this location
Spares	DI-8 thru 12	Spares
Station Flow (gpm)	AI-1	Existing flow meter
Station Suction Pressure (psi)	AI-2	New Pressure Transducer Panel
Station Discharge Pressure (psi)	AI-3	New Pressure Transducer Panel
Pump #1 Start	DO-1	RTU Output relay
Pump #2 Start	DO-2	RTU Output relay
Spares	DO-3 and 4	Spares

**LOCATION – WATER STORAGE TANK RTU'S***(Groggins Ferry Tank RTU-2, Eisenhower Tank RTU-4, and Brannon Tank RTU-6)*

<b><u>I/O DESCRIPTION</u></b>	<b><u>I/O TYPE</u></b>	<b><u>I/O SOURCE</u></b>
Tank Level (ft.)	AI-1	Pressure/Level Transducer
Spares	AI-2 and 3	Spares
Tank Mixing System Run	DI-1	Relay from Mfgr Panel
Spares	DI-2 thru 12	Spares
Spares	DO-1 thru 4	Spares

**LOCATION – INDUSTRIAL PARK VALVE STATION RTU-3**

<b><u>I/O DESCRIPTION</u></b>	<b><u>I/O TYPE</u></b>	<b><u>I/O SOURCE</u></b>
Valve Open	DI-1	Valve Limit Switch
Power Fail	DI-2	Battery Charging Relay
Valve Switch in “Auto”	DI-3	Aux. block on H-O-A switch
Station Flood	DI-4	Dry Well Float Switch
Flow Total Pulse (1 per 1,000 gal)	DI-5	Future for this location
Spares	DI-6 thru 12	Spares
Station Flow (gpm)	AI-1	Existing flow meter
Station Suction Pressure (psi)	AI-2	New Pressure Transducer Panel
Station Discharge Pressure (psi)	AI-3	New Pressure Transducer Panel
Valve Open Command	DO-1	RTU Output relay
Spares	DO-2 and 4	Spares

**LOCATION – BRANNON BOOSTER/ASH TREE METER STATION RTU-5**

<b><u>I/O DESCRIPTION</u></b>	<b><u>I/O TYPE</u></b>	<b><u>I/O SOURCE</u></b>
Booster Pump #1 Run	DI-1	Pump Starter Aux. Contact
Booster Pump #2 Run	DI-2	Pump Starter Aux. Contact
Power Fail	DI-3	Battery Charging Relay
Pump #1 Switch in “Auto”	DI-4	Aux. block on H-O-A switch
Pump #2 Switch in “Auto”	DI-5	Aux. block on H-O-A switch
Station Flood	DI-6	Dry Well Float Switch
6” Flow Total Pulse (1 per 1,000 gal)	DI-7	New Meter ECR
2” Flow Total Pulse (1 per 1,000 gal)	DI-8	New Meter ECO
Spares	DI-9 thru 12	Spares
6” Meter Flow Rate (gpm)	AI-1	New Meter ECR
2” Meter Flow Rate (gpm)	AI-2	New Meter ECR
Station Suction Pressure (psi)	AI-3	New Pressure Transducer Panel

Station Discharge Pressure (psi)	AI-4	New Pressure Transducer Panel
Spares	AI-5 and 6	Spares
Pump #1 Start	DO-1	RTU Output relay
Pump #2 Start	DO-2	RTU Output relay
Spares	DO-3 and 4	Spares

**LOCATION – BRANNON CROSSING MASTER METER STATION RTU-7**

<u>I/O DESCRIPTION</u>	<u>I/O TYPE</u>	<u>I/O SOURCE</u>
6" Flow Total Pulse (1 per 1,000 gal)	DI-1	New Meter ECR
2" Flow Total Pulse (1 per 1,000 gal)	DI-2	New Meter ECO
Spares	DI-3 thru 12	Spares
6" Meter Flow Rate (gpm)	AI-1	New Meter ECR
2" Meter Flow Rate (gpm)	AI-2	New Meter ECR
Spares	AI-3 thru 6	Spares
Spares	DO-1 thru 6	Spares

(Note: I/O type designations: AI = analog input, AO = analog output, DI = digital input, DO = digital output)

**2.5 TEST EQUIPMENT/SPARE PARTS**

- A. The CONTRACTOR shall furnish test equipment necessary for checking field operation of electronic equipment furnished under this Section as follows:
1. One (1) portable (DMM) digital multimeter with rechargeable battery, test leads, and carrying case equal. Unit to measure at a minimum DC volts, AC volts, ohms, and DC milliamps
  2. One (1) spare radio transceiver
  3. One (1) spare pressure transducer sensor
  4. One (1) spare MTU PLC
  5. One (1) spare RTU PLC



## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. CONTRACTOR shall examine areas and conditions under which instrumentation and control equipment is to be installed and notify OWNER in writing of conditions detrimental to proper completion of the work.

### **3.2 INSTALLATION OF INSTRUMENTATION AND CONTROL EQUIPMENT**

- A. CONTRACTOR shall install instrumentation and control system components and ancillary equipment as indicated, in accordance with equipment manufacturer's written instructions, and with recognized industry practices, to ensure that instrumentation and control equipment complies with requirements.
- B. CONTRACTOR shall coordinate with electrical work, including raceways, conduits, electrical boxes and fittings, as necessary to interface installation of instrumentation and control system work with other work.
- C. CONTRACTOR shall tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standards 486A and 486B.
- D. Master Meter Vaults
  - 1. CONTRACTOR shall penetrate existing master meter vaults with 1" conduit, sealed with grout. Conduit shall run directly to a wall mounted junction box as described elsewhere.
  - 2. Registers shall be installed such that the existing Kentucky American Water (KAW) register remains on top of the stack and clearly visible for manual reading.
  - 3. The only loose cable that shall be acceptable is from the junction box to the newly installed register. No other loose cable shall be left inside the vault.
  - 4. CONTRACTOR shall document the condition of the existing vaults prior to beginning work by means of digital video and still photography to be submitted to the ENGINEER.
  - 5. CONTRACTOR is required to coordinate with Mr. Bryan Siler, of KAW, at 859-268-6350 or 859-537-0749 and [bryan.siler@amwater.com](mailto:bryan.siler@amwater.com) prior to commencing any construction activities at either master meter vault.

**3.3 GROUNDING**

- A. CONTRACTOR shall provide equipment grounding connections for lighting control equipment as indicated and/or required. Tighten connectors to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounding.

**3.4 FIELD QUALITY CONTROL**

- A. Upon completion of installation and after system has been energized, CONTRACTOR shall demonstrate capability and compliance of system with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting. Testing and retesting at no cost to OWNER.

**3.5 PERSONNEL TRAINING**

- A. Personnel Training: CONTRACTOR shall train OWNER's personnel in procedures for starting-up, testing and operating instrumentation and control system equipment as follows:
  - 1. Furnish the services of an experienced engineer for a period of not less than three (3) eight (8) hour working days at the site to answer questions regarding installation and interconnection of the various system components related to this Section.
  - 2. Furnish the services of an experienced engineer for a period of not less than two (2) eight (8) hour days to assist the OWNER's personnel in the initial start-up of the system and train OWNER's personnel in the proper operation of the equipment.

END OF SECTION

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**SECTION 11730**  
**Submersible Mixer**

**PART 1 – GENERAL**

**1.1 SCOPE**

- A. This section covers submersible tank mixing systems up to 0.5 HP in size intended for continuous use while submersed in potable water storage tanks. Each mixer shall have the ability to function continuously on a year-round basis, regardless of drain and fill cycles. Each mixer shall consist of a low-voltage, water-filled submersible motor, an impeller and a non-submersible control center that houses all control electronics.

**1.2 REQUIREMENT**

- A. CONTRACTOR shall furnish and install submersible mixing system together with all drives, motors, controls, conduit, wiring and any other accessories or appurtenances necessary for a complete and operable system. OWNER will provide no materials, equipment or labor to the CONTRACTOR to complete the required work. All material, labor and equipment costs shall be included in the CONTRACTOR's Bid.
- B. CONTRACTOR shall furnish electrical conduit, and any necessary wiring, with 110-120 VAC, GFCI-protected disconnect switch or circuit breaker up to the point of installation of the mixing system control center. CONTRACTOR shall also provide conduit from control center to tank penetration for submersible motor cable and penetration through tank for same cable.

**1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS**

- A. Comply with the applicable reference specifications as specified in the General Requirements

**1.4 CONTRACTOR SUBMITTALS**

- A. NSF Certification
  - 1. Copies of the NSF-61 certified listing for all material being placed inside the tank and headspace, including the motor power cable.

- B. Design Calculations
  - 1. Based on models validated and/or calibrated with experimental data from laboratory-scale and real scale representative systems for similarly-sized reservoirs, manufacturer shall show completely mixed conditions for equipment configuration. The manufacturer shall provide documentation of the Computational Fluid Dynamics (CFD) model parameters and assumptions, tank geometry and dimensions considered, mesh information, and CPU time required.
  - 2. Analysis should include the following sections:
    - a. Velocity vectors and contour plot at different cross-sections
    - b. The average flow induced throughout the tank
    - c. The corresponding average turnover for the tank (in hours)
    - d. The corresponding average power consumption of the mixer
- C. Installation, Operations, and Maintenance Manuals shall be obtained from the equipment manufacturer and submitted. The following sections shall be included:
  - 1. General equipment specifications and data sheets
  - 2. Installation, start-up, operation, and maintenance instructions
  - 3. Factory-recommended maintenance schedule and list of recommended spare parts
  - 4. Wiring diagrams specifying what electrical wiring needs to be done onsite during and prior to the installation, and by which responsible party
  - 5. List of equipment or tooling necessary for diagnostics, troubleshooting, repair or general maintenance

## **1.5 QUALITY ASSURANCE**

- A. Each mixing system shall be tested prior to deployment according to standard engineering practices at the factory testing facilities. Certification of this completed testing shall accompany mixer installation documentation.

## **1.6 WARRANTY**

- A. For the period of time beginning with formal written acceptance of the finished project by the OWNER/ENGINEER and ending on the time periods listed below, the Product shall be warranted to be substantially free from defects in material and workmanship by the CONTRACTOR

1. Two (2) years on all supplied parts and material
  2. One (1) year on all labor
- B. Warranty does not cover damage due to: (i) lightning, flood or other acts of nature, or failure of or inappropriate application of peripheral devices including lightning or surge protectors; (ii) negligence of OWNER or any third party; (iii) vandalism or any other misuse or mistreatment of the product.

## **PART 2 – PRODUCTS**

### **2.1 PERFORMANCE**

- A. Based on models validated and/or calibrated with experimental data from laboratory-scale and real scale representative systems for similarly-sized reservoirs, manufacturer shall show mixing system to have an output flow-rate that is equal to, or larger than, the following:
1. For tanks larger than 500,000 gallons in volume, mixer shall output at least 10,000 GPM
- B. In addition, mixing system shall completely mix reservoir according to the following minimum performance requirements. These requirements can be measured and validated after installation by operators with readily-available tools such as temperature probes and total chlorine grab samplers.
1. Temperature Uniformity  
For tanks larger than 80 feet in height or 500,000 gallons in volume: All temperatures shall converge to within 0.2°C within 72 hours after mixer is installed and activated. During continuous operation of the mixer, all temperatures will converge to within 0.2°C at least once every 24 hours.
  2. Disinfectant Residual Uniformity  
For tanks larger than 80 feet in height or 500,000 gallons in volume: Disinfectant residual within top five feet of tank and bottom five feet of tank will converge to within 0.20 ppm within 7 days after mixer is installed and activated. During continuous operation of the mixer, disinfectant residual will converge to within 0.20 ppm at least once every 72 hours.

## 2.2 GENERAL

- A. Mixing system consists of an impeller mounted on a submersible motor and supported approximately three feet in height from the tank floor in order for it to launch a jet of water from the bottom of the tank up toward the surface of the water. Floating devices shall not be acceptable. Mixer duty cycle shall be variable with the size and volume of the tank. Mixer control and operation shall be independent of tank drain and fill cycles to ensure constant mixing. Wet-side of mixer shall weigh less than 75 pounds (~34 kg) and dry-side shall weigh less than 50 pounds (~22 kg). Both wet-side and dry-side shall be able to be hoisted, installed, and/or removed by on-site personnel without additional equipment needed, and so that there is no crush hazard or entanglement hazard present, and so that weight of mixer on tank floor does not cause damage to interior coating.
- B. Mixing system active components shall be elevated at a minimum of 18 inches above tank floor to avoid disturbing accumulated tank sediment or entraining particles and causing accelerated wear of moving parts.
- C. Power source for mixer shall be 110VAC grid power to allow unit to continue 24/7 operation where necessary.

## 2.3 CONSTRUCTION

- A. Components – wet-side: shall be NSF/ANSI Standard 61 certified.

Equipment entering tank shall not adhere to, scratch, or otherwise cause damage to, internal tank coating or put undue stress on the materials of the tank construction. Equipment shall fit through a standard hatch of size 18"x18" or larger.

Each submersible mixer shall consist of the following components, regardless of the power source selected:

- 1. Impeller
  - AISI Type 316 Stainless Steel
  - Balanced to within 0.5 gram-inches
  - Passivated per ASTM A380 to minimize corrosion
  - Not more than 8 inches in overall height
  - Not more than 4.5 inches in diameter
  - Not more than 2.2 lbs in weight
  - Shall not create cavitation at any rotational speed up to 2500 RPM

2. Motor
    - AISI Type 316 Stainless Steel body
    - Chlorine/Chloramine resistant rubber seals
    - Fully submersible
    - Low Voltage (10-45V)
    - High Voltage 110 VAC motor not permitted
    - Low power (0.5 HP maximum)
    - Water-filled motor
    - Water-lubricated motor
    - Variable RPM
  3. Mounting Tripod
    - AISI Type 316 Stainless Steel
    - Three-foot long detachable legs, or pedestal mount
    - NSF/ANSI Standard 61 certified EPDM rubber, non-skid, non-scratch feet or insulating pad
    - Attachments secure motor cable away from impeller
    - Overall weight of wet-side unit not to exceed 75 lbs to avoid damaging tank floor
    - Overall height of unit not to exceed 5 ft
- B. Components for dry-side: Each 110VAC control center shall consist of the following components:
1. Enclosure
    - Lockable
    - Over-hanging lip as moisture seal
    - Vandal-resistant, 14 gauge, AISI Stainless Steel 304 construction
    - Overall weight of control center not to exceed 50 lbs
  2. Power supply
    - 48V DC power supply
    - Operating temperature range -40°C to +70°C
    - Automatic Thermal shut-off protection built-in
    - Power Factor meets EN61000-3-2
    - RoHS-compliant design
  3. Motor Controller
    - Conformal-coated PC Board to control motor speed
    - Green and Red LED Indicator lights show motor status
    - Operating temperature range -40°C up to 85°C
    - Manual speed control located on board (potentiometer)

Thermal shut-off protection built-in  
Current overload protection built-in

4. SCADA Control Board

Conformal-coated

Digital Output signal indicating motor running

Digital Output signal indicating fault

Digital Input/output signal allowing remote motor on/off

RS-232 or dry contact connections

Green and Red LED status indicator lights connected on enclosure

- C. All motors and controls which interface with 110VAC grid power shall be connected to a dedicated branch circuit, 15-Amp, 5mA trip level, GFCI-protected 120-volt, 60-Hz, single-phase connection at the control center. It is the CONTRACTOR's responsibility to confirm the availability of suitable electrical service at the site and to include any costs necessary for upgrade in their Bid. The OWNER shall make the project site reasonably available to Bidders, upon request, for examination.

## 2.4 CONTROLS

- A. Each unit shall be equipped with all necessary controls, interwired, to provide the following minimum functions:
1. On/Off switch to control power to mixer.
  2. Automatically-activated motor shut-off if water level drops below motor height in tank.
  3. Any other controls shown on electrical and instrumentation drawings.

## 2.5 GFCI-PROTECTED DISCONNECT SWITCH

- A. Each unit shall have a dedicated 15-Amp, 5mA trip level, GFCI circuit breaker for 120-volt, 60-Hz, single-phase grid power. Connection from circuit breaker to control center shall terminate in a disconnect switch located within 10 feet (3m) of mixer control center. Disconnect switch shall be housed in a lockable, waterproof (NEMA 3r minimum) housing.

## 2.6 ACCEPTABLE MANUFACTURERS

- A. PAX Water Technologies (San Rafael, California) or equivalent Gallons-Per-Minute (GPM) output model from another approved manufacturer (for further information, contact: 1-866-PAX-Mixer, or [www.paxwater.com](http://www.paxwater.com)).



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## **PART 3 – EXECUTION**

### **3.1 INSTALLATION**

- A. The CONTRACTOR shall furnish services of a factory-trained installation contractor or crew having experience with installation procedures and operation and maintenance requirements for the type of equipment installed under these specifications. Mixer must be able to be installed through an 18x18 inch hatch. Mixer must be able to be installed without draining tank or taking tank out of service. Wet-side of mixer shall weigh less than 75 pounds (~34 kg) and dry-side shall weigh less than 50 pounds (~22 kg). Both wet-side and dry-side shall be able to be hoisted, installed, and/or removed by on-site personnel without additional equipment needed, and so that there is no crush hazard or entanglement hazard present, and so that weight of mixer on tank floor does not cause damage to interior coating.
- B. Tank penetration shall be above tank water line, typically through the hatch side-wall.
1. Fitting will prevent moisture intrusion into tank and ideally be horizontally oriented.
  2. Fitting shall be 1 inch diameter fitting to allow cable to pass through.
  3. Strain relief for power cable shall be part of the contractor-supplied fitting for tanks more than 30 feet in depth.
  4. For tanks more than 70 feet in depth, or at OWNER's discretion, a water-tight penetration may be installed under the water-line.
- C. Installation of the in-tank ("wet-side") components may be performed in any of the following ways
1. Installation by a factory-trained and drinking-water-certified potable water tank diver.
  2. Installation by personnel with confined space training while the tank is drained and empty.
- D. Installation of the outside-of-tank ("dry-side") components may be performed by:
1. Third party representatives or CONTRACTOR according to the manual provided.

- E. GFCI-Protected Disconnect switch shall be installed by:
  - 1. Licensed electrical subcontractor per arrangement with CONTRACTOR.
  - 2. Licensed electrician employed by CONTRACTOR.
  
- F. The mixer and control center shall be installed in accordance with approved procedures submitted and as shown, unless otherwise approved in writing from the Factory.

### **3.2 TRAINING**

- A. PAX Water Technologies staff (or their representatives) will instruct designated OWNER personnel in the safe and proper operation of the PAX Water Mixer. This training will reference the operations manual provided with equipment, and show how to check for proper functioning of the equipment.

END OF SECTION

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**SECTION 13210**  
**Elevated Water Tank**

**PART 1 GENERAL**

**1.1 SCOPE**

The CONTRACTOR shall be responsible for all labor, materials and equipment necessary for the design, fabrication, construction, painting, disinfection and testing of an elevated welded steel water storage tank supported by a series of tubular steel supporting columns and cross bracing. This style of tank is commonly referred to as a “multi-column” tank. Design and construction of the Elevated Tank shall conform to all requirements of AWWA D100 Standard for Welded Steel Tanks for Water Storage (current edition), except as modified by the requirements of these contract documents.

**1.2 QUALIFICATION OF MANUFACTURER**

The design and construction of the “multi-column” elevated water storage tank shall only be undertaken by a CONTRACTOR with a minimum of ten (10) years’ experience with elevated tank construction. The CONTRACTOR must be able to demonstrate experience through the design and construction of at least five (5) “multi-column” elevated water tanks.

**1.3 SUBMITTALS**

Prior to contract award, the successful bidder shall submit the following to the ENGINEER:

- 1.3.1. A list of at least five (5) “multi-column” elevated tanks constructed by the CONTRACTOR including the year of completion, tank capacity and contact information for both the Owner and the Engineer for each project.
- 1.3.2. A preliminary drawing of the tank showing major dimensions and plate thickness upon which his bid is based, the high and low water levels and the dimensions of the supporting tower.
- 1.3.3. A foundation design drawing showing preliminary dimensions and approximate quantities of concrete and reinforcing steel.

## **1.4 STANDARD SPECIFICATIONS**

All work on the water storage tank shall fully conform to the requirements of the latest published editions of the following Standard Specifications:

- 1.4.1. AWWA (American Water Works Association) D100 Standard for Welded Steel Tanks for Water Storage.
- 1.4.2. AWWA D102 - Standard for Painting Steel Water Storage Tanks.
- 1.4.3. AWWA C652 - Standard for Disinfection of Water Storage Facilities.
- 1.4.4. AWS (American Welding Society)
- 1.4.5. NSF (National Sanitation Foundation) 61 - Materials in contact with Potable Water.
- 1.4.6. Steel Structures Painting Council Manual - Volume 1 - Good Painting Practice.
- 1.4.7. Steel Structures Painting Council Manual - Volume 2 - Systems and Specifications.
- 1.4.8. ACI 318 - Building Code Requirements for Reinforced Concrete
- 1.4.9. ACI 301 – Standard Specification for Structural Concrete

## **1.5 TANK DETAILS**

The elevated tank shall be all-welded construction of the most economical design. All members of structural steel or of reinforced concrete shall be designed to safely withstand the maximum stresses to which they may be subjected during erection and operation.

- 1.5.1. The minimum operating capacity of the storage tank will be 1,000,000 US gallons.
- 1.5.2. The capacity of the tank, low water level to high water level, shall be contained within a maximum operating head range of 40'-0" +/- 2.5'.
- 1.5.3. The height of the tank, measured from the top of the foundation to the high water level, shall be 161 feet.
- 1.5.4. The top of foundation level shall be 1055'.

## **1.6 PERMITS AND EASEMENTS**

Applicable permits, licenses, airspace authority approval and easements required for the construction of the elevated tower and associated works have been acquired by the OWNER to the maximum extent practicable and are included in the Contract Documents. Any additional easements, permits, licenses, etc. are the responsibility of the CONTRACTOR and shall be obtained at his own expense and at no additional cost to the OWNER. The CONTRACTOR is responsible for re-

energizing and/or relocating any electrical infrastructure as may be required for construction. Any costs for such work shall be included in the BID.

## **1.7 SHOP DRAWINGS**

After contract award and prior to construction, the CONTRACTOR shall provide to the ENGINEER working drawings and design calculations for the elevated steel tank and the foundation. Drawings shall show the size and location of all structural components and reinforcement, the required strength and grade of all materials, and the size and arrangement of principle piping and equipment. The drawings and calculations shall bear the certification of a Professional Engineer licensed in the State of Kentucky. The design coefficients and resultant loads for snow, wind and seismic forces, and the methods of analysis shall be documented. All such drawings shall be submitted to the ENGINEER for approval before fabrication of steel or shipment of equipment and accessories. Six (6) copies of all shop drawings shall be submitted to the ENGINEER.

## **PART 2 DESIGN**

### **2.1 GENERAL**

The structural design of the elevated storage tank shall conform to the following design standards (latest edition) except as modified or clarified as follows:

- 2.1.1 Foundations – AWWA D100 and ACI 318 – Building Code Requirements for reinforced concrete.
- 2.1.2 Steel Tank – AWWA D100
- 2.1.3 Steel Tank Painting – AWWA D102

### **2.2 LOADS**

- 2.2.1 Seismic Load  
Seismic loads shall be determined by the CONTRACTOR in accordance with AWWA D100
- 2.2.2 Wind Load  
Wind loading shall be determined by the CONTRACTOR in accordance with AWWA D100. Basic wind speed used in the wind pressure formula shall be determined using the actual location of the Project and applicable sections of AWWA D100

### 2.2.3 Snow Load

Snow load shall be determined by the CONTRACTOR in accordance with AWWA D100.

## 2.3 FOUNDATION

A geotechnical investigation has been carried out at the site and a copy of the report is included with the Contract Documents. Allowable bearing capacities are defined in this report. The CONTRACTOR shall retain the services of the Geotechnical consultant who authored the report to verify the adequacy of the bearing stratum after the CONTRACTOR has carried out the excavation and before any concrete or reinforcement is placed. The concrete foundation shall be designed by the CONTRACTOR based upon the recommendations in the geotechnical report.

## 2.4 STEEL TANK

### 2.4.1 General

The materials, design, fabrication, erection, welding, testing and inspection of the steel tank shall be in accordance with the applicable sections of AWWA D100 except as modified in this document.

### 2.4.2 Minimum Plate Thickness

The minimum thickness for any part of the structure shall be 3/16 inch for parts not in contact with water and 1/4 inch for parts in contact with water. All portions of the tank including the roof shall be of watertight construction.

## PART 3 CONSTRUCTION

### 3.1 CONCRETE FOUNDATION

The foundation shall be designed and constructed by the CONTRACTOR to safely and permanently support the structure. The basis of the foundation construction shall be consistent with the soils investigation data provided by the OWNER and included in the contract documents. The concrete foundation shall be constructed in accordance with ACI 301. Minimum concrete compressive strength shall be 4000 PSI. Care shall be taken to insure smooth, rubbed finish on all portions of the foundation projecting above the ground surface.

Appropriate changes to the construction schedule and price will be negotiated if soils conditions are encountered with differ significantly from those described in the geotechnical report and verified by the geotechnical consultant.

## **3.2 STEEL TANK CONSTRUCTION**

### **3.2.1 General**

The erection of the steel tank shall comply with the requirements of AWWA D100 except as modified by these documents.

### **3.2.2 Welding**

All shop and field welding shall conform to AWS and AWWA D100. Before any welding is performed, the CONTRACTOR shall submit the welders or welding operator's certifications to the ENGINEER for review. All welders shall be qualified in accordance with ASME Section IX and/or ANSI/AWS B2.1.

### **3.2.3 Fabrication**

All fabrication and shop assembly shall conform to the requirements of AWWA D100. The ENGINEER shall be notified in writing a minimum of five (5) working days prior to commencement of shop fabrication. All phases of shop fabrication, and particularly surface preparation and shop priming, shall be made available to the ENGINEER for inspection and approval. The ENGINEER will provide a NACE certified coatings inspector for the Project as his representative. See the surface preparation and coating section of the contract documents for more information.

### **3.2.4 Erection**

Plates subjected to stress by the weight or pressure of the contained liquid shall be assembled and welded in such a manner that the proper curvature of the plates in both directions is maintained. Plates shall be assembled and welded together by a procedure that will result in a minimum of distortion from weld shrinkage.

### **3.2.5 Testing of Welds**

Testing for both shop and field welds shall be in accordance with AWWA D100. All testing and inspection shall be performed prior to interior and exterior field painting. The testing shall be performed by an independent testing agency with all costs included in the CONTRACTOR's bid and paid by the CONTRACTOR. A written report detailing the test results and any corrective measures taken by the CONTRACTOR shall be submitted to the ENGINEER and his representative by the independent testing agency for approval prior to any painting.

### 3.2.6 Roof Lap Joints

All interior lap joints and seams above the water line shall be sealed by means of continuous seal welding. This shall include penetrations of roof accessories.

### 3.2.7 Painting and Disinfection

Surface preparation and coating of all steel surfaces shall be in accordance with Section 13220 "Surface Preparation & Coating" and other applicable sections of the Contract Documents.

## **PART 4 ACCESSORIES**

### **4.1 GENERAL**

The following accessories shall be provided in accordance with the Contract Documents. All items shall be in full conformity with the current applicable OSHA safety regulations and the operating requirements of the structure.

### **4.2 LADDERS**

Access ladders shall be provided at the following locations:

4.2.1 The tower ladder shall extend up one column from near the base connecting with the balcony. The first rung shall be located approximately 8 feet above top of foundation. The tower ladder shall be attached to a column opposite the orientation of the sign to be painted on the tank.

4.2.2 An outside tank ladder from the balcony to the roof hatch.

4.2.3 An inside tank ladder from the roof hatch to the inside bottom of the tank. Ladder side rails shall be a minimum 3/8 inch by 2 inches with a 16 inch clear spacing. Rungs shall be not less than 3/4 inch, round or square, spaced at 12 inch centers. The surface of the rungs shall be knurled, dimpled or otherwise treated to minimize slipping. Ladders shall be secured to adjacent structures by brackets located at intervals not exceeding 10 feet. Brackets shall be of sufficient length to provide a minimum distance of 7 inches from the center of the rung to the nearest permanent object behind the ladder.

4.2.4 An inside riser ladder from the base of the riser to the bottom of the tank.



4.2.5 Ladder side rails shall be a minimum 3/8 inch by 2 inches with a 16 inch clear spacing. Rungs shall be not less than 3/4 inch, round or square, spaced at 12 inch centers. The surface of the rungs shall be knurled, dimpled or otherwise treated to minimize slipping. Ladders shall be secured to adjacent structures by brackets located at intervals not exceeding 10 feet. Brackets shall be sufficient length to provide a minimum distance of 7 inches from the center of the rung to the nearest permanent object behind the ladder.

### **4.3 FALL PROTECTION**

All ladders shall be equipped with a fall arrest system meeting OSHA regulations. The tower ladder shall be equipped with a safety cage. The system shall be supplied to the OWNER by the CONTRACTOR complete with safety harnesses, locking mechanisms, and accessories for two persons. The CONTRACTOR shall notify the ENGINEER in writing upon delivery of the fall arrest system to the OWNER.

### **4.4 BALCONY**

The tank shall be equipped with a balcony not less than 36" wide with a handrail not less than 42" high. The floor shall be a minimum of 1/4" steel plate perforated for drainage.

### **4.5 OPENINGS**

#### **4.5.1 Roof Hatches**

Provide two access hatches on the roof of the tank. One hatch shall be 30 inch diameter and allow access from the roof to the interior of the tank. The hatch will be hinged and equipped with a hasp for locking. The hatch cover shall have a 2 inch downward edge. The second hatch will be 24 inch diameter and flanged with a removable cover so constructed that an exhaust fan may be connected for ventilation during painting operations. The openings shall have a minimum 4 inch curb.

#### **4.5.2 Tank Vent**

The tank vent should be centrally located on the tank roof above the maximum weir crest elevation. The tank vent shall have an intake and relief capacity sufficiently large that excessive pressure or vacuum will not develop during maximum flow rate. The vent shall be designed, constructed and screened so as to prevent the ingress of wind driven debris, insects, birds and animals. The vent shall be designed to operate when frosted over or otherwise clogged. The screens or relief material shall

not be damaged by the occurrence and shall return automatically to operating position after the blockage is cleared.

#### 4.5.3 Riser Manhole

A minimum 24 x 24 inch access manhole shall be provided approximately 3 feet above the base of the wet riser. The manhole shall be complete with Davit Arm or self-supported hinge device

### 4.6 RISER

The diameter of the wet riser shall be not less than 8 feet.

### 4.7 PIPING

#### 4.7.1 Inlet/Outlet Piping

The completed tank shall have separate 12" inlet and outlet pipes as shown on the detail sheets. The inlet pipe shall extend the entire length of the riser pipe and a minimum of 20 feet into the tank bowl. The inlet pipe shall be braced a maximum of every 10 feet. A deflector plate, as shown on the detail sheets, shall be installed at the top of the inlet pipe. The inlet pipe shall be supported by cables secured from the ceiling and by steel supports from the tank floor.

#### 4.7.2 Overflow

The 12" inch steel overflow pipe shall have a minimum wall thickness of 1/4" and shall utilize welded joints. A suitable weir shall be provided inside the tank with the crest located at High Water Level. The overflow shall be routed from the weir to closely match the roof contour and extend down the ladder column discharge onto a concrete splash pad with minimum dimensions of 6' x 10'. The point of discharge shall be equipped with a stainless steel screen. The overflow shall be oriented away from the sign to be painted on the tank and shall extend a minimum of ten (10) feet beyond any foundation structure, in an effort to avoid erosion near the foundation. The overflow pipe shall include a concrete support located near the splash pad.

### 4.8 IDENTIFICATION PLATE

A tank identification plate shall be mounted on the tank riser pipe above the access manhole. The identification plate shall be corrosion resistant and contain the following information.

- 4.8.1 Project OWNER
- 4.8.2 Tank Contractor
- 4.8.3 Contractor's project or file number
- 4.8.4 Tank capacity
- 4.8.5 Height to High Water Level
- 4.8.6 Date erected
- 4.8.7 Project ENGINEER

#### **4.9 ROOF CORRAL/HANDRAIL**

1. CONTRACTOR shall design and install a corral/handrail to be installed at or near the top center of the tank roof for antenna mounting and personnel safety purposes.
2. The CONTRACTOR shall submit design drawings and details, signed and sealed by a licensed engineer in the State of Kentucky, to the ENGINEER for review in accordance with applicable sections of the Contract Documents.
3. The design, materials, fabrication and construction shall be in accordance with the applicable requirements of AWWA Standard D100 and OSHA requirements. The handrail shall be designed and detailed to encircle the roof appurtenances and conform to tank roof geometry.
4. The circular handrail shall be continuous and shall be welded steel construction. An opening, complete with safety chains, shall be provided at the roof ladder location. The diameter of the corral/handrail shall be approximately 20 feet.
5. The handrail system shall be 42" high, have 3" x ¼" angle posts, 2-1/2" x ¼" top rail, 3" x 3/8" mid rail, and a 4" x ¼" toe bar. Stated dimensions are minimum.
6. The handrail system shall have supplementary 2" diameter pipe posts to facilitate antenna mounting.
7. All connections shall be designed to eliminate water entrapment and have continuous welds.
8. Roof Corral/Handrail shall receive the same coatings as specified for the tank exterior.
9. OWNER shall be responsible for mounting of new antennae and appurtenances to the new Corral/Handrail.

#### **5.0 TESTING OF TANK**

When the entire tank structure has been completed, it shall be tested by being filled with water provided by the OWNER. Any and all leaks that may appear shall be stopped and repaired by the CONTRACTOR. Leaks shall be repaired by welding only. No repair work shall be completed on any joints unless water in the tank is at least two (2) feet below the point being repaired. Upon completion of any repair work, the tank shall be refilled with

water provided by the CONTRACTOR and re-tested. If the tank has already been sterilized prior to repairs and refilling, the CONTRACTOR shall re-sterilize the tank at no cost to the OWNER.

## **6.0 CLEANUP**

Upon completion of construction, the CONTRACTOR shall remove all equipment and materials from the site and shall dispose of all rubbish and debris around the site. The CONTRACTOR is responsible for leaving the premises in as good or better condition than it was prior to the commencement of construction activities.

## **7.0 WARRANTY**

The tank CONTRACTOR shall warranty its work for a period of one (1) year from the substantial completion date defined in the contract documents and acknowledged in writing by the ENGINEER to the extent that it will repair any defects caused by faulty design, workmanship or material furnished under the specifications. If CONTRACTOR is not advised of any defects within 30 days *after* the end of warranty period, warranty shall be considered fulfilled and complete. Defects caused by damaging service conditions such as electrolytic, chemical, abrasive or other damaging service conditions are not covered by this warranty. The CONTRACTOR's warranty shall also cover coatings and the application thereof.

END OF SECTION

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**SECTION 13220**

**WATER STORAGE TANK SURFACE PREPARATION & COATING**

**PART 1 - GENERAL**

1.01 SCOPE

- A. This specification covers repair, preparation of surfaces, performance and completion of painting of all surfaces specified on the following structures:

All Interior and Exterior Surfaces

- B. The CONTRACTOR shall be responsible for all costs associated with painting operations as outlined in the Contract Documents.

1.02 WORK INCLUDED

- A. Preparation of surfaces which are to receive finishes  
B. Finish surfaces  
C. Testing and cleaning

1.03 RELATED WORK AND APPLICABLE REQUIREMENTS SPECIFIED ELSEWHERE

- A. BIDDING REQUIREMENTS, CONTRACT FORM AND CONDITIONS OF THE CONTRACT AND GENERAL REQUIREMENTS shall apply to all work included in this section.

1.04 DOCUMENTS AND STANDARDS

- A. Coating manufacturer's printed instructions
- B. American Society of Testing Materials (latest editions)
1. ASTM B117 Salt Spray (Fog)
  2. ASTM D149 Dielectric Strength
  3. ASTM D4060 Abrasion
  4. ASTM D4541 Adhesion
  5. ASTM D4585 Humidity
  6. ASTM G53 QUV Exposure
  7. ASTM D 4141 Exterior Exposure (EMMAQUA)
  8. AAMA 2604 5 Years South Florida Exposure

- C. American National Standards Institute/National Sanitation Foundation (latest editions)
  - 1. ANSI/NSF Standard 61 Listed Drinking Water System Components - Health Effects
- D. American Water Works Association (latest editions)
  - 1. AWWA Standard C652 Disinfection
  - 2. AWWA Standard D100 Welded Steel Tanks for Water Storage
  - 3. AWWA Standard D102 Painting Steel Water Storage Tanks
- E. Code of Federal Regulations
  - 1. 29 CFR 1910 Occupational Safety and Health Standards (General Industry Standards)
  - 2. 29 CFR 1910.134 Respiratory Protection
  - 3. 29 CFR 1910.1020 Access to Employee Exposure and Medical Records
  - 4. 29 CFR 1926 Safety and Health Regulations for Construction (Construction Industry Standards)
  - 5. 40 CFR 50 National Primary and Secondary Ambient Air Quality Standards
  - 6. 40 CFR 268 Land Disposal Restrictions
  - 7. All other Applicable State and Federal Regulations
- F. National Institute for Occupational Health and Safety
- G. Occupational Safety and Health Administration
- H. Steel Structures Painting Council (SSPC)
  - 1. SSPC-SP 1 Solvent Cleaning
  - 2. SSPC-SP 2 Hand Tool Cleaning
  - 3. SSPC-SP 3 Power Tool Cleaning
  - 4. SSPC-SP 6 Commercial Blast Cleaning
  - 5. SSPC-SP 10 Near White Blast Cleaning

#### 1.05 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Provide products from a company specializing in the manufacture of high performance coatings with a minimum of 10 years experience.

2. Applicator shall be trained in application techniques and procedures of coating materials and shall demonstrate a minimum of 5 years successful experience in such application.
    - a. Maintain, throughout duration of application, a crew of painters who are fully qualified to satisfy specified qualifications.
  3. Single Source Responsibility:
    - a. Materials shall be products of a single manufacturer or items standard with manufacturer of specified coating materials.
    - b. Provide secondary materials which are produced or are specifically recommended by coating system manufacturer to ensure compatibility of system.
- B. Regulatory Requirements:
1. Conform to applicable codes and ordinances for flame, fuel, smoke, and volatile organic compound (VOC) ratings requirements for finishes at time of application.
- C. Pre-Installation Meeting:
1. Schedule a conference and inspection to be held on-site before field application of coating systems begins.
  2. Conference shall be attended by CONTRACTOR, OWNER's representative, ENGINEER or his representative, coating applicators, and a representative of coating material manufacturer.
  3. Topics to be discussed at meeting shall include:
    - a. A review of Contract Documents and accepted shop drawings shall be made and deviations or differences shall be resolved.
    - b. Review items such as environmental conditions, surface conditions, surface preparation, application procedures, and protection following application. A surface mock-up of the surface preparation requirements for the project, both interior and exterior, shall be prepared by the CONTRACTOR. All parties shall agree to the degree of cleanliness and the mock-up shall be preserved for the duration of the project.
    - c. Establish which areas on-site will be available for use as storage areas and working area
  4. Pre-installation conference and inspection shall serve to clarify Contract Documents, application requirements and what work should be completed before coating application can begin.

5. CONTRACTOR shall prepare and submit, to parties in attendance, a written report of pre-installation conference. Report shall be submitted within three (3) days following meeting.

#### 1.06 SURFACE PREPARATION

- A. The ENGINEER will provide a project representative that is specifically tasked with monitoring work related to this Contract. The representative will be a NACE certified corrosion control technician, under subcontract to the ENGINEER. It is the CONTRACTOR's responsibility to coordinate the Work with the ENGINEER's representative and schedule the Work with a reasonable advanced notice to the ENGINEER's representative to allow the Work to be examined for compliance. Failure to do so will be deemed solely the fault of the CONTRACTOR and the cost for any and all remedial work required to allow said examination or correction of faulty work will be the sole responsibility of the CONTRACTOR.

The ENGINEER's representative will be:

Mr. Mike Topp

Horizon Inspection

PO Box 338

Campbellsburg, KY 40011

(502)727-2828

[horizoninspection@yahoo.com](mailto:horizoninspection@yahoo.com)

Any change in personnel will be provided to the CONTRACTOR prior to construction. Reference to ENGINEER herein is understood to also mean the ENGINEER's representative.

- B. CONTRACTOR shall conduct self-inspections prior to requesting inspections by the ENGINEER.
- C. The ENGINEER, or his representative, will examine the tank during cleaning to assure surfaces are properly prepared. Any additional cleaning required shall be the sole responsibility of the CONTRACTOR.
- D. CONTRACTOR shall question ENGINEER, or his representative, if he is in doubt whether the surface to be painted is suitably prepared for coating application.

#### 1.07 APPLICATION (GENERAL)

- A. CONTRACTOR shall have a complete set of catalog cuts and application instructions for all coating and sealant materials on site during the Work.



- B. Remedial measures due to lack of compliance with the above, or non-performing coatings for any reasons shall be the sole responsibility of the CONTRACTOR.
- C. Workmanship shall be of first rate quality, as defined by the ENGINEER. Finish painting shall show no drips, runs, sags, holidays or other defects. The finish coats shall be free from noticeable laps or brush marks. Paint during application shall be continuously stirred. Coatings shall be thoroughly worked into all joints and corners, and well brushed out over all surfaces. Should any coat or paint be judged unsatisfactory by the ENGINEER, the CONTRACTOR shall remove the coat(s) as necessary, and to the satisfaction of the ENGINEER, and repaint at no additional cost to the OWNER.
- D. It is to be noted by the CONTRACTOR that coatings application may need to occur in cold weather months. In such instances, additives may be included in the coatings to accommodate field conditions as required, and/or alternative application methods may be employed, per manufacturer's recommendations. Inasmuch as the CONTRACTOR is in complete and sole control of the scheduling and coordination of the Work, no additional compensation shall be forthcoming to the CONTRACTOR in such instances.

#### 1.08 QUALITY CONTROL

- A. Sampling of Products
  - 1. The ENGINEER may obtain test samples from materials stored at the job site or at the source of supply.
  - 2. The ENGINEER shall select any desired samples of coating materials at random from sealed and unopened containers.
- B. The ENGINEER may request a written certification from the coating manufacturer to verify purchase of the material.

### **PART 2 - MATERIALS**

#### 2.01 QUALITY OF COATINGS

The paints and paint products mentioned in the following specifications are set up as standards of quality. The usual "or equal" clause shall apply. No request for substitution will be considered which reduces the performance attributes or which offers a change from the generic type of coating specified. Request for substitution shall contain the following:

- A. FULL NAME OF EACH PRODUCT
- B. DESCRIPTIVE LITERATURE
- C. DIRECTIONS FOR USE
- D. GENERIC TYPE
- E. NON VOLATILE CONTENT BY VOLUME
- F. PERFORMANCE DATA LISTED IN SECTION 8.

Bidders desiring to use paints other than those specified shall submit their proposal based on the specified materials. Submittals shall include test data as outlined in Section 8 of these specifications. Test results shall be logged in the table provided and shall be accompanied by certified laboratory test reports. In no case will the request be considered unless received, in writing with all required data included, ten days prior to the bid opening date.

## 2.02 CERTIFICATIONS

Protective coatings for interior wet application shall be listed by NSF International as approved for potable water contact in accordance with ANSI/NSF Std. 61.

## 2.03 SHIPPING, STORAGE AND HANDLING

- A. All paints shall be properly prepared by the manufacturer and delivered to the site for field painting in the original unbroken containers with manufacturer's label plainly printed thereon. Type of material to be applied at each location shall be submitted to the ENGINEER with the manufacturer's written recommendation of the type paint for each item to be painted.
- B. The CONTRACTOR shall store all coatings in an enclosed structure to protect them from weather and excessive heat or cold. Flammable coatings must be stored to conform to City, County, State and Federal safety codes for flammable coatings or paint materials. At all times coatings shall be protected from freezing.
- C. Maintain jobsite copy of Material Safety Data Sheets (MSDS) for all coating materials, thinners, solvents and sealant used on the Project.
- D. Handle coating materials and solvents as specified per AWWA D102 and Federal OSHA.
- E. Comply with coating manufacturer's storage recommendations.
- F. All coating material cans, opened or unopened, shall remain on the job site for inspection by ENGINEER. Do not discard until directed to do so by ENGINEER's representative.

- G. Abrasives shall be delivered to jobsite in sealed container(s) and stored in a dry location.
- H. Only accepted materials may be stored on site.
- I. Store all material in a suitable location and in accordance with written instructions of the manufacturer and requirements of insurance underwriters.

#### 2.04 SUBMITTALS

- A. General
  - 1. Submittals shall be in conformance with Section 01340 – Shop Drawings, Product Data and Samples, unless otherwise specified herein.
- B. Submittals shall include, at a minimum:
  - 1. Catalog cuts, application instructions, and Material Safety Data Sheets for exterior surfaces coating system materials.
  - 2. Catalog cuts, application instructions, and Material Safety Data Sheets for interior (wet and dry areas) surfaces coating system materials.
  - 3. Color charts for exterior finish colors and sign colors selection.
  - 4. Catalog cuts, application instructions, and Material Safety Data Sheets for interior sealant.
  - 5. Containment System:
    - a. Description and diagram of containment system and details.
    - b. System list for lifting equipment, screens, containment structure, ground anchors, and mounting brackets on tank.
    - c. Wind load calculations to determine maximum wind speed for containment system operation.
    - d. Evaluation of calculated stresses at containment system support connections on tank and declaration the tank will support the additional loads.

- e. Containment system details, wind load calculations, and structural design and evaluation must be signed and sealed by a structural engineer licensed in the State of Kentucky.
- 6. Drawings for installation of mixing system, ladders and safety devices signed and sealed by a structural engineer licensed in the State of Kentucky.
- 7. CONTRACTOR's written safety program.

### **PART 3 - APPLICATION**

#### **3.01 GENERAL**

- A. Prepare surface and touch-up welds, burned and abraded areas on primed steel with specified primer before applying field coats. All surface preparation shall be reviewed and approved by the ENGINEER's representative prior to application of any coatings.
- B. The painter shall mix, thin and apply each coating at the rate and manner specified by the manufacturer's printed instructions. Deficiencies in film thickness shall be corrected by the application of an additional coat(s) of paint.
- C. Each successive coat shall contrast significantly in color from the previous coat.
- D. No successive coatings shall be applied until the previous coat has been reviewed and approved by the ENGINEER.
- E. All coatings shall be applied in strict accordance with the applicable manufacturer's current printed product data sheet(s) and container labels. Coatings shall not be applied above or below the minimum and/or maximum surface temperatures as stated on the product data sheet(s) and shall not be applied to wet or damp surfaces, in rain, snow, fog or mist. Surface temperature must be at least 5°F above the dew point.
- F. Painting shall be completed well in advance of the probable time of day when condensation will occur and/or the surface temperature is expected to drop below the minimum listed on the applicable product data sheet(s).
- G. Finish coats shall be uniform in color and sheen without streaks, laps, runs, sags or missed areas.
- H. The manufacturer's recommended curing time shall elapse before the next coat is applied. Adequate ventilation shall be provided for proper drying of paints on

interior tank surfaces. A minimum of 7 days following the application of the final coat on the interior surfaces shall be allowed before the tank is flushed, disinfected or filled with water.

- I. Clean-Up: All cloths and waste that might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each day. Upon completion of the work, all staging, scaffolding, and containers shall be removed from the site and/or destroyed in an approved and legal manner. Paint spots, oil, or stains upon adjacent surfaces and floors shall be completely removed, and the entire job left clean and acceptable to the ENGINEER.
- J. Under no circumstances shall prepared surfaces be allowed to rust prior to coatings application. Do not leave exterior prepared surfaces uncoated for more than eight (8) hours without ENGINEER's approval. In the event rusting of any amount occurs, the CONTRACTOR shall re-prepare the rusted area to the satisfaction of the ENGINEER and at no cost to the OWNER.
- K. All necessary welding shall be completed by the CONTRACTOR prior to coating the interior or exterior surfaces of welded areas.
- L. Should conflicts arise between referenced standards and procedures and manufacturer's requirements, the manufacturer's requirements shall take precedence.
- M. Prior to use, all coatings and components shall be thoroughly mixed in accordance with manufacturer's instructions. Multiple component coatings shall be prepared using all of the contents of the container for each component as packaged by the manufacturer. Multiple component coatings that have been mixed shall not be used beyond their pot life. Only components specified and furnished by the selected manufacturer shall be mixed.
- N. Under no circumstances shall coatings be applied onto wet surfaces.

### 3.02 EXISTING UTILITIES STRUCTURES AND PROPERTIES

- A. It shall be the sole responsibility of the CONTRACTOR to locate, identify and avoid damages to any all (private or public; on-site or off; above ground or below) existing utilities, structures and appurtenances that may be potentially impacted by the Work. The CONTRACTOR shall repair or pay for all damages caused by his operations or personnel (overspray or any other reason) thereto and shall settle in full all damage suits which may arise as a result of his operations, at no cost to the OWNER or ENGINEER. The CONTRACTOR shall be solely responsible for cleaning and correcting the condition of any property

damaged and restoring it to as good as or better than pre-construction conditions.

- B. It is intended that the videotaping specified elsewhere in the Contract Documents will document all existing conditions prior to mobilization by the CONTRACTOR. It is the CONTRACTOR's responsibility to determine all areas to be videotaped.

### 3.03 VENTILATION

It is essential that the solvent vapors released during and after application of coatings be removed from the tank. During coating application the capacity of ventilating fans shall be at least 300 cfm per gallon of coating applied per hour. Continuous forced ventilation at a rate of at least one complete air change per 4 hours shall be provided for at least 7 days after coating application is completed. Air shall be exhausted from the lowest portions of the tank with the top openings kept open and clear. A minimum of seven days (manufacturers printed instructions shall be followed for cure times at various temperatures) following application of the final coat on the interior shall be allowed before the tank is sterilized or filled with water.

### 3.04 CONTAINMENT SYSTEM:

- A. Containment system shall be installed on tank prior to, and remain in satisfactory operating condition during, abrasive blasting.
- B. Containment System Components
  1. Containment System per SSPC-Guide 6, Classification 3A.
  2. Impervious ground cover consisting of two layers of polyethylene sheeting and plywood.
  3. Lead emissions from the containment system shall be monitored by the CONTRACTOR in accordance with SSPC-Guide 6, Method A: Visible Emissions and Method E: Soil Analysis for Toxic Metals (Lead). Written documentation of emissions shall be provided to the OWNER and ENGINEER upon request, and bi-monthly at a minimum.
  4. The containment system mounting lugs shall remain on the tank.

**PART 4 - PAINTERS LOG AND TESTING EQUIPMENT**

## 4.01 DAILY LOG

The CONTRACTOR shall keep a daily log in which he shall record the following information:

- A. Air Temperature: Air temperature readings shall be taken by the CONTRACTOR at intervals throughout the day's work. Readings shall be taken at the start of the mornings work, mid day and afternoon. Should environmental conditions change, additional reading shall be taken to assure that coatings are being applied under the conditions as outlined by the coatings manufacturer.
- B. Surface Temperature: Surface temperatures shall be taken by the CONTRACTOR in areas where work is being performed. Surface temperature shall be that as specified by the coatings manufacturer.
- C. Material Temperature: Material temperature reading shall be taken by the CONTRACTOR prior to the application of the paint.
- D. Relative Humidity: Relative humidity readings shall be taken by the CONTRACTOR at intervals throughout the day's work. Readings shall be taken at the start of the mornings work, mid day and afternoon. Should environmental conditions change, additional reading shall be taken to assure that coatings are being applied under the conditions as outlined by the coatings manufacturer.
- E. Dew Point: Dew point readings shall be taken by the CONTRACTOR at intervals throughout the day's work. Readings shall be taken at the start of the mornings work, mid day and afternoon. Should environmental conditions change, additional reading shall be taken to assure that coatings are being applied under the conditions as outlined by the coatings manufacturer.
- F. Blast Profile: Following blasting operations, the CONTRACTOR shall take and record the depth of the blast profile. Blast profile measurements shall be taken using Testex X Course Replica Tape. Replica Tape shall be included in the daily log.
- G. Detail or Work Performed During the Day: Area where work was performed and the extent of the work performed shall be included in the CONTRACTOR's daily log.

#### 4.02 TESTING EQUIPMENT

In addition to the equipment required to take measurements which will be included in the daily log, The CONTRACTOR shall have on the project site the following testing equipment. Equipment shall be in calibration and proper working order.

- A. Dry Film Thickness Measurements Gauge: Dry film thickness reading shall be taken with a properly calibrated (per the manufacturer's instructions) Type 1 (magnetic) or Type 2 (electromagnetic) instrument. Dry film thickness reading will be taken and recorded in a frequency and manner as dictated by the ENGINEER.
- B. Low Voltage Holiday Detection Equipment: Interior surfaces, following a minimum of 72 hours cure, shall be holiday detected in accordance with ASTM G 62 low voltage holiday detection. Holiday detector shall be a Tinker & Rasor Model M-1 or equal. Areas found to have holidays shall be marked and repaired in accordance with the paint manufacturer's instructions. The ENGINEER shall be notified of time of testing so that he might be present to witness testing, as well as the scheduled time of any repair work and/or re-testing.

### **PART 5 - SURFACE PREPARATION & PAINTING:**

#### 5.01 EXTERIOR SURFACE PREPARATION

Prior to surface preparation, all surfaces shall be cleaned of all oil and grease in accordance with SSPC-SP 1 Solvent Cleaning. All exterior surfaces shall be abrasive blasted to remove all dust, rust and scale, as well as all other foreign matter and shall result in a surface preparation equal to that of SSPC-SP 6 Commercial Blast Cleaned Surface. Surface profile shall be angular and a minimum 2.0 mils.

#### 5.02 INTERIOR (WET) SURFACE PREPARATION

Prior to surface preparation, all surfaces shall be cleaned of all oil and grease in accordance with SSPC-SP 1 Solvent Cleaning. All interior surfaces shall be abrasive blasted to remove all dust, rust and scale, as well as all other foreign matter and shall result in a surface preparation equal to that of SSPC-SP 10 Near White Blast Cleaned Surface. Surface profile shall be angular and a minimum 2.0 mils.

#### 5.03 COATING SYSTEM

Following surface preparation, all interior and exterior surfaces shall be coated as hereinafter specified. The primer shall be applied in accordance with the recommendations of the manufacturer and not more than eight hours after surface preparation.



## A. INTERIOR SURFACES

1. Shop Primer: All interior surfaces shall receive one full prime coat of *Tnemec N140-1255 Potapox Plus* applied at a rate to achieve 3.0 – 5.0 mils DFT.

Alternate Shop Primer: Rustoleum W9200 Potable Water Epoxy applied at 5.0 – 8.0 mils DFT

2. Seam Treatment: Following primer coat, all weld seams, joints, ladders, sharp edges, corners and any other difficult to coat areas shall receive one coat of *Tnemec Series N140-1255 Pota-Pox Plus* applied, **by brush**, at a rate to achieve 2.0 – 4.0 mils DFT.

Alternate Seam Treatment: Rustoleum W9293 applied at 3.0 – 5.0 mils DFT

3. Intermediate: All interior surfaces shall receive an intermediate coat of contrasting color of *Tnemec Series 20 Pota-Pox* applied at a rate to achieve 3.0- 5.0 mils DFT.

Alternate Intermediate: Rustoleum W9293 (contrasting color) applied at 5.0 – 8.0 mils DFT.

4. Finish: After proper cure of the intermediate coat, all interior surfaces shall receive one full finish coat of *Tnemec Series 20 Pota-Pox Plus* applied at a rate to achieve 4.0 – 6.0 mils DFT.

Alternate Finish: Rustoleum W9293 – Tank White, applied at 5.0 – 8.0 mils DFT.

5. THE INTERIOR WET COATING SYSTEMS SHALL HAVE A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 10.0 MILS DFT.

The alternate interior wet coating system shall have a total dry film thickness of not less than 15.0 mils DFT

## B. EXTERIOR SURFACES

1. Shop Primer: All exterior surfaces that have been cleaned in accordance with the paragraph above shall receive one coat of *Tnemec Series N140-1255 Pota-Pox Plus* applied at a rate to achieve 3.0 – 5.0 mils DFT.

Alternate Shop Primer: Rustoleum W9200 Potable Water Epoxy applied at 5.0 – 8.0 mils DFT.

2. Seam Treatment: Following primer coat, all weld seams, joints, ladders, sharp edges, corners and any other difficult to coat areas shall receive one coat of *Tnemec Series N140-1255 Pota-Pox Plus* applied, **by brush**, at a rate to achieve 2.0 – 4.0 mils DFT.

Alternate Seam Treatment: Rustoleum 9370 Epoxy Primer applied at 3.0 – 5.0 mils DFT.

3. Intermediate: After the prime coat has been properly installed, all exterior surfaces shall receive one intermediate coat of *Tnemec Series 66 Epoxoline* applied at a rate to achieve 2.0 – 3.0 mils DFT.

Alternate Intermediate: Rustoleum 9370 Epoxy Primer applied at 3.0 – 5.0 mils DFT.

4. Finish: Following the intermediate coat, all exterior surfaces shall receive one full finish coat of *Tnemec Series 740UVX* applied at a rate to achieve 2.0 – 3.0 mils DFT.

Alternate Finish: Rustoleum 9800 2X UV Urethane Mastic applied at 3.0 – 5.0 mils DFT.

Finish Coat shall be equivalent in color to Tnemec 15 BL Tank White.

THE EXTERIOR COATING SYSTEM SHALL HAVE A MINIMUM DRY FILM THICKNESS OF 6.5 DRY MILS.

The alternate exterior coating system shall have a minimum dry film thickness of 11.0 mils.

5. Lettering: Lettering and / or logos shall be located in accordance with the drawings and shall be applied using *Tnemec Series 700 HydroFlon* applied at a rate to achieve 2.0 – 3.0 dry mils per coat.

Alternate Lettering: Rustoleum 9800 2X UV Urethane Mastic.

Tank lettering shall be Black.

Lettering shall be of sufficient height to be easily read from US 27 and shall read "Jessamine County Water District No. 1" in two lines of text. Sign/logo orientation and sizing shall be submitted in a rendering to the

ENGINEER and OWNER for approval. It is desired for the logo to be clearly identifiable from US 27 and be of maximum size reasonably accommodated by the curvature of the tank bowl. The lettering coatings shall be applied within the recoat window as indicated by the coatings manufacturer.

## **PART 6 - ACCEPTANCE OF WORK**

- 6.01 Damaged coatings, pinholes, and holidays shall have edges feathered and repaired in accordance with the recommendations of the manufacturer, as approved by the ENGINEER.
- 6.02 All finish coats, including touch up and damage-repair coats shall be applied in a manner which will present a uniform texture and color-match appearance.
- 6.03 If the item has an improper finish, color, or insufficient film thickness, the surface shall be cleaned and topcoated with the specified material to obtain the specified color and coverage. Specific surface preparation information shall be secured from the coatings manufacturer and approved by the ENGINEER.
- 6.04 All visible areas of chipped, peeled, or abraded paint shall be hand or power-sanded, feathering the edges. The areas shall then be primed and finish coated in accordance with the specifications.
- 6.05 Work shall be free of runs, bridges, shiners, laps, or other imperfections. Evidence of these conditions shall be cause for rejection.
- 6.06 Any defects in the coating system shall be repaired by the CONTRACTOR per written recommendations of the coating manufacturer and reviewed and approved by the ENGINEER.
- 6.07 INSPECTION
- A. The ENGINEER will have a representative on site for the duration of production surface preparation and coatings application. The ENGINEER's representative will not be on the site on a continuous basis. It is the CONTRACTOR's responsibility to coordinate the Work with the ENGINEER's representative in advance to allow for observation of all critical phases of the Work and prior to the application of each coat.
- B. CONTRACTOR shall assist ENGINEER's representative in using CONTRACTOR's rigging to access any surface of the tank for inspection to insure the completeness or quality of the Work.

- C. Rigging shall not be removed from a work area until final inspections of those surfaces have been made and the work accepted.
- D. If CONTRACTOR schedules an inspection that he is not prepared for, or removes rigging before required inspection is made, cost of re-rigging, cost of additional inspections, and cost of related remedial work shall be borne by CONTRACTOR.
- E. Costs incurred directly by OWNER due to such occurrence shall be deducted from CONTRACTOR's payment applications immediately as they are incurred.
- F. CONTRACTOR is to note that ENGINEER's representative has a limited number of visits to the site available during construction. Should the number of visits be exceeded, additional costs may be incurred by the OWNER. If the CONTRACTOR's operational choices cause these additional visits by the ENGINEER's representative, the cost thereof shall be the CONTRACTOR's responsibility.

#### 6.08 CORRECTION OF DEFICIENCIES

- A. CONTRACTOR shall correct all defective Work as directed by OWNER and/or ENGINEER.
- B. All corrections and/or remedial work shall be made at no additional cost to OWNER.

#### 6.09 PROJECT COMPLETION

- A. CONTRACTOR shall remove all tools, equipment, and excess material from jobsite.
- B. CONTRACTOR shall remove and legally dispose of all debris generated during the work.
- C. CONTRACTOR shall remedy all work deficiencies, and public and private damage issues to the satisfaction of the OWNER and ENGINEER.
- D. CONTRACTOR shall fulfill all Final Project Submittal requirements.
- E. Upon completion of the Work, all staging scaffolding and containers shall be removed from the site and/or destroyed by the CONTRACTOR in a legal manner. Paint spots, oil or stains upon adjacent surfaces, etc. shall be completely removed and the entire job site left clean and acceptable to the OWNER and ENGINEER.

**PART 7 – DISINFECTION**

## 7.01 EXECUTION

- A. After proper coating systems curing and all interior painting operations are complete, CONTRACTOR shall wash out the interior using clean, potable water at a minimum pressure of 3000 psi.
- B. After washout, CONTRACTOR shall disinfect the water storage tank in accordance with AWWA C652 Standard for Disinfection of Water-Storage Facilities and in a methodology allowing the OWNER to utilize the disinfected potable water in the tank without refilling.
- C. OWNER shall provide one (1) full tank of water for disinfection.
- D. Water quality testing and sampling shall be in accordance with all state and local laws and regulations.
- E. Water quality sample(s) retrieval and testing shall be the responsibility of CONTRACTOR, and shall be witnessed and overseen by the OWNER. All sampling shall be coordinated with the OWNER.
- F. In the event of unsatisfactory tests results, CONTRACTOR shall remedy the water quality issues. CONTRACTOR shall pay for water disposal, additional water for re-filling and additional water quality sampling and testing at current rates charged by the OWNER.
- G. A minimum of seven (7) days after all coatings applications are complete shall pass prior to sterilizing the tank and filling with water. Coatings manufacturer's written instructions shall supersede this requirement and shall be followed for cure times at various temperatures.

**PART 8 - GUARANTEE AND ANNIVERSARY INSPECTION**

- 8.01 In accordance with AWWA D102 all work shall be warranted for a period of one year from the date of completion.
- 8.02 The OWNER will notify the CONTRACTOR at least 30 days prior to the anniversary date and shall establish a date for the inspection. The OWNER's representative and the CONTRACTOR (if desired) shall thoroughly inspect all surfaces both inside and out. Any defects in the coating system shall be repaired by the CONTRACTOR at no additional cost to the OWNER. Should a failure occur to 25% of the painted surface, either interior or exterior, the entire surface shall be cleaned and painted in accordance with the

Contract Documents. Warranty inspection may be performed with the tank in service at the OWNER's discretion.

## PART 9 - PRODUCT PERFORMANCE CRITERIA

The CONTRACTOR Shall provide the following product information and **manufacturers published performance** data should coatings or coating system be submitted in lieu of the standard of quality established in the project documents. Should the data not be available in a published format (or certified test reports), or if the duration of the test does not meet the specified requirement, please respond in the appropriate space with NT (Not Tested).

### 9.01 NSF APPROVED EPOXY (Interior Intermediate & Finish)

- A. Generic Type: Polyamidoamine Epoxy
- B. Special Qualifications: Certified in accordance with ANSI/NSF Std 61 for contact with potable water in tanks of 1,000 gallons capacity or greater.
- C. Solids By Volume: 67%.
- D. Test Criteria:

Test Criteria	Test Duration	Proposed Product Test Results
ASTM B 117 Salt Spray (Fog)	10,000 hours (Scribed Panel)	Rust @ Scribe: Plane Rust: Blisters:
ASTM G 85 Prohesion	5,000 Hours	Rust @ Scribe: Plane Rust: Blisters:
ASTM D 4585 Humidity	10,000 hours	Rusting: Blistering:
ASTM D 4060 Abrasion	CS-17 Wheel 1,000 Gram Load 1,000 Cycles	Report mg Loss / Average of three tests
ASTM 4541 Adhesion	Average of Three Tests	Adhesion PSI:
Immersion Service (Potable Water)	2 years – No Failure	

## 9.02 EXTERIOR FINISH COAT

- A. Generic Type: Polyfunctional Aliphatic Polyurethane  
 B. Solids By Volume: 72%.  
 C. Test Criteria:

Test Criteria	Test Duration	Proposed Product Test Results
ASTM B 117 Salt Spray (Fog)	2,500 hours (Scribed Panel)	Rust @ Scribe: Plane Rust: Blisters:
		:
ASTM D 4585 Humidity	2,000 hours	Rusting: Blistering:
ASTM D 4060 Abrasion	CS-17 Wheel 1,000 Gram Load 1,000 Cycles	Report mg Loss / Average of three tests
ASTM 4541 Adhesion	Average of Three Tests	Report PSI
ASTM D 522 Flexibility	Method A Conical Mandrel	% Elongation:
ASTM D 522 Flexibility	Method B Cylindrical Mandrel	% Gloss Retention: Color Change:
ASTM D 4587	10,000 hours	Gloss Retention Color Change

## 9.03 EXTERIOR LOGOS AND LETTERING COAT

- A. Generic Type: Fluoropolymer Polyurethane  
 B. Solids By Volume: 60%.  
 C. Test Criteria:

Test Criteria	Test Duration	Proposed Product Test Results
ASTM B 117 Salt Spray (Fog)	10,000 hours (Scribed Panel)	Rust @ Scribe: Plane Rust: Blisters:
ASTM D 4585 Humidity	3,000 hours	Rusting: Blistering:

ASTM D 4060 Abrasion	CS-17 Wheel 1,000 Gram Load 1,000 Cycles	Report mg Loss / Average of three tests
ASTM 4541 Adhesion	Average of Three Tests	Report PSI
ASTM D 4587 QUV Exposure Cycle 4: 8 hours UV – 4 hours condensation	16,000 hours	Gloss Retention: Color Change: DED FMCI
	25,000 hours	Gloss Retention: Color Change: DED FMCI
ASTM D 4141 (EMMAQUA) Exterior Exposure	1,260MJ/m2 UV Exposure*	Gloss Retention: Color Change:
	3,500MJ/m2 UV Exposure*	Gloss Retention: Color Change:
ASTM D 522 Flexibility	Method A Conical Mandrel	Cracking: % Elongation:
ASTM 2794 Impact	Average of Three Trials	Direct Impact:
ASTM D 503`1 Weatherometer	5,500 hours	% Gloss Retention: Color Change: DED
AAMA 2604-98	5 Years 45° - South Florida	Report: Color Retention Gloss Retention Chalking Film Erosion

\* Values must be presented in UV Exposure and not Global Exposure. Submitting manufacturer shall provide certified EMMAQUA test report

END OF SECTION



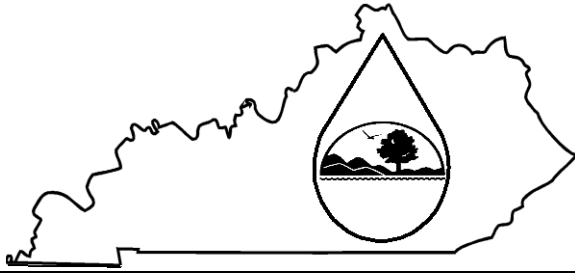
**APPENDIX 1**

**STORMWATER NOI & NOT**

**(To Be Completed and Filed by CONTRACTOR)**



# FORM NOI-SWCA



## KENTUCKY POLLUTION DISCHARGE ELIMINATION SYSTEM (KPDES)

**Notice of Intent (NOI) for coverage of Storm Water  
Discharges Associated with Construction Activities Under  
the KPDES Storm Water General Permit KYR100000**

This is an application for:

- New construction activity.  
 Modification of coverage for additional area in same watershed.  
 Modification of coverage for additional area in different watershed.

If Modification is checked, state reason for Modification:

For Agency Use	Permit No. (Leave Blank)	<b>K</b>	<b>Y</b>	<b>R</b>	<b>1</b>	<b>0</b>				
For Agency Use	AI ID (Leave Blank)									

### SECTION I – FACILITY OPERATOR INFORMATION

Operator Name(s)*:		Phone:*	
Mailing Address:*		Status of Owner/Operator: <input type="checkbox"/> Private <input type="checkbox"/> State <input type="checkbox"/> Federal <input type="checkbox"/> Public (other than state or federal)	
City:*	State:*	Zip Code:*	

### SECTION II – FACILITY/SITE LOCATION INFORMATION

Name of Project:*	Physical Address:*	City:*
State:*	Zip Code:*	County:*
Latitude (decimal degrees):*	Longitude (decimal degrees):*	SIC Code:*

### SECTION III – SITE ACTIVITY INFORMATION

For single projects provide the following information

Total Number of acres in project:*	Total Number of acres to be disturbed:*	Start date:	Completion date:
------------------------------------	---	-------------	------------------

For common plans of development projects provide the following information

Total Number of acres in project:*	Number of individual lots in development:	Number of lots to be developed:
Total acreage intended to be disturbed:*	Number of acres intended to be disturbed at any one time:	
Start date:	Completion date:	List Contractors:

### SECTION IV – DISCHARGE TO A WATER BODY

Name of Receiving Water:*	Anticipated number of discharge points:
Location of anticipated discharge points: Latitude (decimal degrees):*	Longitude (decimal degrees):*
Receiving Water Body Stream Use Designation	<input type="checkbox"/> Cold Water Aquatic Habitat <input type="checkbox"/> Domestic Water Supply <input type="checkbox"/> Outstanding State Resource Water <input type="checkbox"/> Secondary Contact Recreation <input type="checkbox"/> Primary Contact Recreation <input type="checkbox"/> Warm Water Aquatic Habitat
Antidegradation Categorization	<input type="checkbox"/> Outstanding National Resource Water <input type="checkbox"/> Exceptional Water <input type="checkbox"/> High Quality Water <input type="checkbox"/> Impaired Water
Name of Receiving Water:*	Anticipated number of discharge points:
Location of anticipated discharge points: Latitude (decimal degrees):*	Longitude (decimal degrees):*
Receiving Water Body Stream Use Designation	<input type="checkbox"/> Cold Water Aquatic Habitat <input type="checkbox"/> Domestic Water Supply <input type="checkbox"/> Outstanding State Resource Water <input type="checkbox"/> Secondary Contact Recreation <input type="checkbox"/> Primary Contact Recreation <input type="checkbox"/> Warm Water Aquatic Habitat
Antidegradation Categorization	<input type="checkbox"/> Outstanding National Resource Water <input type="checkbox"/> Exceptional Water <input type="checkbox"/> High Quality Water <input type="checkbox"/> Impaired Water

# FORM NOI-SWCA

<b>SECTION V – DISCHARGE TO AN MS4</b>			
Name of MS4:		Date of application /notification to the MS4 for construction site coverage:	
Number of discharge points:	Location of each discharge point: Latitude (decimal degrees):*		Longitude (decimal degrees):*
<b>SECTION VI – CONSTRUCTION ACTIVITIES IN OR ALONG A WATER BODY</b>			
Will the project require construction activities in a water body or the riparian zone: <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, describe scope of activity:			
Is a Clean Water Act 404 permit required: <input type="checkbox"/> Yes <input type="checkbox"/> No		Is a Clean Water Act 401 Water Quality Certification required: <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>SECTION VII – NOI PREPARER INFORMATION</b>			
First Name:*	Last Name:*	Phone :*	eMail Address:*
Mailing Address:*	City:*	State:*	Zip Code:*
<b>SECTION VIII – ATTACHMENTS</b>			
Attach a full size color USGS 7½-minute quadrangle map with the facility site clearly marked. USGS maps may be obtained from the University of Kentucky, Mines and Minerals Bldg. Room 106, Lexington, Kentucky 40506. Phone number (859) 257-3896.			
<b>SECTION IX – CERTIFICATION</b>			
<b>I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.</b>			
Signature:*		First Name:*	Last Name:*
Phone:*	eMail Address:		Date:*

This completed application form and attachments should be sent to: SWP Branch, Division of Water, 200 Fair Oaks, Frankfort, Kentucky 40601. Questions should be directed to: SWP Branch, Operational Permits Section at (502) 564-3410.

# KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM FORM NOI-SWCA – INSTRUCTIONS

## WHO MUST FILE A NOTICE OF INTENT (NOI) FORM

Federal law at 40 CFR Part 122 prohibits point source discharges of stormwater associated with industrial activity to a water body of the Commonwealth of Kentucky without a Kentucky Pollutant Discharge Elimination System (KPDES) permit. The operator of an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under the KPDES Storm Water General Permit. If you have questions about whether you need a permit under the KPDES Storm Water program, or if you need information as to whether a particular program is administered by the state agency, call the **Storm Water Contact, Operational Permits Section, Kentucky Division of Water at (502) 564-3410**.

## WHERE TO FILE NOI FORM

NOIs must be sent to the following address or submitted in on-line at <https://dep.gateway.ky.gov/eForms/Default.aspx?FormID=3>:

Operational Permits Section  
SWP Branch, Division of Water  
200 Fair Oaks Lane  
Frankfort, KY 40601

**Electronic NOI-SWCAs are to be submitted a minimum of seven (7) working days prior to commencement of construction related activities. Paper NOI-SWCAs are to be submitted a minimum of thirty (30) working days prior to commencement of construction related activities.**

## COMPLETING THE FORM

Enter information in the appropriate areas only. (\*) denotes a required field. Enter N/A (Not Applicable) for fields that are required but do not apply to your submission. If you have any questions regarding the completion of this form call the **Storm Water Contact, Operational Permits Section, at (502) 564-3410**.

### SECTION I – FACILITY OPERATOR INFORMATION

**Operator Name(s):** Enter the name or names of all operators applying for coverage under KYR10 using this NOI.  
**Mailing Address, City, State, and Zip Code:** Provide the mailing address of the primary operator  
**Phone No.:** Provide the telephone numbers of the person who is responsible for the operation.  
**Status of Owner/Operator:** Select the appropriate legal status of the operator of the facility from the dropdown list.

Federal  
Public (other than federal or state)  
State  
Private

### SECTION II – FACILITY/SITE LOCATION INFORMATION

**Name of Project:** Provide the name of the project.  
**Physical Address, City, State, Zip Code and County:** Provide the physical address of the project.  
**Latitude/Longitude:** Provide the general site latitude and longitude of the operation.  
**SIC Code:** Enter the Standard Industrial Code for the project

### SECTION III – SITE ACTIVITY INFORMATION

**For single projects provide the following information:**

**Total number of acres in project:** Indicate the total acreage of the project including both disturbed and undisturbed areas.  
**Total number of acres to be disturbed:** Indicate the total number of acres of the project to be disturbed.  
**Anticipated start date:** Indicate the approximate date of when construction activities will begin.  
**Anticipated completion date:** Indicated the approximate date of when final stabilization will be achieved.

**For common plans of development provide the following information:**

**Total number of acres in project:** Indicate the total acreage of the project including both disturbed and undisturbed areas.  
**Number of individual lots in development, if applicable:** Indicate the number of individual lots or unit in the common plan of development  
**Number of lots to be developed:** Indicate the number of lots that you intend to develop.  
**Total acreage of lots intended to develop:** Indicate the total acreage of the lots you intend to develop  
**Total acreage intended to disturb:** Indicate the total acreage of the lots you intend to disturb  
**Number of acres intended to disturb at any one time:** Indicate the maximum number of acres to be disturbed at any one time.  
**Anticipated start date:** Indicate the approximate date of when construction activities will begin.  
**Anticipated completion date:** Indicated the approximate date of when final stabilization will be achieved.  
**List of contractors:** Provide the names of all known contractors that will be working on site.

# KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM FORM NOI-SWCA – INSTRUCTIONS

## SECTION IV – IF THE PERMITTED SITE DISCHARGES TO A WATER BODY THE FOLLOWING INFORMATION IS REQUIRED

**Name of Receiving Water:** Provide the names of the each water body receiving discharges from the site. Provide only official USGS names do not provide local names

**Anticipated number of discharge points:** Indicate the number of discharge points to each receiving water body.

**Location of anticipated discharge points:** Provide the latitude and longitude of each discharge point. Add points as necessary.

**Receiving Water Body Stream Use Designation:** Check all appropriate boxes

**Antidegradation Categorization:** Select from the drop down box one of the following:

Outstanding National Resource Water

Exceptional Water

High Quality Water

Impaired Water

## SECTION V – IF THE PERMITTED SITE DISCHARGES TO A MS4 THE FOLLOWING INFORMATION IS REQUIRED

**Name of MS4:** Provide the name of the MS4 to which the activity will discharge

**Number of discharge points to the MS4:** Indicate the number of discharge points

**Location of each discharge point:** Provide the latitude and longitude of each discharge point. Add points as necessary

**Date of application/notification to the MS4 for construction site permit coverage:** Indicate the date the MS4 has or will be notified.

## SECTION VI – CONSTRUCTION ACTIVITIES IN OR ALONG A WATER BODY

**Will the project require construction activities in a water body or the riparian zone:** Select Yes or No from the drop down box.

**If Yes, describe scope of activity:** Provide a brief description of the activity (ies) that will take place in the water body or the riparian zone.

**Is a Clean Water Act 404 permit required:** Select Yes or No from the drop down box.

**Is a Clean Water Act 401 Water Quality Certification required:** Select Yes or No from the drop down box.

## SECTION VII – NOI PREPARER INFORMATION

Provide the name, mailing address, telephone number and eMail address of the person preparing the NOI.

## SECTION VIII – Attachments

**Attach a USGS topographic map indicating the location of the activity and the proposed discharge points.**

## SECTION IX – CERTIFICATION

Provide the name, mailing address, telephone number and eMail address of the person who is responsible for the activity

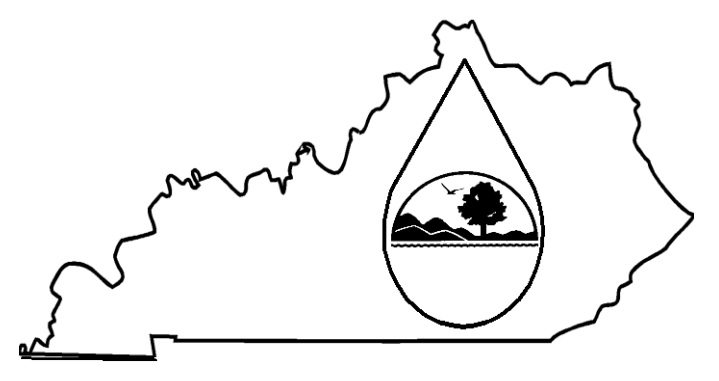
**Signature:** Provide full name of the responsibility party. This will constitute a signature.

The NOI must be signed as follows:

**Corporation:** by a principal executive officer of at least the level of vice president

**Partnership or sole proprietorship:** by a general partner or the proprietor respectively

# KPDES FORM NOT-SW

	<p>Kentucky Pollutant Discharge Elimination System (KPDES)</p> <p><b>NOTICE OF TERMINATION (NOT)</b> of Coverage Under the KPDES General Permit for Storm Water Discharges Associated with Industrial Activity</p>
---	--

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with industrial activity under the KPDES program.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.  
(Please see instructions on back before completing this form.)

## I. PERMIT INFORMATION

KPDES Storm Water General Permit Number:
Check here if you are no longer the Operator of the Facility: <input type="checkbox"/>
Check here if the Storm Water Discharge is Being Terminated: <input type="checkbox"/>

## II. FACILITY OPERATOR INFORMATION

Name:
Address:
City/State/Zip Code:
Telephone Number:

## III. FACILITY/SITE LOCATION INFORMATION

Name:
Address:
City/State/Zip Code:

**Certification:** I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a KPDES general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity of waters of the Commonwealth is unlawful under the Clean Water Act and Kentucky Regulations where the discharge is not authorized by a KPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Kentucky Revised Statutes.

NAME (Print or Type)	TITLE
SIGNATURE	DATE

**INSTRUCTIONS**  
**NOTICE OF TERMINATION (NOT) OF COVERAGE UNDER THE KPDES GENERAL PERMIT**  
**FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY**

**Who May File a Notice of Termination (NOT) Form**

Permittees who are presently covered under the Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Storm Water Discharges Associated with Industrial Activity may submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26 (b)(14), or when they are no longer the operator of the facilities.

For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a KPDES general permit have otherwise been eliminated. Final stabilization means that all soil-disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles have been employed.

**Where to File NOT Form**

Send this form to the following address:

**Section Supervisor  
Inventory & Data Management Section  
KPDES Branch, Division of Water  
14 Reilly Road, Frankfort Office Park  
Frankfort, KY 40601**

**Completing the Form**

Type or print legibly in the appropriate areas and according to the instructions given for each section. If you have questions about this form, call the Storm Water Contact, Industrial Section, at (502) 564-3410.

**Section I - Permit Information**

Enter the existing KPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, **call the Storm Water Contact, Industrial Section at (502) 564-3410.**

Indicate your reason for submitting this Notice of Termination by checking the appropriate box:

If there has been a change of operator and you are no longer the operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

**Section II - Facility Operator Information**

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

**Section III - Facility/Site Location Information**

Enter the facility's or site's official or legal name and complete address, including city, state and ZIP code. If the facility lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

**Section IV - Certification**

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

*For a corporation:* by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

*For a partnership or sole proprietorship:* by a general partner or the proprietor; or

*For a municipality, State, Federal, or other public facility:* by either a principal executive



**APPENDIX 2**

**PROPERTY OWNER RELEASE FORM**



# RELEASE

I/We, \_\_\_\_\_, in consideration of work

(Printed Name of Owner)

performed to date on the Water System Improvements Project – 1,000,000 Gallon Elevated Tank

(Name of Project)

including backfilling, grading, disposal of excavated and waste material, seeding and mulching, etc., hereby release the Jessamine County Water District No. 1 and its

(Name of Project Owner)

contractor \_\_\_\_\_ from claims

(Name of Contractor)

arising from the construction process. I/We reserve the right to request that the contractor noted above, through the project owner, return during the one-year warranty period established for the referenced project to address deficiencies, should portions of the disturbed areas fail to achieve adequate grass cover or other items constructed fail to meet normal and reasonable expectations. Any claim shall be reviewed by the project owner, or representative thereof, to determine the legitimacy of the claim.

---

(Location: Street Address, City, State and Contact Number)

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

X \_\_\_\_\_

Witness: \_\_\_\_\_



## **APPENDIX 3**

### **DIVISION OF WATER APPROVAL**





STEVEN L. BESHEAR  
GOVERNOR

LEONARD K. PETERS  
SECRETARY

**ENERGY AND ENVIRONMENT CABINET**

DEPARTMENT FOR ENVIRONMENTAL PROTECTION

DIVISION OF WATER

200 FAIR OAKS LANE, 4TH FLOOR

FRANKFORT, KENTUCKY 40601

[www.kentucky.gov](http://www.kentucky.gov)

December 22, 2014

Mr. Carl Waits  
Jessamine Co Water District No. 1  
2225 Lexington Rd  
Nicholasville, KY 40356

RE: Jessamine Co Water District No 1  
AI # 33935, APE20140001  
PWSID # 0570214-14-001  
Water System Improvements- WLE, BPS and  
Water Tank  
Jessamine County, KY

Dear Mr. Waits:

We have reviewed the plans and specifications for the above referenced project. The plans include the construction of approximately 1,300 feet of 12-inch PVC Waterline; a Booster Pump Station with 2 pumps at 600 gpm with 85.5 feet TDH and an Elevated Water Storage Tank of 1.0 millions gallons capacity with active mixing system. This is to advise that plans and specifications for the above referenced project are APPROVED with respect to sanitary features of design, as of this date and the requirements contained in the attached construction permit.

Jessamine County Water District No. 1 (JCWD1) shall be able to demonstrate the effectiveness of the mixing system one year after the mixing system is installed and operational. Since there is no existing tank, JCWD1 will not be asked to provide the demonstration parameters in advance.

If you have any questions concerning this project, please contact Mr. Mohammed Mohiuddin at 502-564-3410 extension 4827.

Sincerely,

A handwritten signature in cursive script that reads "Mark Rasche".

Mark Rasche, P.E.  
Supervisor, Engineering Section  
Water Infrastructure Branch  
Division of Water

MR: MM  
Enclosures

C: HMB Professional Engineers, Inc.  
Jessamine County Health Department  
Public Service Commission (by e-mail only)  
Division of Plumbing (by e-mail only)





## **APPENDIX 4**

### **GEOTECHNICAL REPORT**



**REPORT OF GEOTECHNICAL  
EXPLORATION**

**JESSAMINE COUNTY WATER DISTRICT**

**BRANNON ROAD ELEVATED TANK**

**JESSAMINE COUNTY, KENTUCKY**

**PREPARED BY:**

**AMERICAN ENGINEERS, INC.  
FIELD SERVICES CENTER**

**APRIL, 2010**



**AEI**

**AMERICAN ENGINEERS, INC.**

**PROFESSIONAL ENGINEERING**

[www.aei.cc](http://www.aei.cc)



65 Aberdeen Drive  
Glasgow, KY 42141  
Office (270) 651- 7220  
Fax (270) 651- 3246

April 12, 2010

Mr. Chris A. Stewart, PE  
Water/Wastewater Division Manager  
HMB Professional Engineers, Inc.  
3 HMB Circle  
Frankfort, KY 40601

Re: Report of Geotechnical Exploration  
Jessamine County Water District  
Brannon Road Elevated Tank  
Jessamine County, Kentucky  
AEI Project No. 210-029

Dear Mr. Stewart:

American Engineers, Inc. Field Services Center is pleased to submit this geotechnical report that details the results of our geotechnical exploration performed at the above referenced site.

The attached report describes the site and subsurface conditions and also details our recommendations for the proposed project. The Appendix to the report contains a drawing with a boring layout, typed boring logs, the results of all laboratory testing, and corresponding recommendations.

We appreciate the opportunity to be of service to you on this project and hope to provide further support on this and other projects in the future. Please contact us if you have any questions regarding this report.

Respectfully,  
AMERICAN ENGINEERS, INC.

Dusty Barrett, E.I.T.  
Geotechnical Engineer

Dennis Mitchell, P.E.  
Director of Geotechnical  
Services

**REPORT OF GEOTECHNICAL EXPLORATION  
JESSAMINE COUNTY WATER DISTRICT  
BRANNON ROAD ELEVATED TANK  
JESSAMINE COUNTY, KENTUCKY**

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# REPORT OF GEOTECHNICAL EXPLORATION JESSAMINE COUNTY WATER DISTRICT BRANNON ROAD ELEVATED TANK JESSAMINE COUNTY, KENTUCKY

## 1 GENERAL SITE DESCRIPTION

The site is located near the intersection of US 27 and Brannon Road in northern Jessamine County, Kentucky. The ground surface in the immediate vicinity of the proposed tank is relatively flat with little elevation change. The terrain can generally be described as gently rolling to rolling.

A one million gallon elevated water storage tank is planned at the site. The tank is anticipated to be 75 feet in diameter with nine legs and a center riser. It is our understanding that the total vertical load on the center riser will be on the order of about 3,500 kips, and the load on the outside columns will be on the order of about 680 kips. Lateral loads on the column piers due to wind are about 79.9 kips and lateral loads on the column piers due to earthquakes are 198.3 kips.

## 2 GENERAL SITE GEOLOGY

Available geologic mapping (*Geologic Map of the Nicholasville Quadrangle, Kentucky, USGS, 1968*) shows the site to be underlain by the Lexington Limestone Formation of the upper to middle Ordovician Series. More specifically, the site is underlain by the Tanglewood Limestone and Brannon Members. The Tanglewood Limestone can be described as limestone with some minor shale, light gray, medium to coarse grained, thin to thick bedded, crossbedded and siliceous in part and bioclastic with dominant tabular beds. The shale parts can be described as medium gray, limy, thin bedded and mostly interlaminated with shaly limestone in thin partings between the limestone beds.

The Brannon Member can be described as limestone and shale (50%) interbedded, medium to dark gray, micro-grained to medium grained, locally siliceous or cherty and tabular bedded. The shale portion can be described as medium to dark gray, locally brownish gray, limy and thin bedded.

There were no obvious surface depressions noted on the site or on surrounding sites during the field exploration, however the Lexington Limestone Formation is known for the development of karst-related features. It should be understood by the owner that there is some risk of future ground subsidence when building in areas where karst activity has been known to historically exist. Several faults are noted on the quadrangle east of the site. This area is known as the Hickman Creek Fault Zone. It is impossible to investigate a site to such an extent to fully identify the possibility of future geologically related problems.

### **3 SCOPE OF WORK PERFORMED**

The geotechnical exploration consisted of drilling five soil borings, three with rock core and six rock soundings within the limits of the proposed tank. Additionally, two soil borings were drilled in the future access road. All borings located in the footprint of the water tank were drilled to auger refusal. Boring locations were staked and elevated utilizing topographic mapping provided by HMB, Inc. A boring layout is included in Appendix A of this report.

The borings were drilled by an AEI drill crew using a truck-mounted drill rig equipped with continuous flight hollow-stem augers and an NQ2-size diamond coring bit. A Geotechnical Engineer was on site throughout the fieldwork to log the soils and rock encountered during the drilling operation. The recovered soil samples and rock core were further classified in the lab by a Geotechnical Engineer.

### **4 RESULTS OF THE EXPLORATION**

#### **4.1 GENERAL**

Information provided in the Appendices for this report includes boring locations, logs of the borings, and other relevant geotechnical information. A description of the subsurface soil, bedrock and groundwater conditions follows.

#### **4.2 SUBSURFACE SOIL CONDITIONS**

The generalized subsurface conditions encountered at the boring locations, including descriptions of the various strata and their depths and thicknesses are presented on the Boring Logs in Appendix B.

From four to 12 inches of topsoil was encountered with an average depth of about nine inches. The borings encountered lean clay soils beneath the topsoil. The lean clay can be described as brown to reddish brown with trace to some fine sand and gravel, moist to wet and medium stiff to stiff.

SPT-N values in the residual clays ranged from three to 27 blows per foot (bpf) with most between eight and 14 bpf excluding SPT-N values of 50+. Corresponding estimated unconfined compressive strength ( $Q_p$ ) values ranged from about 0.25 to 4.5+ tons per square foot (tsf) with most values between two and four. Together, the SPT-N and  $Q_p$  values are indicative of medium stiff to stiff strength consistencies.

Atterberg limits testing was performed on representative samples and the results indicate that the near-surface clay soils classify as CL (Clay of Low plasticity), lean clay in accordance with the USCS. Liquid limit test results ranging from 39 to 42 percent were obtained with corresponding plasticity indexes ranging from



19 to 20 percent. Moisture contents of the residual clays range from about 22 to 52 percent with most between 26 to 39 percent. Results of Atterberg limits and moisture content testing indicate that the residual clays are typically about 5 to 20 percent wet of the plastic limit with the wettest materials encountered at depth.

#### **4.3 BEDROCK CONDITIONS**

Refusal, as indicated by the driller on the field boring logs, indicates a depth where either essentially no downward progress can be made by the auger or where the N-value indicates essentially no penetration of the split-spoon sampler. It is normally indicative of a very hard or very dense material such as large boulders or the upper bedrock surface. At this site, auger refusal was encountered in every boring drilled in the tank footprint. Refusal depths varied from about 20 to almost 24 feet. Based on review of the recovered rock core, the bedrock can typically be described as limestone with interbedded shale, light gray to dark gray, medium crystalline, laminated to thick bedded and moderately hard. Core recovery percentages ranged from 45 to 100 percent with most values from 84 to 100 percent. Rock Quality Designation (RQD) values ranged from 30 to 100 percent with most values from 70 to 100. In each of the borings, weathered claystone/ shale was encountered sporadically throughout the rock core with thickness up to one foot.

#### **4.4 GROUNDWATER CONDITIONS**

Groundwater was not encountered in any of the borings during drilling. In cohesive soils such as those encountered at the site, a long time is required for the hydrostatic groundwater level to come to equilibrium in the borehole. The short-term groundwater levels reported by the drill crew are not generally indicative of the long-term groundwater level. To accurately determine the long-term groundwater level, as well as the seasonal and precipitation induced fluctuations of the groundwater level, it is necessary to install piezometers in the borings, and monitor them for an extended length of time. Frequently, groundwater conditions affecting construction in this region are caused by trapped or perched groundwater, which occurs within the soil materials or at the soil/rock interface in irregular, discontinuous locations. If these water bodies are encountered during excavation, they can produce seepage durations and rates that will vary depending on the recent rainfall activity and the hydraulic conductivity of the material.

#### **4.5 SEISMIC CONDITIONS**

According to the Kentucky Building Code, 2002 Edition, and the subsurface conditions encountered in the borings, Site Class B should be utilized for foundations bearing on bedrock.

Soil liquefaction analysis was outside the scope of this investigation. Prior studies in this region on similar soil types indicate that the potential for liquefaction is low and is primarily dependent on the variability of site soils and earthquake severity.

Consideration for seismic loading and liquefaction potential beyond this level of investigation is left to the discretion of the structural framing and foundation design engineer.

## **5 ANALYSES AND RECOMMENDATIONS**

The recommendations that follow are based on our conceptual understanding of the project. As the site design is advanced, please notify us of any significant design changes so that our recommendations can be reviewed and modified as necessary.

### **5.1 General Site Work**

#### **5.1.1 On-Site Soils**

The on-site soils are suitable for use as fill material, provided close control is maintained over the moisture content at placement. The surficial site soils are moderate plasticity clays with USCS classifications of CL (Clay of Low plasticity).

#### **5.1.2 Excavations**

Foundation excavations should be properly sloped back in accordance with the Kentucky Occupational Safety and Health Standards for the Construction Industry 29 CFR Part 1926, Subpart P – Excavations. The soil overburden at the site should be classified as Type B soil in accordance with the above standard. Below the auger refusal depths recorded on the borings logs, the limestone bedrock can be classified as stable rock. Soil at the site should be laid back on a slope of 1 Horizontal: 1 Vertical (1H: 1V) while rock may be excavated with vertical walls.

### **5.2 Structure Foundations**

#### **5.2.1 Recommended Bearing and Skin Friction Values**

Since loads for the tank are relatively heavy and the tank is settlement sensitive, it is recommended that foundations be designed to bear on bedrock. Foundations can consist of direct bearing footings or drilled shafts extending to the bedrock surface. Drilled shafts and spread footings can be sized based on an allowable end bearing capacity of 50 ksf.

Drilled shafts should be a minimum of 30 inches in diameter to permit inspection.

A recommended bearing elevation has been established at each of the rock core boring locations based on review of the recovered rock core. The recommended bearing elevations (for axial loads) are shown on the attached boring logs.

It is recommended that drilled shafts extend through the weathered limestone bedrock in order to bear on the underlying, unweathered bedrock. Based on review of the recovered rock core, less than one foot weathered limestone may be encountered at the bedrock surface at the site.

In areas where drilled shafts extend several feet into bedrock, it may be appropriate for the foundation design engineer to include the resistance derived from skin friction from the portion of drilled shafts socketed below the bedrock surface. An allowable unit side resistance of 6 ksf can be utilized for compression loading, with a corresponding value of 4 ksf for uplift loading. The upper one foot of bedrock should be neglected when calculating skin friction and uplift capacities.

### **5.2.2 Acceptance of Foundation Bearing Surfaces**

Prior to placement of reinforcing steel in spread footings and drilled shafts, an AEI Engineer or Engineering Technician should review the bearing surface to verify that the design bearing capacity provided can be achieved. The drilled shafts should also be reviewed to verify that the bottom is level and free of mud, loose soil or other questionable material that might affect foundation support. Also, a 1.5-inch diameter percussion test hole should be drilled at the bottom of each drilled shaft to a depth of twice the shaft diameter (5 feet minimum) to allow probing of the sidewalls with a hooked probe. The percussion test holes will allow the Engineer or Technician to verify the continuity of the underlying bedrock. If voids or zones of questionable bearing material are detected, it may be necessary to deepen the drilled shaft. As an alternative to drilling percussion test holes, rock core borings can be drilled at each of the shaft locations.

### **5.2.3 Groundwater**

Any groundwater encountered in spread footing or drilled shaft excavations should be removed prior to concrete placement. Some zones of seepage may be present at the soil/rock interface depending on the time of year construction takes place.

## **5.3 TANK FOUNDATIONS**

### **5.3.1 Drilled Shaft Construction**

Any groundwater encountered in drilled shaft excavations should be removed prior to concrete placement. Some zones of seepage may be encountered at the

soil/rock interface. The contractor should be prepared to pump any groundwater from the drilled shaft and any other excavations that extend into rock.

Drilled shaft concrete should be placed immediately upon completion of excavation. The use of temporary casing will be necessary to stabilize the shaft during cleaning and inspection, as well as prevent caving of the sidewalls prior to concrete placement. In the unlikely event that water infiltration into the drilled pier shaft cannot be controlled by pumping, the contractor would need to place the concrete under water by appropriate tremie methods. If such methods were not available at the time of shaft excavation, the shaft should be backfilled with spoil until such a time that appropriate equipment and material can be provided to properly complete the shaft.

To reduce lateral movement of the drilled shaft, the contractor must place the drilled shaft concrete in intimate contact with undisturbed natural soil. As such the temporary casing should be pulled concurrent with concrete placement. The contractor must fill any voids or enlargements in the drilled shaft excavations with concrete at the time of concrete placement. To reduce the potential for arching and to provide a workable material, we recommend the drilled shaft concrete mix be designed for a slump of 5 to 7 inches. Should tremie placement of the concrete be required, the concrete mix should be designed with a slump ranging from 7 to 9 inches, without reduction in design strength, to facilitate placement with the tremie tube. A means of preventing concrete from intermixing with the water or slurry must be provided, such as a bottom discharge gate or rubber ball for a tremie pipe, or a pig for use in a concrete pump. In no case should concrete be placed through standing water in the drilled shaft or tremie pipe.

A positive head of concrete, relative to water trapped outside the casing, should always be maintained within the temporary casing to reduce the risk of water and/or soil from infiltrating into the drilled shaft and contaminating the concrete. An improper head balance could potentially cause water and/or soil to flow into the shaft and compromise the concrete integrity. Should tremie placement be required, water, which typically becomes intermixed with the uppermost portion of the concrete, contaminating the concrete, must be completely removed, down to fresh concrete, prior to final concrete placement to complete the drilled shaft when tremie methods are used. The drilled shaft contractor must be experienced and prepared to deal with potentially difficult soil and groundwater conditions.

### ***5.3.2 Potential Foundation Movement***

A detailed settlement analysis was beyond the scope of this investigation. However, based on a crude empirical settlement analysis, it is anticipated that less than ½ inch of total settlement will occur with a rock bearing foundation system.

These estimates assume that the foundations are designed and constructed according to the recommendations in this report and in conjunction with sound foundation construction practice.

#### **5.4 ACCESS ROAD**

For the gravel access road, due to the low CBR value, it is recommended that a one foot layer of No. 2's be placed on the prepared subgrade with a Type IV geotextile fabric between the stone and the soil. Two to four inches of dense graded aggregate (DGA) can be used to cap the No. 2's to provide a driving surface.

#### **5.5 GENERAL CONSIDERATIONS**

##### ***5.5.1 Construction Monitoring/Testing***

All construction operations involving foundation construction should be performed in the presence of an experienced representative of AEI. The representative would operate under the direct supervision of an AEI Geotechnical Engineer. Field observations should be performed prior to and during concrete placement operations.

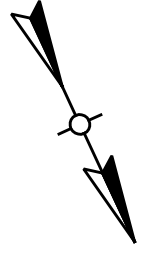
##### ***5.5.2 Limitations***

The conclusions and recommendations presented herein are based on information gathered from the borings advanced during this exploration using that degree of care and skill ordinarily exercised under similar circumstances by competent members of the engineering profession. No warranties can be made regarding the continuity of conditions between the borings.

We will retain samples acquired for this project for a period of 30 days subsequent to the submittal date printed on the cover of this report. After this period, the samples will be discarded unless otherwise requested.

# **Appendix A**

## **Boring Layout**

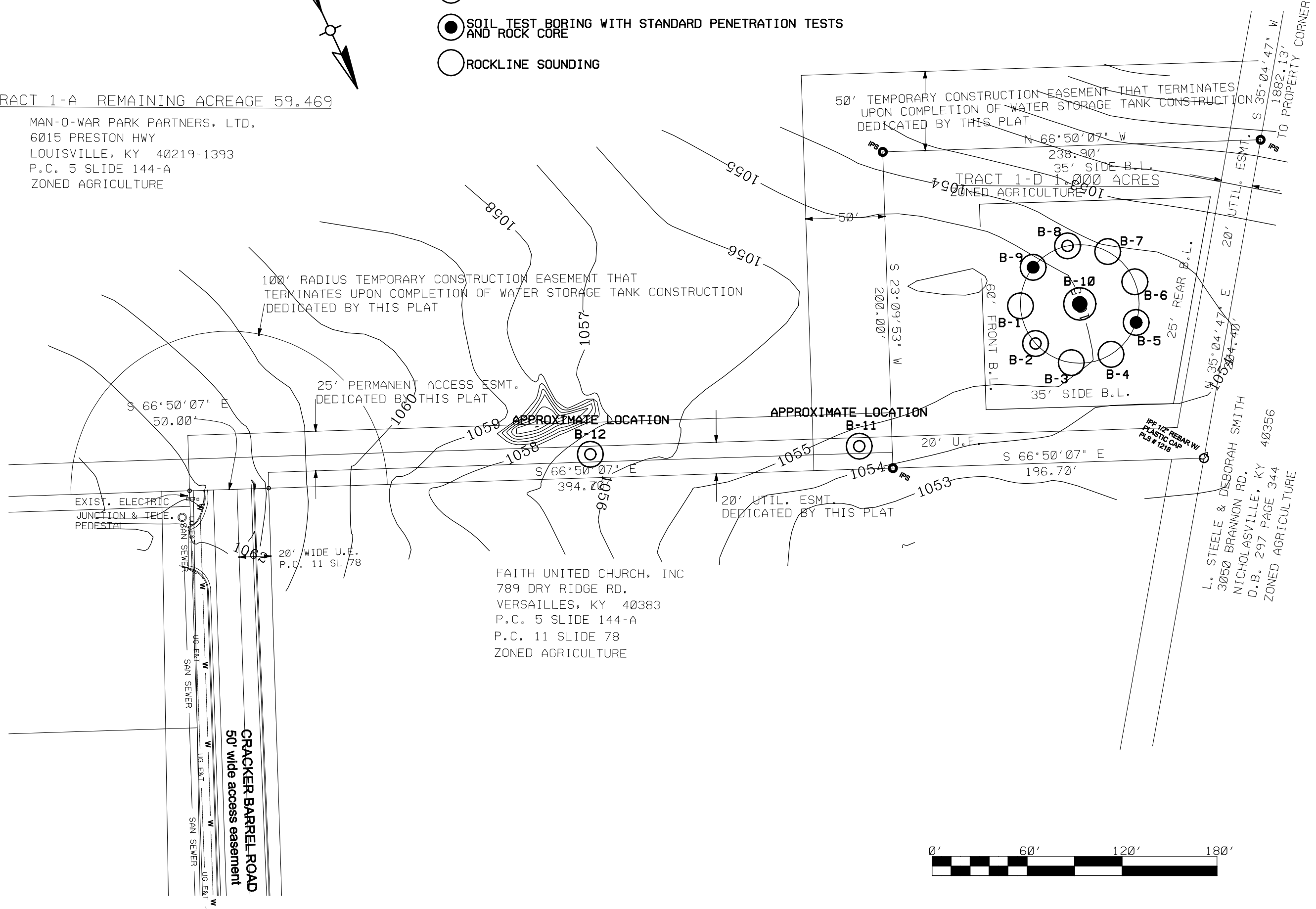


**LEGEND**

- SOIL TEST BORING WITH STANDARD PENETRATION TESTS
- SOIL TEST BORING WITH STANDARD PENETRATION TESTS AND ROCK CORE
- ROCKLINE SOUNDING

TRACT 1-A REMAINING ACREAGE 59.469

MAN-O-WAR PARK PARTNERS, LTD.  
 6015 PRESTON HWY  
 LOUISVILLE, KY 40219-1393  
 P.C. 5 SLIDE 144-A  
 ZONED AGRICULTURE



NO.	DATE	DESCRIPTION

**BORING LAYOUT**

CLIENT:  
**HMB, INC.**

PROJECT:  
**JESSAMINE COUNTY WATER DISTRICT BRANNON ROAD ELEVATED TANK**

PLANNED PROFESSIONAL ENGINEERING BY:  
**AMERICAN ENGINEERS, INC.**  
 PROFESSIONAL ENGINEERING  
 2000 Market Street, Lexington, KY 40502  
 (606) 253-4222  
 www.aei.co

SCALE:  
 1"=50'

DATE:  
 3-29-10

DRAWN BY:  
 J. CHILDRESS

CHECKED BY:  
 D. MITCHELL

FILE:  
 7210 Projects/210-029 JCWD Elevated Tank/Boring Layout.dgn

SHEET:  
**B1**



# **Appendix B**

## **Boring Logs**



## **FIELD TESTING PROCEDURES**

The general field procedures employed by the Field Services Center are summarized in the following outline. The procedures utilized by the AEI Field Service Center are recognized methods for determining soil and rock distribution and ground water conditions. These methods include geophysical and in situ methods as well as borings.

**Soil Borings** are drilled to obtain subsurface samples using one of several alternate techniques depending upon the surface conditions. Borings are advanced into the ground using continuous flight augers. At prescribed intervals throughout the boring depths, soil samples are obtained with a split- spoon or thin-walled sampler and sealed in airtight glass jars and labeled. The sampler is first seated 6 inches to penetrate loose cuttings and then driven an additional foot, where possible, with blows from a 140 pound hammer falling 30 inches. The number of blows required to drive the sampler each six-inch increment is recorded. The penetration resistance, or “N-value” is designated as the number of hammer blows required to drive the sampler the final foot and, when properly evaluated, is an index to cohesion for clays and relative density for sands. The split spoon sampling procedures used during the exploration are in general accordance with ASTM D 1586. Split spoon samples are considered to provide *disturbed* samples, yet are appropriate for most engineering applications. Thin-walled (Shelby tube) samples are considered to provide *undisturbed* samples and obtained when warranted in general accordance with ASTM D 1587.

These drilling methods are not capable of penetrating through material designated as “refusal materials.” Refusal, thus indicated, may result from hard cemented soil, soft weathered rock, coarse gravel or boulders, thin rock seams, or the upper surface of sound continuous rock. Core drilling procedures are required to determine the character and continuity of refusal materials.

**Core Drilling Procedures** for use on refusal materials. Prior to coring, casing is set in the boring through the overburden soils. Refusal materials are then cored according to ASTM D-2113 using a diamond bit attached to the end of a hollow double tube core barrel. This device is rotated at high speeds and the cuttings are brought to the surface by circulating water. Samples of the material penetrated are protected and retained in the inner tube, which is retrieved at the end of each drill run. Upon retrieval of the inner tube the core is recovered, measured and placed in boxes for storage.

The subsurface conditions encountered during drilling are reported on a field test boring record by the driller. The record contains information concerning the boring method, samples attempted and recovered, indications of the presence of various materials such as coarse gravel, cobbles, etc., and observations between samples. Therefore, these boring records contain both factual and interpretive information. The field boring records are on file in our office.

The soil and rock samples plus the field boring records are reviewed by a geotechnical engineer. The engineer classifies the soil in general accordance with the procedures outlined in ASTM D 2487 and D 2488 and prepares the final boring records which are the basis for all evaluations and recommendations.

Representative portions of soil samples are placed in sealed containers and transported to the laboratory. In the laboratory, the samples are examined to verify the driller’s field classifications. Test Boring Records are attached which show the soil descriptions and penetration resistances.

The final boring records represent our interpretation of the contents of the field records based on the results of the engineering examinations and tests of the field samples. These records depict subsurface conditions at the specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the subsurface soil and ground water conditions at these boring locations. The lines designate the interface between soil or refusal materials on the records and on profiles represent approximate boundaries. The transition between materials may be gradual. The final boring records are included with this report.

***Water table readings*** are normally taken in conjunction with borings and are recorded on the “Boring Logs”. These readings indicate the approximate location of the hydrostatic water table at the time of our field investigation. Where impervious soils are encountered (clayey soils) the amount of water seepage into the boring is small, and it is generally not possible to establish the location of hydrostatic water table through water level readings. The ground water table may also be dependent upon the amount of precipitation at the site during a particular period of time. Fluctuations in the water table should be expected with variations in precipitation, surface run-off, evaporation and other factors.

The time of boring water level reported on the boring records is determined by field crews as the drilling tools are advanced. The boring water level is detected by changes in the drilling rate, soil samples obtained, etc. Additional water table readings are generally obtained at least 24 hours after the borings are completed. The time lag of at least 24 hours is used to permit stabilization of the ground water table which has been disrupted by the drilling operations. The readings are taken by dropping a weighted line down the boring or using an electrical probe to detect the water level surface.

Occasionally the borings will cave-in, preventing water level readings from being obtained or trapping drilling water above the caved-in zone. The cave-in depth is also measured and recorded on the boring records.

### **Sampling Terminology**

***Undisturbed Sampling:*** Thin-walled or Shelby tube samples used for visual examination, classification tests and quantitative laboratory testing. This procedure is described by ASTM D 1587. Each tube, together with the encased soil, is carefully removed from the ground, made airtight and transported to the laboratory. Locations and depths of undisturbed samples are shown on the “Boring Logs.”

***Bag Sampling:*** Bulk samples of soil are obtained at selected locations. These samples consist of soil brought to the surface by the drilling augers, or obtained from test pits or the ground surface using hand tools. Samples are placed in bags, with sealed jar samples of the material, and taken to our laboratory for testing where more mass material is required (i.e. Proctors and CBR's). The locations of these samples are indicated on the appropriate logs, or on the Boring Location Plan.

# CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

## COHESIVE SOILS (Clay, Silt, and Mixtures)

<u>CONSISTENCY</u>	<u>SPT N-VALUE</u>	<u>Qu/Qp (tsf)</u>	<u>PLASTICITY</u>	
Very Soft	2 blows/ft or less	0 – 0.25	<b>Degree of</b>	<b>Plasticity</b>
Soft	2 to 4 blows/ft	0.25 – 0.49	<b><u>Plasticity</u></b>	<b><u>Index (PI)</u></b>
Medium Stiff	4 to 8 blows/ft	0.50 – 0.99	Low	0 – 7
Stiff	8 to 15 blows/ft	1.00 – 2.00	Medium	8 – 22
Very Stiff	15 to 30 blows/ft	2.00 – 4.00	High	over 22
Hard	30 blows/ft or more	> 4.00		

## NON-COHESIVE SOILS (Silt, Sand, Gravel, and Mixtures)

<u>DENSITY</u>	<u>SPT N-VALUE</u>	<u>PARTICLE SIZE IDENTIFICATION</u>	
Very Loose	4 blows/ft or less	Boulders	12 inch diameter or more
Loose	4 to 10 blows/ft	Cobbles	3 to 12 inch diameter
Medium Dense	10 to 30 blows/ft	Gravel	Coarse – 1 to 3 inch
Dense	30 to 50 blows/ft		Medium – ½ to 1 inch
Very Dense	50 blows/ft or more		Fine – ¼ to ½ inch
		Sand	Coarse – 0.6mm to ¼ inch
			Medium – 0.2mm to 0.6mm
			Fine – 0.05mm to 0.2mm
		Silt	0.05mm to 0.005mm
		Clay	0.005mm

### RELATIVE PROPORTIONS

<u>Descriptive Term</u>	<u>Percent</u>
Trace	1 – 10
Trace to Some	11 – 20
Some	21 – 35
And	36 – 50

### NOTES

**Classification** – The Unified Soil Classification System is used to identify soil unless otherwise noted.

**Standard “N” Penetration Test (SPT) (ASTM D1586)** – Driving a 2-inch O.D., 1 3/8-inch I.D. sampler a distance of 1 foot into undisturbed soil with a 140-pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6-inches to seat the sampler into undisturbed soil, and then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6 inches of penetration on the field drill log (e.g., 10/8/7). On the report log, the Standard Penetration Test result (i.e., the N value) is normally presented and consists of the sum of the 2<sup>nd</sup> and 3<sup>rd</sup> penetration counts (i.e.,  $N = 8 + 7 = 15$  blows/ft.)

### Soil Property Symbols

Qu:	Unconfined Compressive Strength	N:	Standard Penetration Value (see above)
Qp:	Unconfined Comp. Strength (pocket pent.)	omc:	Optimum Moisture content
LL:	Liquid Limit, % (Atterberg Limit)	PL:	Plastic Limit, % (Atterberg Limit)
PI:	Plasticity Index	mdd:	Maximum Dry Density



AMERICAN ENGINEERS, INC.  
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Olagow, KY 40341  
(770) 631-7720  
Fax (770) 631-3346

**B-1**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  \_\_\_\_\_ n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1055.5+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  \_\_\_\_\_ n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	SAMPLER	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes
						1	2	3	4	5						
0		OVERBURDEN														
1055																
2.5																
5																
1050																
7.5																
10																
1045																
12.5																
15																
1040																
17.5																
20																
1035																
22.5																
25		auger refusal @ 23.4 feet														
1030																
27.5																
30																
1025																
32.5																



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Olagow, KY 40341  
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**B-2**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  \_\_\_\_\_ n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1055.5+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  \_\_\_\_\_ n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes
					1	2	3	4	5						
0	1055	TOPSOIL (10 inches)													
2.5		lean CLAY- trace to some fine sand- trace fine gravel- reddish brown to tan- moist to wet- stiff	CL												
5	1050									1.46	4.5	n/a	2.0		
7.5															
10	1045									1.09	4.5+	n/a	2.0		
12.5															
15	1040									3.25	10	1.5			
17.5															
20	1035									0.25	n/a	0.7			
22.5		auger refusal @ 21.7 feet													
25	1030														
27.5															
30	1025														
32.5															

Figure



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**B-3**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  \_\_\_\_\_ n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1055+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  \_\_\_\_\_ n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes		
					1	2	3	4	5								
0	1055	OVERBURDEN		[Soil Type Diagram]	× Qu (TSF) Qp (TSF) Δ Plastic Limit ———— Liquid Limit Water Content (W%) - ● N (BPF) - □ 10 20 30 40 50												
2.5																	
5	1050																
7.5																	
10	1045																
12.5																	
15	1040																
17.5																	
20	1035																
22.5			auger refusal @ 20.6 feet														
25	1030																
27.5																	
30	1025																
32.5																	

Figure



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**B-4**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  \_\_\_\_\_ n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1055+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  \_\_\_\_\_ n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/ % REC.	N (BPF)/ RQD	REC. (FT.)	RUN (FT.)	Notes
					1	2	3	4	5						
0	1055	OVERBURDEN													
2.5															
5	1050														
7.5															
10	1045														
12.5															
15	1040														
17.5															
20	1035	auger refusal @ 20.4 feet													
22.5															
25	1030														
27.5															
30	1025														
32.5															

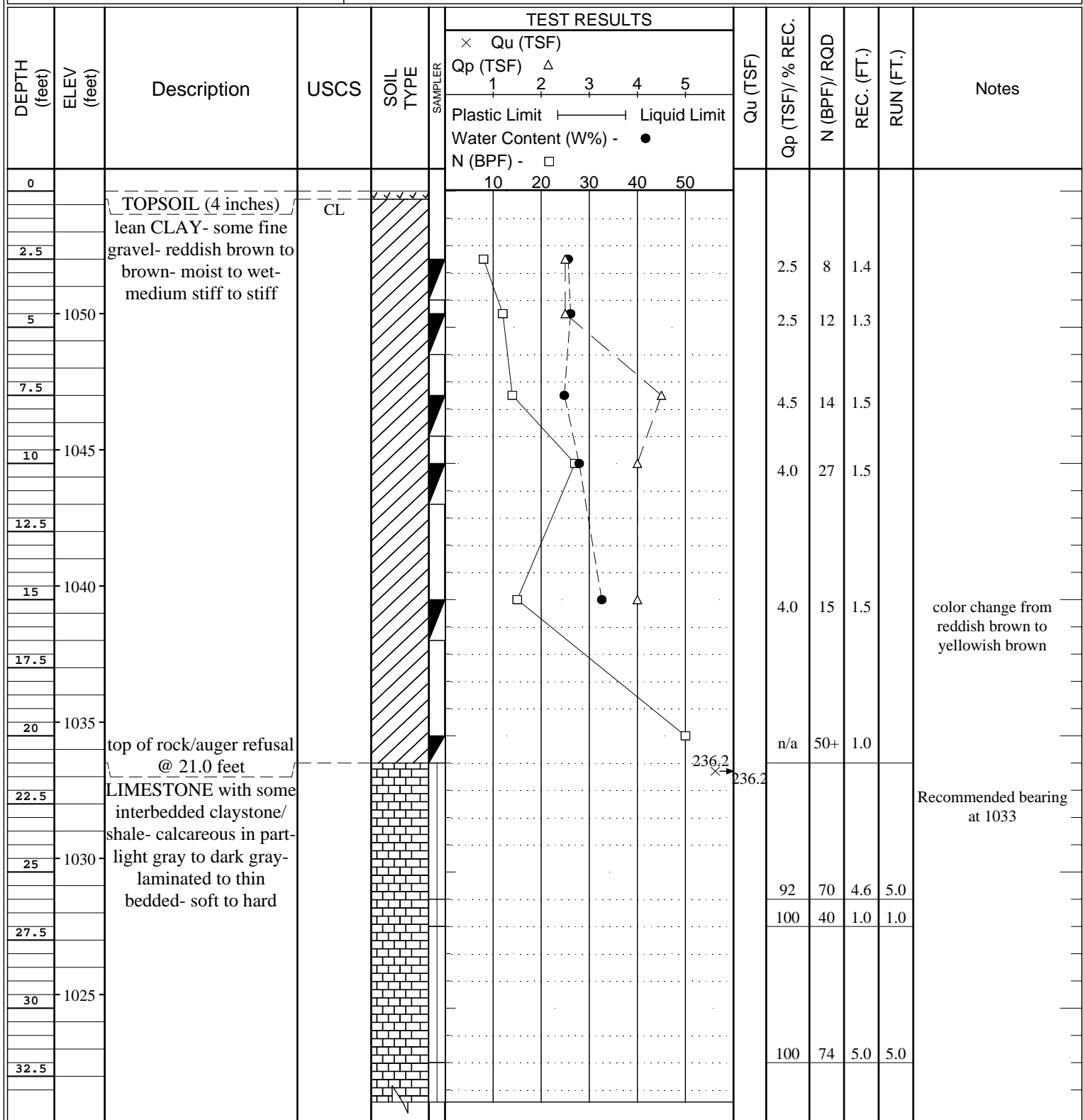


AMERICAN ENGINEERS, INC.  
67 Abbeville Drive  
Olagow, KY 40341  
(770) 631-7720  
Fax (770) 631-3246

**B-5**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  \_\_\_\_\_ n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1054.5+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  \_\_\_\_\_ n/a



Figure





AMERICAN ENGINEERS, INC.  
 65 Aberdeen Drive  
 Chicago, IL 60641  
 (773) 631-7220  
 Fax (773) 631-3246

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank

**PROJECT NO.:** 210-029

**CLIENT:** HMB, INC.

**DATE:** 3-25-10

**LOCATION:** Jessamine County, KY

**ELEVATION:** 1054.5+/-

**DRILLER:** Dusty Barrett

**LOGGED BY:** Brad High

**B-5**

**DRILLING METHOD:** hollow-stem augers

**ENGINEER:** Dennis Mitchell, PE

**DEPTH TO - WATER> INITIAL:**  $\nabla$  n/a

**AFTER 24 HOURS:**  $\nabla$  n/a

File: 210-029

Date Printed: 4/2/2010

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes
					× Qu (TSF) Qp (TSF) Δ										
					1	2	3	4	5						
					Plastic Limit ———— Liquid Limit										
					Water Content (W%) - ●										
					N (BPF) - □										
					10	20	30	40	50						
35	1020	LIMESTONE with some interbedded claystone/shale- calcareous in part- light gray to dark gray- laminated to thin bedded- soft to hard													
37.5											100	76	5.0	5.0	
40	1015										97	30	2.9	3.0	
		bottom of hole @ 40.0 feet													
42.5															
45	1010														
47.5															
50	1005														
52.5															
55	1000														
57.5															
60	995														
62.5															
990															



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**B-6**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**PROJECT NO.:** 210-029  
**CLIENT:** HMB, INC.  
**DATE:** 3-25-10  
**LOCATION:** Jessamine County, KY  
**ELEVATION:** 1054.5+/-  
**DRILLER:** Dusty Barrett  
**LOGGED BY:** Brad High  
**DRILLING METHOD:** hollow-stem augers  
**ENGINEER:** Dennis Mitchell, PE  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  n/a  
**AFTER 24 HOURS:**  $\nabla$  n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes	
					1	2	3	4	5							
0		OVERBURDEN		[Soil Type Diagram]	× Qu (TSF) Qp (TSF) Δ Plastic Limit ———— Liquid Limit Water Content (W%) - ● N (BPF) - □ 10 20 30 40 50											
2.5																
5	1050															
7.5																
10	1045															
12.5																
15	1040															
17.5																
20	1035															
22.5			auger refusal @ 21.6 feet													
25	1030															
27.5																
30	1025															
32.5																



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 67 Albrecht Drive  
 Glasgow, KY 40341  
 (770) 631-7720  
 Fax (770) 631-3346

**B-7**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank **PROJECT NO.:** 210-029  
**CLIENT:** HMB, INC. **DATE:** 3-25-10  
**LOCATION:** Jessamine County, KY **ELEVATION:** 1054+/-  
**DRILLER:** Dusty Barrett **LOGGED BY:** Brad High  
**DRILLING METHOD:** hollow-stem augers **ENGINEER:** Dennis Mitchell, PE  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  n/a **AFTER 24 HOURS:**  $\nabla$  n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes
					1	2	3	4	5						
0		OVERBURDEN													
2.5															
5	1050														
7.5															
10	1045														
12.5															
15	1040														
17.5															
20	1035														
22.5		auger refusal @ 22.0 feet													
25	1030														
27.5															
30	1025														
32.5															



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**B-8**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  \_\_\_\_\_ n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1054.5+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  \_\_\_\_\_ n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes
					1	2	3	4	5						
0		TOPSOIL (8 inches)													
2.5		lean CLAY- trace to some fine sand- trace fine gravel- brown to reddish brown- wet- stiff to very stiff	CL							1.75	n/a	1.0			
5	1050									1.49	2.25	n/a	1.2		
7.5										4.0	18	1.5			
10	1045									1.89	4.5+	n/a	1.1		
12.5															
15	1040									3.0	n/a	1.2			
17.5															
20	1035									0.25	50+	0.4			
		auger refusal @ 20.2 feet													
22.5															
25	1030														
27.5															
30	1025														
32.5															

Figure

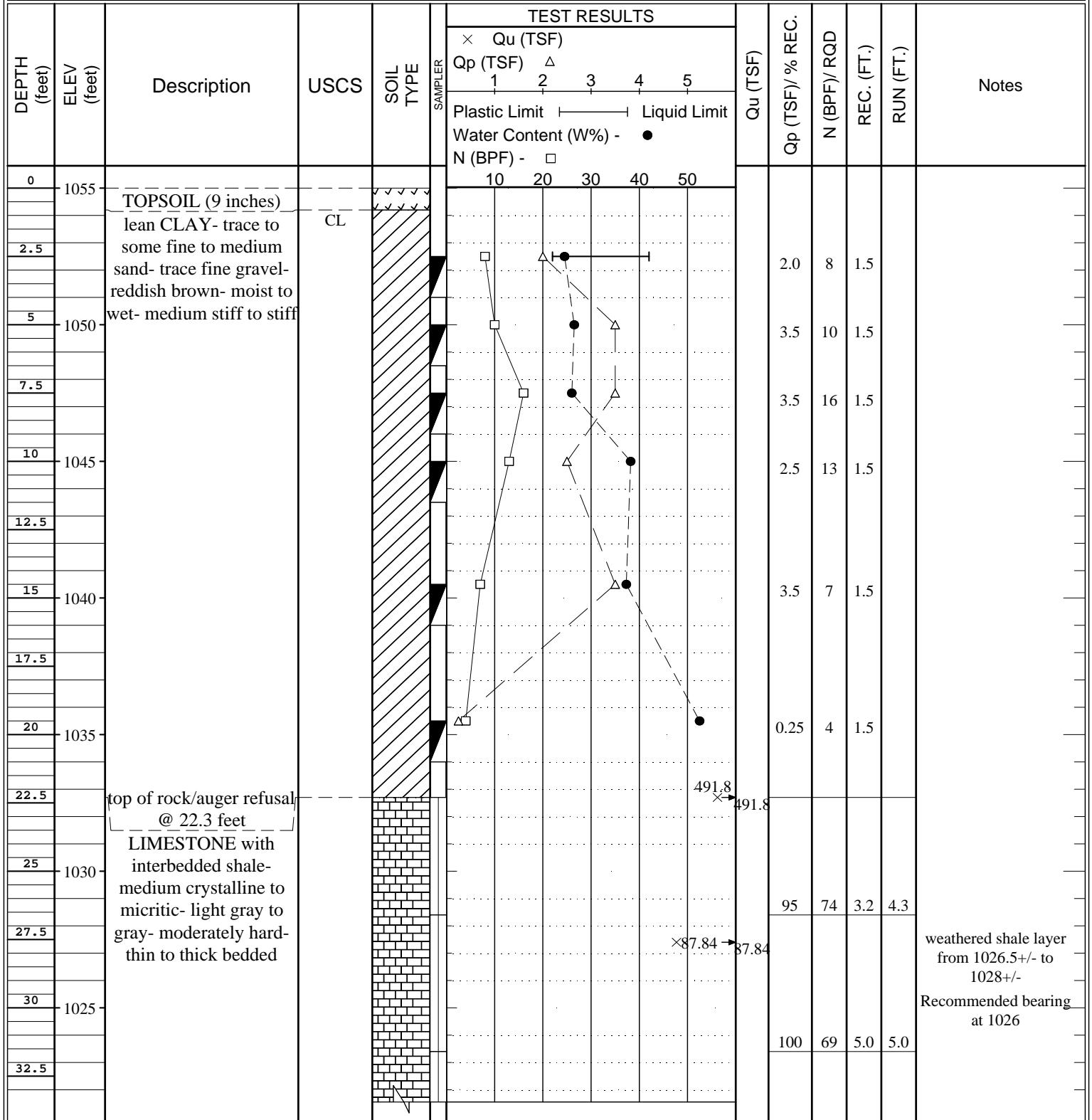


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(770) 631-7720  
Fax (770) 634-3246

**B-9**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1055+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  n/a



Figure



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 65 Aberdeen Drive  
 Chicago, IL 60641  
 (773) 631-7220  
 Fax (773) 631-3246

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank

**PROJECT NO.:** 210-029

**CLIENT:** HMB, INC.

**DATE:** 3-25-10

**LOCATION:** Jessamine County, KY

**ELEVATION:** 1055+/-

**DRILLER:** Dusty Barrett

**LOGGED BY:** Brad High

**B-9**

**DRILLING METHOD:** hollow-stem augers

**ENGINEER:** Dennis Mitchell, PE

**DEPTH TO - WATER> INITIAL:**  $\nabla$  n/a

**AFTER 24 HOURS:**  $\nabla$  n/a

File: 210-029

Date Printed: 4/2/2010

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes		
					1	2	3	4	5								
35	1020	LIMESTONE with interbedded shale-medium crystalline to micritic- light gray to gray- moderately hard-thin to thick bedded			× Qu (TSF) Qp (TSF) Δ Plastic Limit ———— Liquid Limit Water Content (W%) - ● N (BPF) - □ 10 20 30 40 50												
37.5																	
40	1015																
42.5					bottom of hole @ 41.8 feet												
45	1010																
47.5																	
50	1005																
52.5																	
55	1000																
57.5																	
60	995																
62.5																	

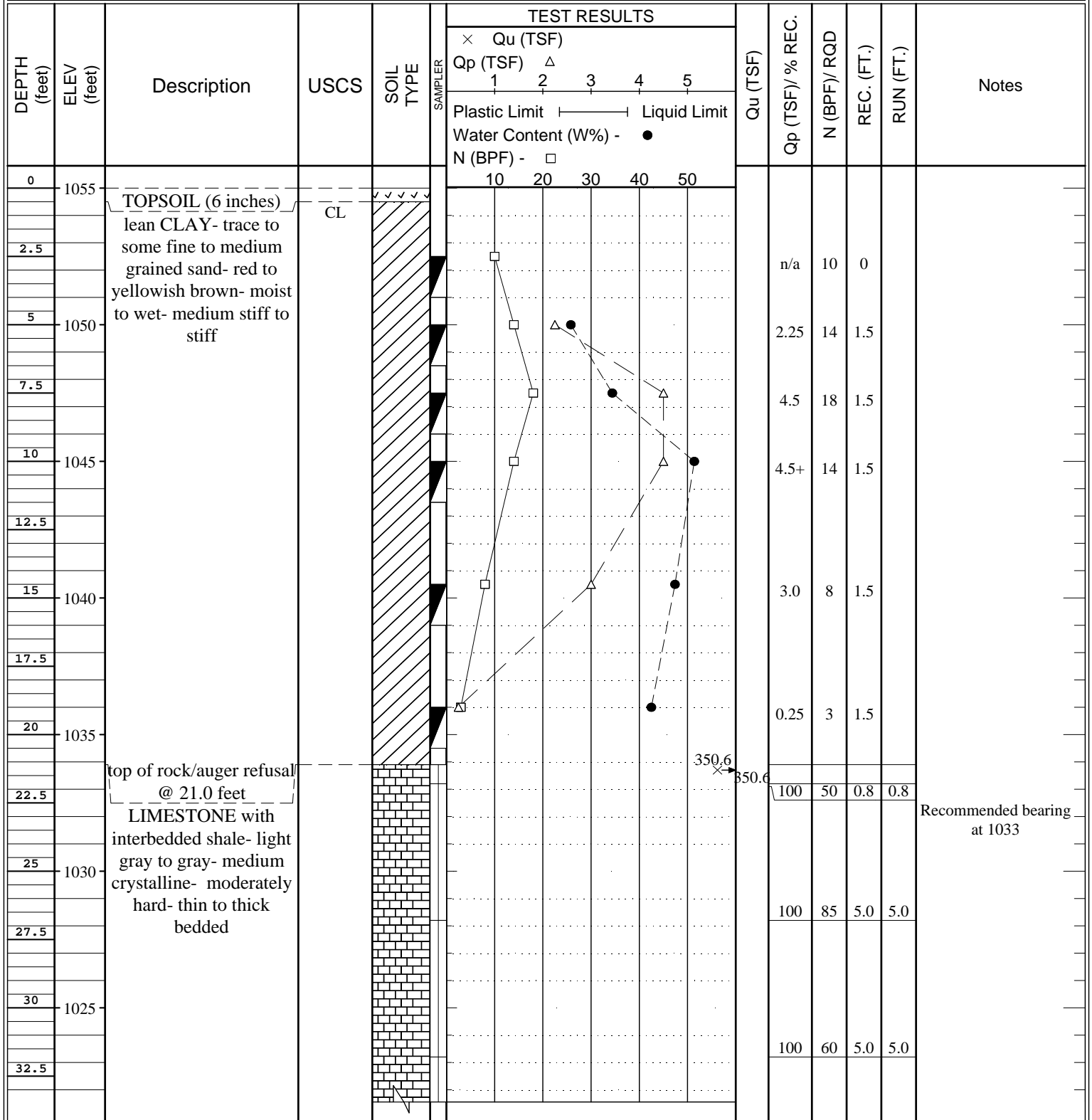


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Olagow, KY 40341  
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Fax (770) 631-3246

**B-10**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  \_\_\_\_\_ n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1055+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  \_\_\_\_\_ n/a



Figure



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 Chicago, IL 60641  
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 Fax (773) 631-3246

PROJECT: Jessamine Co., Brannon Rd. Elevated Tank

PROJECT NO.: 210-029

CLIENT: HMB, INC.

DATE: 3-25-10

LOCATION: Jessamine County, KY

ELEVATION: 1055+/-

DRILLER: Dusty Barrett

LOGGED BY: Brad High

**B-10**

DRILLING METHOD: hollow-stem augers

ENGINEER: Dennis Mitchell, PE

DEPTH TO - WATER> INITIAL: ☹ n/a

AFTER 24 HOURS: ☹ n/a

File: 210-029

Date Printed: 4/2/2010

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes	
					1	2	3	4	5							
35	1020	LIMESTONE with interbedded shale- light gray to gray- medium crystalline- moderately hard- thin to thick bedded			× Qu (TSF) Qp (TSF) Δ Plastic Limit ———— Liquid Limit Water Content (W%) - ● N (BPF) - □ 10 20 30 40 50											
37.5												100	84	5.0	5.0	
40	1015	bottom of hole @ 40.8 feet														
42.5												98	45	3.9	4.0	
45	1010															
47.5																
50	1005															
52.5																
55	1000															
57.5																
60	995															
62.5																





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B-11

PROJECT: Jessamine Co., Brannon Rd. Elevated Tank

PROJECT NO.: 210-029

CLIENT: HMB, INC.

DATE: 3-25-10

LOCATION: Jessamine County, KY

ELEVATION: 1054.5+/-

DRILLER: Dusty Barrett

LOGGED BY: Brad High

DRILLING METHOD: hollow-stem augers

ENGINEER: Dennis Mitchell, PE

DEPTH TO - WATER> INITIAL:  $\nabla$  n/a

AFTER 24 HOURS:  $\nabla$  n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes	
					1	2	3	4	5							
0		TOPSOIL (12 inches)														
2.5		lean CLAY- trace to some fine to medium grained sand- trace fine gravel- reddish brown- moist to wet- medium stiff to stiff	CL	[Soil Type Pattern]												
5	1050										1.75	9	1.0			
7.5												3.0	10	1.5		
10	1045											4.5+	17	1.4		
12.5		bottom of hole/ boring terminated @ 11.0 feet														
15	1040															
17.5																
20	1035															
22.5																
25	1030															
27.5																
30	1025															
32.5																



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**B-12**

**PROJECT:** Jessamine Co., Brannon Rd. Elevated Tank  
**CLIENT:** HMB, INC.  
**LOCATION:** Jessamine County, KY  
**DRILLER:** Dusty Barrett  
**DRILLING METHOD:** hollow-stem augers  
**DEPTH TO - WATER> INITIAL:**  $\nabla$  \_\_\_\_\_ n/a

**PROJECT NO.:** 210-029  
**DATE:** 3-25-10  
**ELEVATION:** 1056.5+/-  
**LOGGED BY:** Brad High  
**ENGINEER:** Dennis Mitchell, PE  
**AFTER 24 HOURS:**  $\nabla$  \_\_\_\_\_ n/a

DEPTH (feet)	ELEV (feet)	Description	USCS	SOIL TYPE	TEST RESULTS					Qu (TSF)	Qp (TSF)/% REC.	N (BPF)/RQD	REC. (FT.)	RUN (FT.)	Notes
					1	2	3	4	5						
0		TOPSOIL (12 inches)													
1055		lean CLAY- trace to some fine sand- trace fine gravel- brown to reddish brown- moist to wet- soft to stiff	CL												
2.5										0.75	4	1.2			
5										3.0	8	1.5			
1050										3.25	8	1.5			
7.5										2.0	7	1.5			
10															
1045		bottom of hole/ boring terminated @ 11.0 feet													
12.5															
15															
1040															
17.5															
20															
1035															
22.5															
25															
1030															
27.5															
30															
1025															
32.5															

Figure

# KEY TO SYMBOLS

Symbol Description

## Strata symbols



Overburden



Topsoil



Low plasticity  
clay



Limestone

## Misc. Symbols



N Value (N BPF)



water content



pocket penetrometer (Qp, TSF)



Unconfined Compression Test (Qu  
TSF)



Boring continues

## Soil Samplers



Undisturbed thin wall  
Shelby Tube



Standard penetration test



Rock core

## Notes:

1. Exploratory borings were drilled using a truck-mounted drill rig equipped with hollow stem augers.
2. Boring locations were determined in the field by AEI Field Services Center personnel.
- 3 . These logs are subject to the limitations, conclusions, and recommendations.

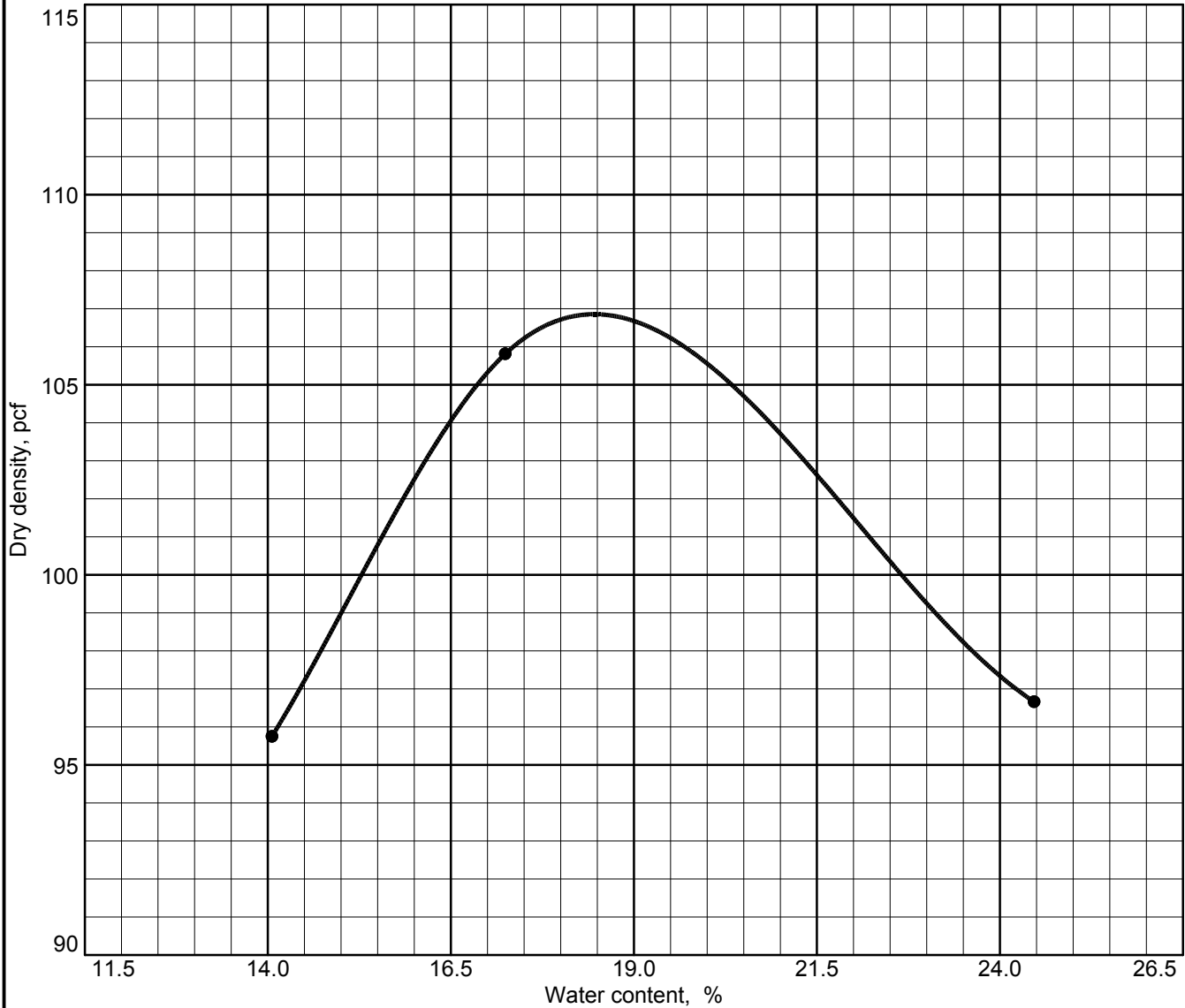
# **Appendix C**

## **Laboratory Testing Results**





# COMPACTION TEST REPORT



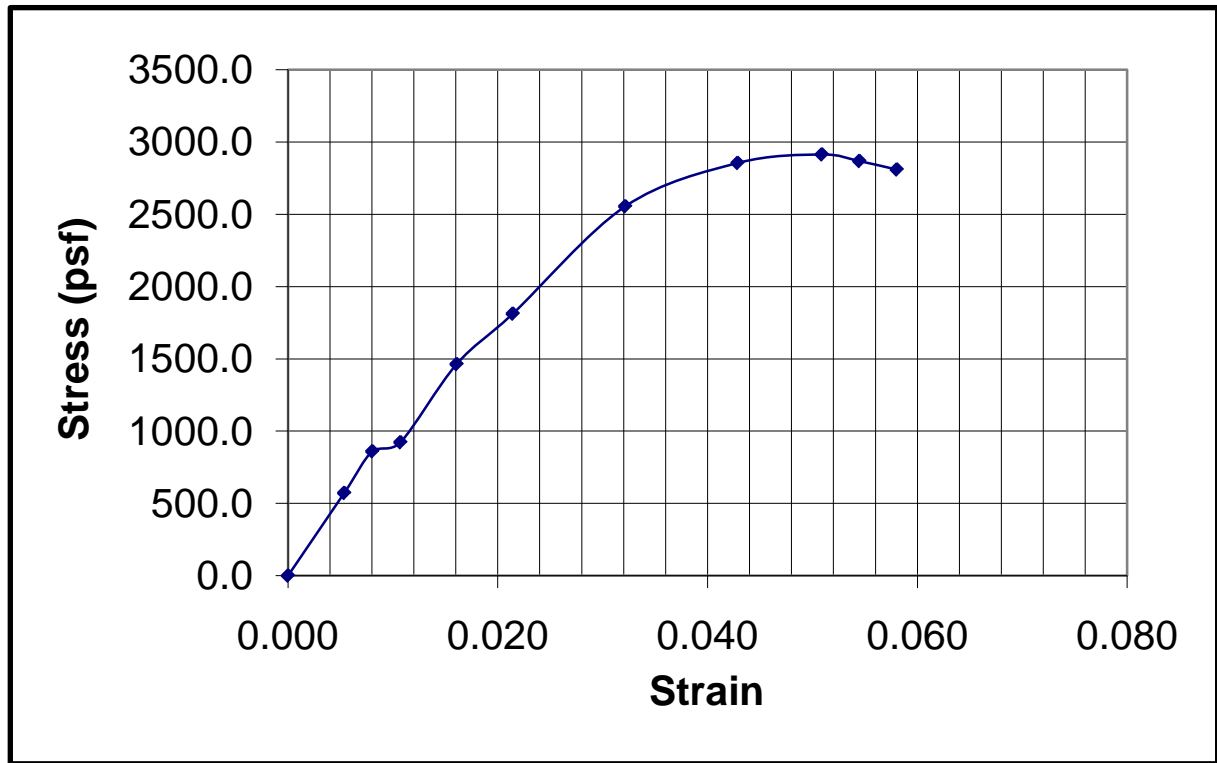
Test specification: ASTM D 698-00a Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
3'-6'								

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106.9 pcf Optimum moisture = 18.5 %	lean CLAY- trace to some fine to medium grained sand- trace fine gravel- reddish brown- moist to wet- medium stiff to stiff
<b>Project No.</b> 210-029 <b>Client:</b> HMB, INC. <b>Project:</b> Jessamine Co., Brannon Rd. Elevated Tank  ● <b>Location:</b> B-11	<b>Remarks:</b>   <div style="text-align: right; margin-top: 20px;">Figure</div>
<b>American Engineers, Inc.</b> <b>Field Services Center</b> <b>Glasgow, Kentucky</b>	

# Unconfined Compression Test

Client HMB, Inc. Project No. 210-029 Date 3/31/2010  
 Location Jessamine County, KY  
 Boring No. B-2 Sample No. 0 Depth 4.5'-6.5'  
 Sample Type undisturbed  
 Sample Description reddish brown lean clay



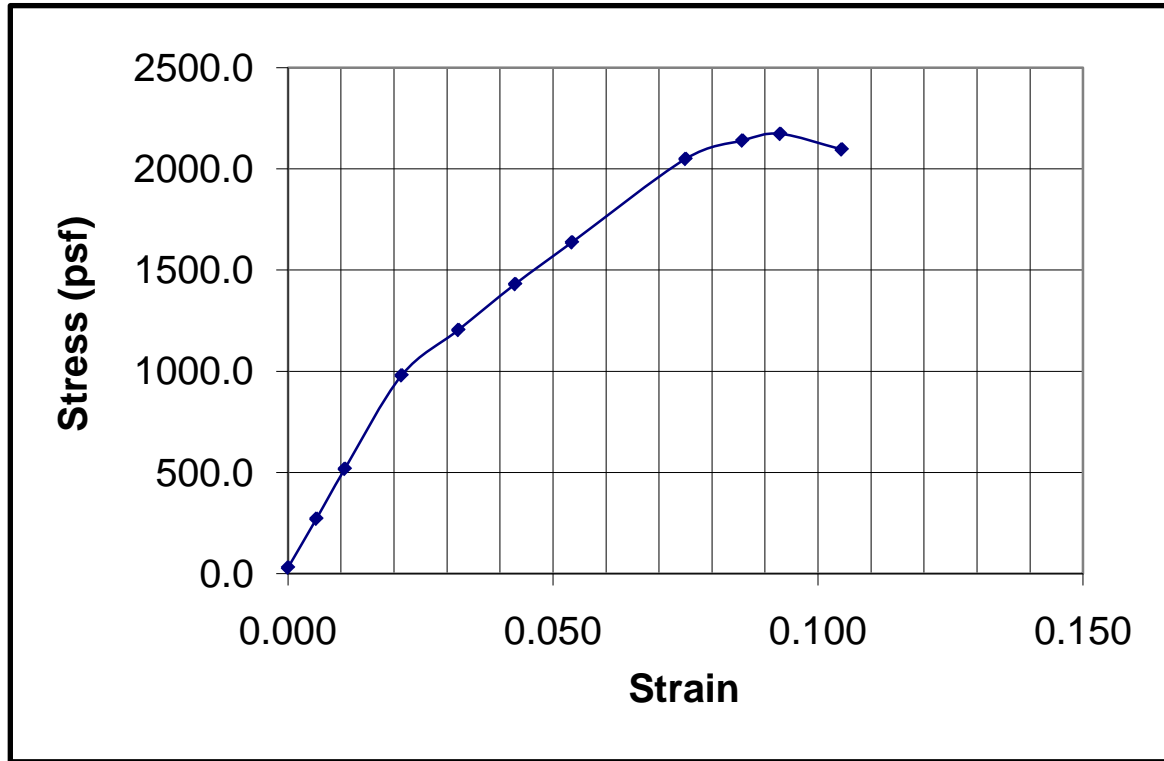
Strain Dial	Strain	Load Dial	Axial Load (lb.)	Stress (psi)	Stress (psf)
0	0.000	0	1.233	0.000	0.000
30	0.005	75	25.365	3.971	571.774
45	0.008	115	38.235	5.969	859.571
60	0.011	124	41.130	6.404	922.175
90	0.016	200	65.583	10.156	1462.467
120	0.021	250	81.671	12.578	1811.292
180	0.032	358	116.420	17.734	2553.684
240	0.043	405	131.542	19.816	2853.451
285	0.051	417	135.403	20.226	2912.545
305	0.054	412	133.795	19.910	2867.111
325	0.058	405	131.542	19.501	2808.200

Qu 2912.5 psf  
 Wet Density 123.3 pcf  
 Dry Density 97.6 pcf  
 Percent Moisture 26.2 %



# Unconfined Compression Test

Client HMB, Inc. Project No. 210-029 Date 3/31/2010  
 Location Jessamine County, KY  
 Boring No. B-2 Sample No. 0 Depth 10'-12'  
 Sample Type undisturbed  
 Sample Description reddish brown lean clay

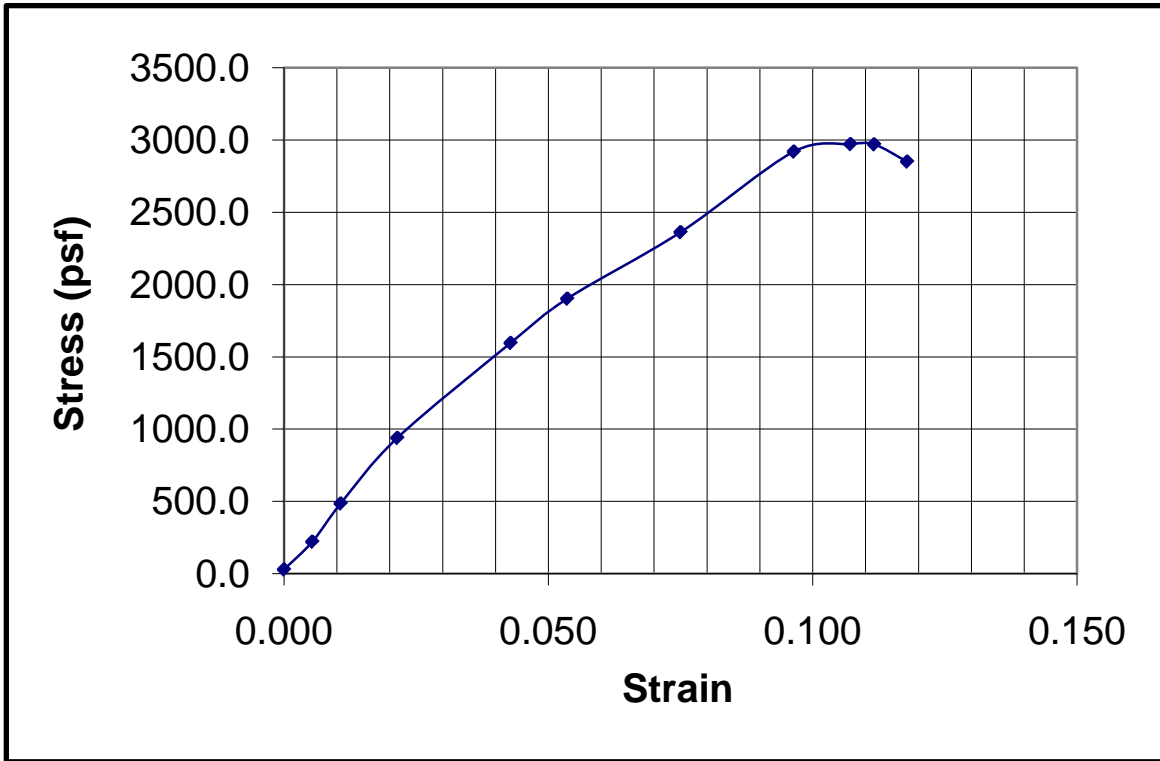


Strain Dial	Strain	Load Dial	Axial Load (lb.)	Stress (psi)	Stress (psf)
0	0.000	0	1.233	0.209	30.026
30	0.005	31	11.208	1.885	271.387
60	0.011	63	21.504	3.596	517.895
120	0.021	124	41.130	6.805	979.859
180	0.032	155	51.105	8.362	1204.148
240	0.043	187	61.401	9.936	1430.731
300	0.054	217	71.053	11.369	1637.117
420	0.075	279	91.002	14.231	2049.271
480	0.086	295	96.150	14.862	2140.120
520	0.093	302	98.402	15.091	2173.140
585	0.104	295	96.150	14.557	2096.231

Qu 2173.1 psf  
 Wet Density 110.9 pcf  
 Dry Density 82.0 pcf  
 Percent Moisture 35.3 %

# Unconfined Compression Test

Client HMB, Inc. Project No. 210-029 Date 3/31/2010  
 Location Jessamine County, KY  
 Boring No. B-8 Sample No. 0 Depth 5'-7'  
 Sample Type undisturbed  
 Sample Description reddish brown lean clay

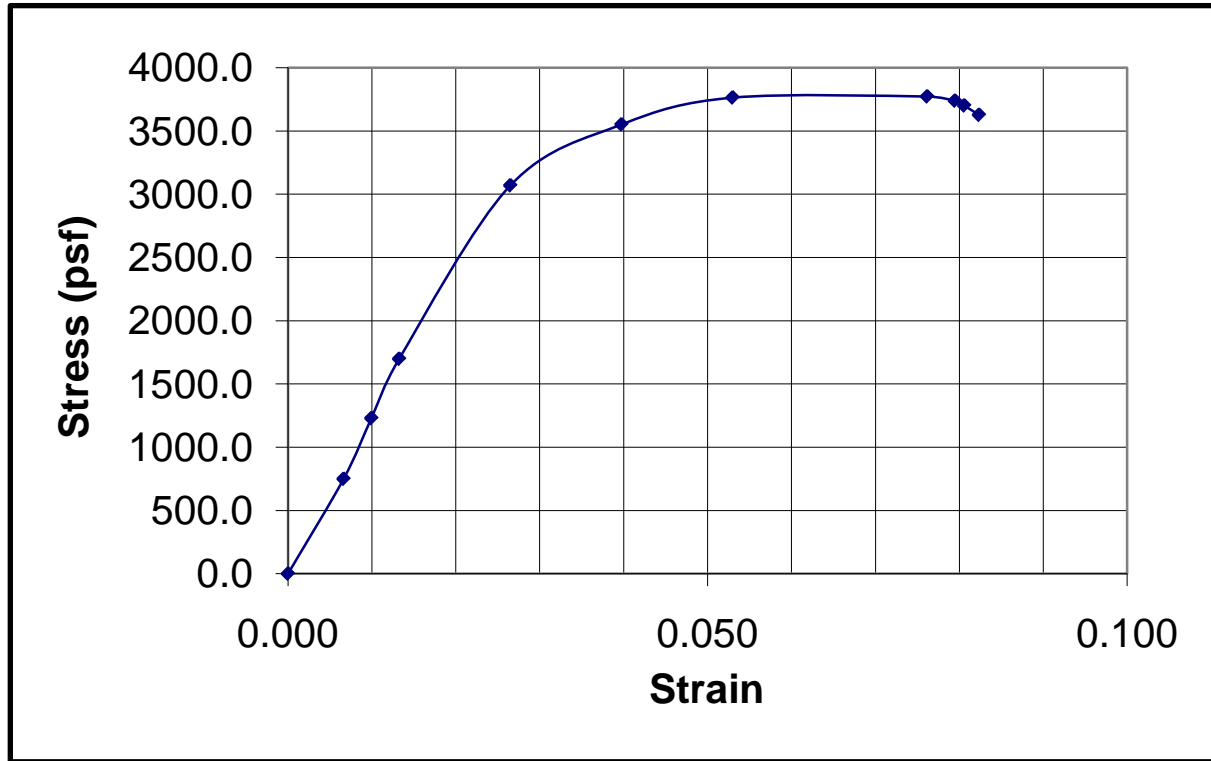


Strain Dial	Strain	Load Dial	Axial Load (lb.)	Stress (psi)	Stress (psf)
0	0.000	0	1.233	0.198	28.552
30	0.005	26	9.599	1.535	221.016
60	0.011	62	21.182	3.369	485.090
120	0.021	125	41.452	6.521	939.022
240	0.043	220	72.018	11.081	1595.719
300	0.054	266	86.819	13.209	1902.122
420	0.075	339	110.307	16.403	2361.999
540	0.096	430	139.586	20.276	2919.715
600	0.107	443	143.769	20.636	2971.547
625	0.112	445	144.412	20.624	2969.923
660	0.118	430	139.586	19.795	2850.473

Qu 2971.5 psf  
 Wet Density 119.1 pcf  
 Dry Density 94.9 pcf  
 Percent Moisture 25.5 %

# Unconfined Compression Test

Client HMB, Inc. Project No. 210-029 Date 3/31/2010  
 Location Jessamine County, KY  
 Boring No. B-8 Sample No. 0 Depth 10'-12'  
 Sample Type undisturbed  
 Sample Description reddish brown to tannish brown lean clay



Strain Dial	Strain	Load Dial	Axial Load (lb.)	Stress (psi)	Stress (psf)
0	0.000	0	1.233	0.000	0.000
30	0.007	100	33.408	5.205	749.503
45	0.010	167	54.966	8.535	1229.020
60	0.013	233	76.201	11.793	1698.143
120	0.026	430	139.586	21.312	3068.919
180	0.040	505	163.717	24.656	3550.493
240	0.053	543	175.944	26.132	3763.017
345	0.076	558	180.770	26.192	3771.611
360	0.079	555	179.805	25.959	3738.026
365	0.081	550	178.196	25.695	3700.139
373	0.082	540	174.979	25.183	3626.350

Qu 3771.6 psf  
 Wet Density 136.3 pcf  
 Dry Density 104.3 pcf  
 Percent Moisture 30.8 %

# Your Geotechnical Engineering Report

To help manage your risks, this information is being provided because subsurface issues are a major cause of construction delays, cost overruns, disputes, and claims.

## Geotechnical Services are Performed for Specific Projects, Purposes, and People

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering exploration conducted for an engineer may not fulfill the needs of a contractor or even another engineer. Each geotechnical engineering exploration and report is unique and is prepared solely for the client. No one except the client should rely on the geotechnical engineering report without first consulting with the geotechnical engineer who prepared it. The report should not be applied for any project or purpose except the one originally intended.

## Read the Entire Report

To avoid serious problems, the full geotechnical engineering report should be read in its entirety. Do not only read selected sections or the executive summary.

## A Unique Set of Project-Specific Factors is the Basis for a Geotechnical Engineering Report

Geotechnical engineers consider a numerous unique, project-specific factors when determining the scope of a study. Typical factors include: the client's goals, objectives, project costs, risk management preferences, proposed structures, structures on site, topography, and other proposed or existing site improvements, such as access roads, parking lots, and utilities. Unless indicated otherwise by the geotechnical engineer who conducted the original exploration, a geotechnical engineering report should not be relied upon if it was:

- not prepared for you or your project,
- not prepared for the specific site explored, or
- completed before important changes to the project were implemented.

Typical changes that can lessen the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a multi-story hotel to a parking lot
- finished floor elevation, location, orientation, or weight of the proposed structure, anticipated loads or
- project ownership

Geotechnical engineers cannot be held liable or

responsible for issues that occur because their report did not take into account development items of which they were not informed. The geotechnical engineer should always be notified of any project changes. Upon notification, it should be requested of the geotechnical engineer to give an assessment of the impact of the project changes.

## Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that exist at the time of the exploration. A geotechnical engineering report should not be relied upon if its reliability could be in question due to factors such as man-made events as construction on or adjacent to the site, natural events such as floods, earthquakes, or groundwater fluctuation, or time. To determine if a geotechnical report is still reliable, contact the geotechnical engineer. Major problems could be avoided by performing a minimal amount of additional analysis and/or testing.

## Most Geotechnical Findings are Professional Opinions

Geotechnical site explorations identify subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field logs and laboratory data and apply their professional judgment to make conclusions about the subsurface conditions throughout the site. Actual subsurface conditions may differ from those indicated in the report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risk associated with unanticipated conditions.

## The Recommendations within a Report Are Not Final

Do not put too much faith on the construction recommendations included in the report. The recommendations are not final due to geotechnical engineers developing them principally from judgment and opinion. Only by observing actual subsurface conditions revealed during construction can geotechnical engineers finalize their recommendations. Responsibility and liability cannot be assumed for the recommendations

within the report by the geotechnical engineer who developed the report if that engineer does not perform construction observation.

### **A Geotechnical Engineering Report Is Subject To Misinterpretation**

Misinterpretation of geotechnical engineering reports has resulted in costly problems. The risk of misinterpretation can be lowered after the submittal of the final report by having the geotechnical engineer consult with appropriate members of the design team. The geotechnical engineer could also be retained to review crucial parts of the plans and specifications put together by the design team. The geotechnical engineering report can also be misinterpreted by contractors which can result in many problems. By participating in pre-bid and preconstruction meetings and providing construction observations by the geotechnical engineer, many risks can be reduced.

### **Final Boring Logs Should not be Re-drawn**

Geotechnical engineers prepare final boring logs and testing results based on field logs and laboratory data. The logs included in a final geotechnical engineering report should never be redrawn to be included in architectural or design drawings due to errors that could be made. Electronic reproduction is acceptable, along with photographic reproduction, but it should be understood that separating logs from the report can elevate risk.

### **Contractors Need a Complete Report and Guidance**

By limiting what is provided for bid preparation, contractors are not liable for unforeseen subsurface conditions although some owners and design professionals believe the opposite to be true. The complete geotechnical engineering report, accompanied with a cover letter or transmittal, should be provided to contractors to help prevent costly problems. The letter states that the report was not prepared for purposes of bid

development and the report's accuracy is limited. Although a fee may be required, encourage the contractors to consult with the geotechnical engineer who prepared the report and/or to conduct additional studies to obtain the specific types of information they need or prefer. A prebid conference involving the owner, geotechnical engineer, and contractors can prove to be very valuable. If needed, allow contractors sufficient time to perform additional studies. Upon doing this you might be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

### **Closely Read Responsibility Provisions**

Geotechnical engineering is not as exact as other engineering disciplines. This lack of understanding by clients, design professionals, and contractors has created unrealistic expectations that have led to disappointments, claims, and disputes. To minimize such risks, a variety of explanatory provisions may be included in the report by the geotechnical engineer. To help others recognize their own responsibilities and risks, many of these provisions indicate where the geotechnical engineer's responsibilities begin and end. These provisions should be read carefully, questions asked if needed, and the geotechnical engineer should provide satisfactory responses.

### **Environmental Issues/Concerns are not Covered**

Unforeseen environmental issues can lead to project delays or even failures. Geotechnical engineering reports do not usually include environmental findings, conclusions, or recommendations. As with a geotechnical engineering report, do not rely on an environmental report that was prepared for someone else.



**AMERICAN ENGINEERS, INC.**  
PROFESSIONAL ENGINEERING

65 Aberdeen Drive  
Glasgow, KY 42141  
270-651-7220



## **APPENDIX 5**

### **STREAM/FLOODPLAIN PERMIT WATER QUALITY CERTIFICATION**





**From:** [Fry, Joyce \(EEC\)](#)  
**To:** [carl.waits@twc.com](mailto:carl.waits@twc.com)  
**Cc:** [castewart@hmbpe.com](mailto:castewart@hmbpe.com); [Allen, Kathy \(EEC\)](#)  
**Subject:** Application for Construction Across or Along a Stream and/or WQC received AI# 33935  
**Date:** Thursday, August 28, 2014 4:54:48 PM

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Mr. Waits, we are in receipt of the application submitted for a 1.0 Million Gallon Elevated Water Storage Tank, 600 GPM Booster Pump Station, Control Valve & Vault and all necessary piping and appurtenances; however, as the project will not be located in the floodplain and there will not be any stream or wetland impacts, neither a Stream Construction Permit nor a Water Quality Certification will be required. We will have the document scanned into our database, but will not process it for the permit and certification. Thank you.

### **Joyce Fry**

Environmental Biologist Consultant

200 Fair Oaks Lane

Frankfort, KY 40601

Water Quality Certification Section

Kentucky Division of Water

Office (502) 564-3410 ext 4878

Cell (502) 226-0738

Fax 502-564-9899

<http://water.ky.gov/permitting/Pages/KYWaterQualityCertProg.aspx>

**The Worst Stuff (consequences of global climate change) is not going to happen because we can't be that stupid.** *James McCarthy, lead author of the 2001 intergovernmental Panel on Climate Change report.*



## **APPENDIX 6**

### **HIGHWAY PERMITS**





## TRANSPORTATION CABINET

Department of Highways District 7 Office  
P.O. Box 11127  
Lexington, KY 40512-1127  
(859) 246-2355

**Steven L. Beshear**  
Governor

**Michael W. Hancock, P.E.**  
Secretary

Carl Waits  
Jessamine Co. Water District #1  
2225 Lexington Road  
Nicholasville, Kentucky 40356

Subject: Jessamine County MP 057-0027-014.767  
US 0027 (Lexington Road)  
Jessamine Co. Water District #1  
Utility(APP NO 07-2014-00313)

Dear Applicant:

Attached is your application for a permit that has been approved by the Department of Highways.

Please see that work is done in conformity with permit and applicable conditions. If you have any questions, please contact Ricky Sizemore, Permit Engineer, at (859) 246-2355.

Sincerely,

8/14/14  
Date

Kelly A. Baker, P.E.  
Branch Manager Engineering Support

KAB/mb  
Attachments



An Equal Opportunity Employer M/F/D



Kentucky Transportation Cabinet  
 Department of Highways  
 Permits Branch

TC 99-1 (A)  
 8/2012  
 Page 1 of 4

APPLICATION FOR ENCROACHMENT PERMIT

<b>Permittee Information</b>		<b>KYTC No.</b> 07-2014-00312	
Name Jessamine County Water District No.1		<b>Permit Information</b>	
Address 2225 Lexington Road		Address	
City Nicholasville		City Nicholasville	
State KY Zip 40356		State KY Zip 40356	
Phone# 859-885-9314		County Jessamine	
Contact Mr. Carl Waits, Chairman		Route No. 27 Mile-Point 14.767	
Phone 859-948-5527 Cell		Longitude (X) 84°32'19.51"W	
Email carl.waits@insightbb.com		Latitude (Y) 37°57'22.47"N	
Contact CHRIS STEWART		<i>Information below to be filled out by KYTC</i>	
Phone 502-695-9800 Cell		<input type="checkbox"/> Air Right <input type="checkbox"/> Entrance	
Email castewart@hmbpe.com		<input checked="" type="checkbox"/> Utilities <input type="checkbox"/> Other: <u>underground</u>	
		<input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input type="checkbox"/> X-ing	
		Access: <input type="checkbox"/> Full <input type="checkbox"/> Partial <input checked="" type="checkbox"/> by Permit	

General Description of Work:

JCWD No.1 proposes to make a connection between two existing lines. The existing 12-inch and 6-inch water lines will be connected using wet tap and valves along with 6-inch water line and all necessary fittings.

RECEIVED  
 JUL 29 2014  
 DEPARTMENT OF HIGHWAYS  
 DISTRICT 7  
 LEXINGTON

THE UNDERSIGNED PERMITTEE(S) (being duly authorized representative(s) or owner(s)) DO AGREE TO ALL TERMS AND CONDITIONS ON THE TC 99-1 (A).

*Carl Waits*

7-23-2014

Signature

Date

This is not a permit unless and until the permittee(s) receives an approved TC 99-1(B) from KYTC. This application will become void if not approved by the cancellation date. The cancellation date will be one year from the date the permittee submits their application.



## APPLICATION FOR ENCROACHMENT PERMIT

### TERMS AND CONDITIONS

1. The permit, including this application and all related and accompanying documents and drawings making up the permit, remains in effect and is binding upon the Applicant/Permittee, its successors and assigns, as long as the encroachment(s) exists and also until the permittee is finally relieved by the Department of Highways from all its obligations.
2. Applicant shall meet all requirements of the Clean Water Act if the project will disturb one acre or more, the applicant shall obtain a KPDES KYR10 Permit from the Kentucky Division of Water. All disturbed areas shall meet the requirements of the Department of Highway's Standard Specifications, Sections 212 and 213, as amended.
3. **INDEMNITY:**
  - A. **PERFORMANCE BOND:** The permittee shall provide to the Department a performance bond according to the Permits Manual, Section PE-203 as a guarantee of conformance with the Department's Encroachment Permit requirements.
  - B. **PAYMENT BOND:** At the discretion of the department, a payment bond will be required of the permittee to ensure payment of liquidated damages assessed to the permittee.
  - C. **LIABILITY INSURANCE:** Liability insurance will be required of the permittee (in an amount approved by the department) to cover all liabilities associated with the encroachment.
  - D. It shall be the responsibility of the permittee, its successors and assigns, to maintain all indemnities in full force and effect until the permittee is authorized to release the indemnity by the Department.
4. A copy of this application and all related documents making up the approved permit will be given to the applicant and shall be made readily available for review at the work site at all times.
5. Perpetual maintenance of the encroachment is the responsibility of the permittee, its successors and assigns, with the approval of the Department as required, unless otherwise stated.
6. Permittee, its successors and assigns, shall comply with and agrees to be bound by the requirements and terms of (a) this application and all related documents making up the approved permit, (b) by the Department's Permits Manual, and (c) by the Manual on Uniform Traffic Control Devices, both manuals as revised to and in effect on the date of issuance of the permit, all of which documents are made a part thereof by this reference. Compliance by the permittee, its successors and assigns, with subsequent revisions to applicable provisions of either manual or other policy of the Department may be made a condition of allowing the encroachment to persist under the permit.
7. Permittee agrees that this and any encroachment may be ordered removed by the Department at any time, and for any reason, upon thirty days written notice to the last known address of the applicant or to the address at the location of the encroachment. The permittee agrees that the cost of removing and of restoring the associated right-of-way is the responsibility of the permittee, its successors and assigns.
8. Permittee, its successors and assigns, agree that if the Department determines that motor vehicular safety deficiencies develop as a result of the installation or use of the encroachment, the permittee, its successors and assigns, shall provide and bear the expenses to adjust, relocate, or reconstruct the facilities, and/or add signs, auxiliary lanes, or other corrective measures reasonably deemed necessary by the Department within a reasonable time after receipt of a written notice of such deficiency. The period within which such adjustments, relocations, additions, modifications, and/or other corrective measures must be completed will be specified in the notice.



**APPLICATION FOR ENCROACHMENT PERMIT**

9. Where traffic signals are required as a condition of granting the requested permit or are thereafter required to correct motor vehicular safety deficiencies, as determined by the Department, the costs for signal equipment and installation(s) shall be borne by the permittee, its successors and assigns, and/or the Department in its reasonable discretion and only in accordance with the Department's current policy set forth in the Traffic Operations Manual and Permits Manual. Any modifications to the permittee's entrance necessary to accommodate signalization (including necessary easement(s) on private property) shall be the responsibility of the permittee, its successors and assigns, at no expense to the Department.

10. The requested encroachment shall not infringe on the frontage rights of an abutting owner without their written consent as hereinafter described. Each abutting owner shall express their consent, which shall be binding on their successors and assigns, by the submission of a notarized statement as follows, "I (we), \_\_\_\_\_, hereby consent to the granting of the permit requested by the applicant along Route \_\_\_\_\_, which permit does affect frontage rights along my (our) adjacent real property." By signature(s) \_\_\_\_\_, subscribed and sworn by \_\_\_\_\_, on this date \_\_\_\_\_.

11. The permit, if approved, is subject to the agreement that it shall not interfere with any similar rights or permit(s) previously granted to any other party, except as otherwise provided by law.

12. Permittee shall include documentation which describes the facilities to be constructed. Permittee, its successors and assigns, agrees as a condition of the granting of the permit to construct and maintain any and all permitted facilities or other encroachments in strict accordance with the submitted and approved permit documentation and the policies and procedures of the Department. Permittee, its successors and assigns, shall not use facilities authorized herein in any manner contrary to that prescribed by the approved permit. Only normal usage as contemplated by the parties and by this application and routine maintenance are authorized by the permit.

13. Permittee, its successors and assigns, at all times from the date permitted work is commenced until such time as all permitted facilities or other encroachments are removed from the right-of-way and the right-of-way restored, shall defend, protect, indemnify and save harmless the Department from any and all liability claims and demands arising out of the work, encroachment, maintenance, or other undertaking by the permittee, its successors and assigns, related or undertaken pursuant to the granted permit, due to any claimed act or omission by the permittee, its servants, agents, employees, or contractors. This provision shall not inure to the benefit of any third party nor operate to enlarge any liability of the Department beyond that existing at common law or otherwise if this right to indemnity did not exist.

14. Upon a violation of any provision of the permit, or otherwise in its reasonable discretion, the Department may require additional action by the permittee, its successors and assigns, up to and including the removal of the encroachment and restoration of the right-of-way. In the event additional actions required by the Department under the permit are not undertaken as ordered and within a reasonable time, the Department may in its discretion cause those or other additional corrective actions to be undertaken and the Department may and shall recover the reasonable costs of those corrective actions from the permittee, its successors and assigns.

15. Permittee, its successors and assigns, shall use the encroachment premises in compliance with all requirements of federal law and regulation, including those imposed pursuant to Title VI of the Civil Right Act of 1964 (42 U.S.C. § 2000d et seq.) and the related regulations of the U.S. Department of Transportation in Title 49 C.F.R. Part 21, all as amended.





### APPLICATION FOR ENCROACHMENT PERMIT

16. Permittee, its successors and assigns, agree that if the Department determines it is necessary for the facilities or other encroachment authorized by the permit to be removed, relocated or reconstructed in connection with the reconstruction, relocation or improvement of a highway, the Department may revoke permission for the encroachment to remain under the permit and may order its removal, relocation or reconstruction by the permittee, its successors and assigns, at the expense of the permittee, except where the Department is required by law to pay any or all of those costs.

17. Permittee agrees that the authorized permit is personal to the permittee and shall remain in effect until such time as (a) the permittee's rights to the adjoining real property to have benefitted from the requested encroachment have been relinquished, (b) until all permit obligations have been assumed by appropriate successors and assigns, and (c) unless and until a written release from permit obligations has been granted by the Department. The permit and its requirements shall also bind the real property to have benefitted from the requested encroachment to the extent permitted by law. The permit and the related encroachment become the responsibility of the successors and assigns of the permittee and the successors and assigns of each property owner benefitting from the encroachment, or the encroachment may not otherwise permissibly continue to be maintained on the right-of-way. (Does not apply to utility encroachments serving the general public.)

18. If work authorized by the permit is within a highway construction project in the construction phase, it shall be the responsibility of the permittee to make personal contact with the Department's Engineer on the project in order to coordinate all permitted work with the Department's prime contractor on the project.

19. This permit is not intended to, nor shall it, affect, alter or alleviate any requirement imposed upon the permittee, its successors and assigns, by any other agency.

20. Permittee, its successors and assigns, agrees to contain and maintain all dirt, mud, and other debris emanating from the encroachment away from the surrounding right-of-way and the travel way of the highway hereafter and at all times that its obligations under the permit remain in effect.



Kentucky Transportation Cabinet  
 Department of Highways  
 Permits Branch

TC 99-1 (B)  
 1/2012  
 Page 1 of 1

**ENCROACHMENT PERMIT**

**KEPTS No.:** A07-2014-00313

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**Permittee:** Jessamine County Water District #1

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**Latitude:** 37.956343

---

**Longitude:** -84.539049

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**Completion Date:** 1/1/2015

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Coordinates provided on the TC 99-1(B) are the approved location for this permit

Indemnities		
Type	Amount Required	Tracking Number
Performance Bond	2000.00	
Payment Bond	0	
Liability Insurance	0	

This permit has been: *attached D2-12*

APPROVED

DENIED

KellyA Baker

Engineer Branch Manager

NAME

*Kelly A. Baker*

TITLE

KellyA Baker

8/13/2014

SIGNATURE

DATE

The TC 99-1(B), including the application TC-99 1(A) and all related and accompanying documents and drawings make up the permit. It is not a permit unless both the TC 99-1(A) and TC 99-1(B) are both present.

D7 - 16

• Rev. 2-88

Page 1 of 1

COMMONWEALTH OF KENTUCKY  
TRANSPORTATION CABINET  
DEPARTMENT OF HIGHWAYS  
ENCROACHMENT PERMIT MISCELLANEOUS REQUIREMENTS

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THE FOLLOWING STIPULATIONS ARE REQUIREMENTS FOR YOUR APPROVED PERMIT NO. 07-2014-00313

- All roadside features (ditches, slopes, sidewalks, etc.) shall be restored to match existing conditions.
- The permittee shall be responsible for complying with appropriate temporary traffic control as described in the latest edition of the MUTCD (Manual on Uniform Traffic Control Devices).



# ENCROACHMENT PERMIT GENERAL NOTES & SPECIFICATIONS

Permit No. OPEN CUT

## 1. SAFETY

### A. General Provisions

- All signs and control of traffic shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition, Part VI, and safety requirements shall comply with the Permits Manual.
- All work necessary in shoulder or ditch line areas of a state highway shall be scheduled to be promptly completed so that hazards adjacent to the traveled way are kept to an absolute minimum.
- No more than one (1) traveled-lane shall be blocked or obstructed during normal working hours. All signs and flaggers during lane closure shall conform to the Manual on Uniform Traffic Control Devices.
- When necessary to block one (1) traveled-lane of a state highway, the normal working hours shall be as directed by the Department. No lanes shall be blocked or obstructed during adverse weather conditions (rain, snow, fog, etc.) without specific permission from the Department. Working hours shall be between 3:30 p.m. and 9:00 a.m.
- The traveled-way and shoulders shall be kept clear of mud and other construction debris at all times during construction of the permitted facility.
- No nonconstruction equipment or vehicles or office trailers shall be allowed on the right of way during working hours.
- The right of way shall be left free and clear of equipment, material, and vehicles during non-working hours.

### B. Explosives

- No explosive devices or explosive material shall be used within state right of way without proper license and approval of the Kentucky Department of Mines and Minerals, Explosive Division.

### C. Other Safety Requirements

- All workers within right-of-way shall wear high-visibility safety apparel that meets the performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standards for Safety Apparel and Headwear"

## 2. UTILITIES - ADVERSELY AFFECTED CONTROLLED ACCESS HIGHWAYS ONLY

- \*All work necessary within the right of way shall be performed behind a temporary fence erected prior to a boring operation.
- \*The temporary woven wire fence shall be removed immediately upon completion of work on the right of way, and the control of access immediately restored to original condition, in accordance with applicable Kentucky Department of Highways Standard Drawings.
- \*All vents, valves, manholes, etc., shall be located outside of the right-of-way.
- \*Encasement pipe shall extend from right-of-way line to right-of-way line and shall be one continuous run of pipe. The encasement pipe shall be welded at all joints.
- The boring pit and tail ditch shall extend past the existing toe of slope or bottom of ditch line and shall be a minimum of 42 inches deep.

Permit No. OPEN CUT

**II. UTILITIES (Continued)**

- Encasement pipe shall conform to current standards for highway crossings in accordance with the Permits Manual.
- Parallel lines shall be constructed between back slope of ditch line and right-of-way line and shall have a minimum of 30-inch cover above top of pipe or conduit.
- All pavement cuts shall be restored per Kentucky Transportation Cabinet form TC 99-13.
- Aerial crossing of this utility line shall have a minimum clearance of \_\_\_\_\_ feet from the high point of the roadway to the low point of the line (calculated at the coefficient for expansion of 120 degrees Fahrenheit).
- The 30-foot clear zone requirement shall be met to the extent possible in accordance with the Permits Manual.
- Special requirements:

Open cut must be covered prior to opening to traffic. This cover must be a steel plate, bituminous material or one inch (1") low concrete

**III. GENERAL**

- A. OSHA**
  - Kentucky Occupational Safety and Health Standards for the construction industry, which has the effect of law, states in part: (Page 52, 1926.651, Specific Excavation Requirements) "Prior to opening an excavation, effort shall be made to determine whether underground installations, (sewer, telephone, water, fuel, electric lines, etc.) will be encountered, and if so, where such underground installations are located. When the excavation approaches the estimated location of such an installation, the exact location shall be determined, and when it is uncovered, proper supports shall be provided for the existing installation. Utility companies shall be contacted and advised of proposed work prior to the start of actual excavation."
- B. Archaeological**
  - Whenever materials of an archaeological nature are discovered during the course of construction work or maintenance operations, contact shall be made immediately with the Division of Environmental Analysis, which maintains an archaeologist on staff, or with the Office of the State Archaeologist located at the University of Kentucky. Following this consultation, further action shall be decided on a case-by-case basis by the State Highway Engineer or the Transportation Planning Engineer or their designated representative.
- C. Utilities In the Work Areas**
  - The permittee shall be responsible for any damage to existing utilities, and any utility modifications or relocations within state right of way necessary, as determined by the Department or by the owner of the utility, shall be at the expense of the permittee and subject to the approval of the Department.
  - All existing manholes and valve boxes shall be adjusted to be flush with finished grade.
- D. Environmental**
  - If the activity to which this permit relates disturbs one acre or more of land, you must obtain a KPDES KYR10 permit.

**Websites**

<http://www.water.ky.gov/permitting/wastewaterpermitting/KPDES/storm/>

Inspectors for KPDES KYR10 at [www.KEPSC.org](http://www.KEPSC.org)

**IV. RIGHT OF WAY RESTORATION**

All disturbed portions of the right of way shall be restored to grass as per Kentucky Department of Highways Standard Specifications for Road and Bridge Construction (latest edition). A satisfactory turf, as determined by the Department shall be established by the permittee prior to release of indemnity. Sodding or seeding shall be as follows:

Lawn or High Maintenance Situation

70% Lawn Fescue (e.g., variety - Falcon)  
30% Bluegrass or

70% Lawn Rye (e.g., variety - Derby)  
30% Bluegrass

Right of Way Lawn Maintenance Situation

70% KY 31 Fescue  
30% Perennial Rye Grass or

100% KY Fescue

Two tons of clean straw mulch per acre of seeding.

Prior to seeding, the ground shall be prepared in accordance with Kentucky Department of Highways Standard Specifications for Road and Bridge Construction (latest edition).

Substitutes for sod such as artificial turf, rocked mulch, or paved areas may be acceptable if they are aesthetically pleasing.

All ditch-flow lines and all ditch-side slopes shall be sodded.

Existing concrete right of way markers shall not be disturbed, but if damaged in any way, they shall be entirely replaced by the permittee, with new concrete markers to match the original markers, in accordance with Kentucky Department of Highways Standard Drawings. Markers that are entirely removed shall be re-established in the proper locations by the permittee and to the satisfaction of the Department.

Other right of way restoration requirements are as follows:

**VE. DRAINAGE**

All pipe shall be laid in a straight alignment, to proper grades, and with all materials and methods of installation including bedding and joint seating in accordance with Department Standard Specifications for Road and Bridge Construction (latest edition). Pipe shall not be covered until inspected by the Department and express permission obtained to make backfill.

All gutter lines at the base of new curbs shall be on continuous grades, and pockets of water along with curbs or in entrance areas or other paved areas within the right of way shall not be acceptable.

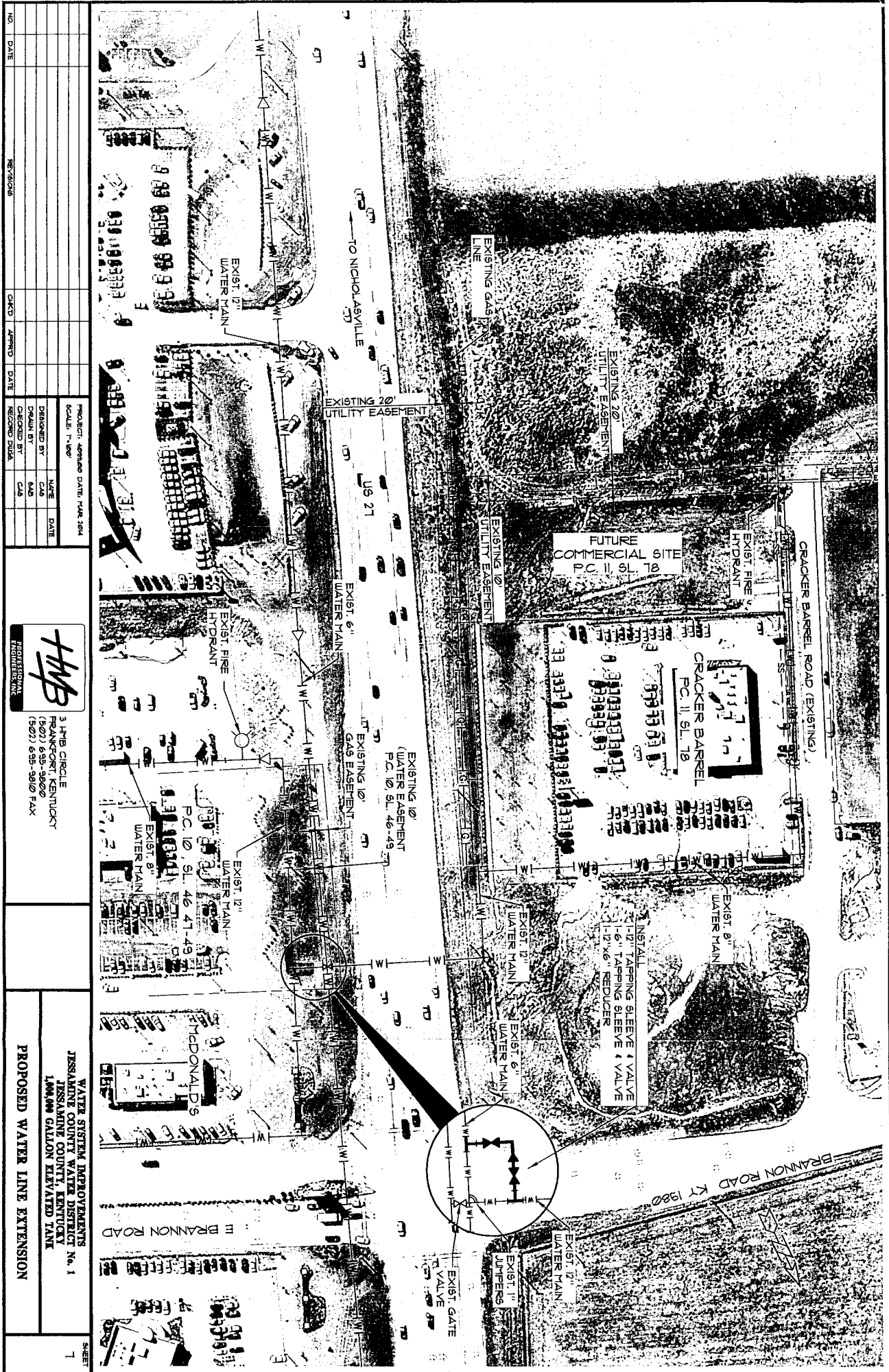
All drainage structures and appurtenances (manholes, catch basins, curbing, inlet basins, etc.) shall conform to Department specifications and shall be constructed in accordance with the Department Standard Drawings. Type required:

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## **NOTICE TO PERMITTEE**

THE PERMITTEE AGREES THAT ALL WORK WITHIN THE EXISTING RIGHT OF WAY SHALL BE DONE IN ACCORDANCE WITH THE PLANS AS APPROVED AND PERMITTED BY AN ENCROACHMENT PERMIT. ANY CHANGES OR VARIANCES MADE AT THE TIME OF CONSTRUCTION WITHOUT WRITTEN APPROVAL FROM THE DEPARTMENT OF HIGHWAYS SHALL BE REMOVED BY THE PERMITTEE AT NO EXPENSE TO THE DEPARTMENT OF HIGHWAYS AND SHALL BE REDONE BY THE PERMITTEE TO CONFORM WITH THE APPROVED PLANS.



NO.	DATE	REVISIONS	CADD	APPROV	DATE

PROJECT: 489400 DATE: MAR 2014  
 SCALE: 1"=80'

DESIGNED BY	DATE	NOTE
CAS		
CHKD BY		
RECORD DATA		

**THB** THUNDERBOLT ENGINEERS  
 3141B CIRCLE  
 FRANKFORT, KENTUCKY  
 (502) 653-3800 FAX

WATER SYSTEM IMPROVEMENTS  
 JESSAMINE COUNTY WATER DISTRICT No. 1  
 JESSAMINE COUNTY, KENTUCKY  
 1,000,000 GALLON ELEVATED TANK

**PROPOSED WATER LINE EXTENSION**

SHEET 7





HMB Professional  
Engineers, Inc.

AUG 27 2014

CAS  
KO  
JG

**Steven L. Beshear**  
Governor

**TRANSPORTATION CABINET**

Department of Highways District 7 Office  
P.O. Box 11127  
Lexington, KY 40512-1127  
(859) 246-2355

**Michael W. Hancock, P.E.**  
Secretary

Carl Waits  
Jessamine Co. Water District #1  
2225 Lexington Road  
Nicholasville, Kentucky 40356

Subject: Jessamine County MP 057-0027-013.596  
US 0027 (Lexington Road)  
Jessamine Co. Water District #1  
Utility (APP NO 07-2014-00312)

Dear Applicant:

Attached is your application for a permit that has been approved by the Department of Highways.

Please see that work is done in conformity with permit and applicable conditions. If you have any questions, please contact Ricky Sizemore, Permit Engineer, at (859) 246-2355.

Sincerely,

8/14/14  
Date

Kelly A. Baker, P.E.  
Branch Manager Engineering Support

KAB/mb  
Attachments



An Equal Opportunity Employer M/F/D



Kentucky Transportation Cabinet  
 Department of Highways  
 Permits Branch

TC 99-1 (A)  
 8/2012  
 Page 1 of 4

APPLICATION FOR ENCROACHMENT PERMIT

<b>Permittee Information</b>		KYTC No. <u>07-2014-00312</u>	
Name	Jessamine County Water District No.1	<b>Permit Information</b>	
Address	2225 Lexington Road	Address	
City	Nicholasville	City	Nicholasville
State	KY	State	KY
Zip	40356	Zip	40356
County	Jessamine	County	Jessamine
Phone#	859-885-9314	Route No.	27
		Mile-Point	13.596
Contact	Mr. Carl Waits, Chairman	Longitude (X)	84°32'47.40"W
Phone	859-948-5527 Cell	Latitude (Y)	37°56'25.32"N
Email	carl.waits@insightbb.com	<b>Information below to be filled out by KYTC</b>	
Contact	<u>CHRIS STEWART</u>	<input type="checkbox"/> Air Right	<input type="checkbox"/> Entrance
Phone	<u>502 695 9800</u> Cell	<input checked="" type="checkbox"/> Utilities	<input type="checkbox"/> Other: <u>underground</u>
Email	<u>castewart@hmbpe.com</u>	<input type="checkbox"/> Left	<input checked="" type="checkbox"/> Right
		<input type="checkbox"/> Full	<input type="checkbox"/> Partial
		<input type="checkbox"/> X-ing	<input checked="" type="checkbox"/> by Permit

General Description of Work:

JCWD No.1 proposes to install a control valve vault on an existing 8-inch water line at the intersection of US 27 and Bradley Drive.

JUL 29 2014  
 DEPARTMENT OF HIGHWAYS  
 DISTRICT 7  
 LEXINGTON

THE UNDERSIGNED PERMITTEE(s) (being duly authorized representative(s) or owner(s)) DO AGREE TO ALL TERMS AND CONDITIONS ON THE TC 99-1(A).

*Carl Waits*

7-23-2014

Signature

Date

This is not a permit unless and until the permittee(s) receives an approved TC 99-1(B) from KYTC. This application will become void if not approved by the cancellation date. The cancellation date will be one year from the date the permittee submits their application.



## APPLICATION FOR ENCROACHMENT PERMIT

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  - A. **PERFORMANCE BOND:** The permittee shall provide to the Department a performance bond according to the Permits Manual, Section PE-203 as a guarantee of conformance with the Department's Encroachment Permit requirements.
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6. Permittee, its successors and assigns, shall comply with and agrees to be bound by the requirements and terms of (a) this application and all related documents making up the approved permit, (b) by the Department's Permits Manual, and (c) by the Manual on Uniform Traffic Control Devices, both manuals as revised to and in effect on the date of issuance of the permit, all of which documents are made a part thereof by this reference. Compliance by the permittee, its successors and assigns, with subsequent revisions to applicable provisions of either manual or other policy of the Department may be made a condition of allowing the encroachment to persist under the permit.
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8. Permittee, its successors and assigns, agree that if the Department determines that motor vehicular safety deficiencies develop as a result of the installation or use of the encroachment, the permittee, its successors and assigns, shall provide and bear the expenses to adjust, relocate, or reconstruct the facilities, and/or add signs, auxiliary lanes, or other corrective measures reasonably deemed necessary by the Department within a reasonable time after receipt of a written notice of such deficiency. The period within which such adjustments, relocations, additions, modifications, and/or other corrective measures must be completed will be specified in the notice.



**APPLICATION FOR ENCROACHMENT PERMIT**

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10. The requested encroachment shall not infringe on the frontage rights of an abutting owner without their written consent as hereinafter described. Each abutting owner shall express their consent, which shall be binding on their successors and assigns, by the submission of a notarized statement as follows, "I (we), \_\_\_\_\_, hereby consent to the granting of the permit requested by the applicant along Route \_\_\_\_\_, which permit does affect frontage rights along my (our) adjacent real property." By signature(s) \_\_\_\_\_ subscribed and sworn by \_\_\_\_\_, on this date \_\_\_\_\_.

11. The permit, if approved, is subject to the agreement that it shall not interfere with any similar rights or permit(s) previously granted to any other party, except as otherwise provided by law.

12. Permittee shall include documentation which describes the facilities to be constructed. Permittee, its successors and assigns, agrees as a condition of the granting of the permit to construct and maintain any and all permitted facilities or other encroachments in strict accordance with the submitted and approved permit documentation and the policies and procedures of the Department. Permittee, its successors and assigns, shall not use facilities authorized herein in any manner contrary to that prescribed by the approved permit. Only normal usage as contemplated by the parties and by this application and routine maintenance are authorized by the permit.

13. Permittee, its successors and assigns, at all times from the date permitted work is commenced until such time as all permitted facilities or other encroachments are removed from the right-of-way and the right-of-way restored, shall defend, protect, indemnify and save harmless the Department from any and all liability claims and demands arising out of the work, encroachment, maintenance, or other undertaking by the permittee, its successors and assigns, related or undertaken pursuant to the granted permit, due to any claimed act or omission by the permittee, its servants, agents, employees, or contractors. This provision shall not inure to the benefit of any third party nor operate to enlarge any liability of the Department beyond that existing at common law or otherwise if this right to indemnity did not exist.

14. Upon a violation of any provision of the permit, or otherwise in its reasonable discretion, the Department may require additional action by the permittee, its successors and assigns, up to and including the removal of the encroachment and restoration of the right-of-way. In the event additional actions required by the Department under the permit are not undertaken as ordered and within a reasonable time, the Department may in its discretion cause those or other additional corrective actions to be undertaken and the Department may and shall recover the reasonable costs of those corrective actions from the permittee, its successors and assigns.

15. Permittee, its successors and assigns, shall use the encroachment premises in compliance with all requirements of federal law and regulation, including those imposed pursuant to Title VI of the Civil Right Act of 1964 (42 U.S.C. § 2000d et seq.) and the related regulations of the U.S. Department of Transportation in Title 49 C.F.R. Part 21, all as amended.



### **APPLICATION FOR ENCROACHMENT PERMIT**

**16.** Permittee, its successors and assigns, agree that if the Department determines it is necessary for the facilities or other encroachment authorized by the permit to be removed, relocated or reconstructed in connection with the reconstruction, relocation or improvement of a highway, the Department may revoke permission for the encroachment to remain under the permit and may order its removal, relocation or reconstruction by the permittee, its successors and assigns, at the expense of the permittee, except where the Department is required by law to pay any or all of those costs.

**17.** Permittee agrees that the authorized permit is personal to the permittee and shall remain in effect until such time as (a) the permittee's rights to the adjoining real property to have benefitted from the requested encroachment have been relinquished, (b) until all permit obligations have been assumed by appropriate successors and assigns, and (c) unless and until a written release from permit obligations has been granted by the Department. The permit and its requirements shall also bind the real property to have benefitted from the requested encroachment to the extent permitted by law. The permit and the related encroachment become the responsibility of the successors and assigns of the permittee and the successors and assigns of each property owner benefitting from the encroachment, or the encroachment may not otherwise permissibly continue to be maintained on the right-of-way. (Does not apply to utility encroachments serving the general public.)

**18.** If work authorized by the permit is within a highway construction project in the construction phase, it shall be the responsibility of the permittee to make personal contact with the Department's Engineer on the project in order to coordinate all permitted work with the Department's prime contractor on the project.

**19.** This permit is not intended to, nor shall it, affect, alter or alleviate any requirement imposed upon the permittee, its successors and assigns, by any other agency.

**20.** Permittee, its successors and assigns, agrees to contain and maintain all dirt, mud, and other debris emanating from the encroachment away from the surrounding right-of-way and the travel way of the highway hereafter and at all times that its obligations under the permit remain in effect.



**ENCROACHMENT PERMIT**

KEPTS No.: A07-2014-00312  
 \_\_\_\_\_  
 Permittee: Jessamine County Water District #1  
 \_\_\_\_\_  
 Latitude: 37.940457  
 \_\_\_\_\_  
 Longitude: -84.546741  
 \_\_\_\_\_  
 Completion Date: 1/1/2015  
 \_\_\_\_\_

Coordinates provided on the TC 99-1(B) are the approved location for this permit

Indemnities		
Type	Amount Required	Tracking Number
Performance Bond	2000.00	
Payment Bond	0	
Liability Insurance	0	

This permit has been: *attached DR-11*

APPROVED  DENIED

KellyA Baker  
 \_\_\_\_\_  
 Engineer Branch Manager  
 NAME TITLE  
 KellyA Baker *Kelly A. Baker*  
 \_\_\_\_\_  
 8/13/2014  
 SIGNATURE DATE

The TC 99-1(B), including the application TC-99 1(A) and all related and accompanying documents and drawings make up the permit. It is not a permit unless both the TC 99-1(A) and TC 99-1(B) are both present.

COMMONWEALTH OF KENTUCKY  
TRANSPORTATION CABINET  
DEPARTMENT OF HIGHWAYS  
ENCROACHMENT PERMIT MISCELLANEOUS REQUIREMENTS

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THE FOLLOWING STIPULATIONS ARE REQUIREMENTS FOR YOUR APPROVED PERMIT NO. 07-2014-00312

- Permittee shall be responsible for replacing/repairing any damaged signal equipment (wire, loops, cabinet, etc.) that may result from the permitted work.
- All roadside features (ditches, slopes, sidewalks, etc.) shall be restored to match existing conditions.



## ENCROACHMENT PERMIT GENERAL NOTES & SPECIFICATIONS

Permit No. OPEN CUT

### 1. SAFETY

#### A. General Provisions

- All signs and control of traffic shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition, Part VI, and safety requirements shall comply with the Permits Manual.
- All work necessary in shoulder or ditch line areas of a state highway shall be scheduled to be promptly completed so that hazards adjacent to the traveled way are kept to an absolute minimum.
- No more than one (1) traveled-lane shall be blocked or obstructed during normal working hours. All signs and flaggers during lane closure shall conform to the Manual on Uniform Traffic Control Devices.
- When necessary to block one (1) traveled-lane of a state highway, the normal working hours shall be as directed by the Department. No lanes shall be blocked or obstructed during adverse weather conditions (rain, snow, fog, etc.) without specific permission from the Department. Working hours shall be between 9:00 a.m. and 3:30 p.m.
- The traveled-way and shoulders shall be kept clear of mud and other construction debris at all times during construction of the permitted facility.
- No nonconstruction equipment or vehicles or office trailers shall be allowed on the right of way during working hours.
- The right of way shall be left free and clear of equipment, material, and vehicles during non-working hours.

#### B. Explosives

- No explosive devices or explosive material shall be used within state right of way without proper license and approval of the Kentucky Department of Mines and Minerals, Explosive Division.

#### C. Other Safety Requirements

- All workers within right-of-way shall wear high-visibility safety apparel that meets the performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standards for Safety Apparel and Headwear"

### 2. UTILITIES - Access to Utility Controlled Access Highway ONLY

- \*All work necessary within the right of way shall be performed behind a temporary fence erected prior to a boring operation.
- \*The temporary woven wire fence shall be removed immediately upon completion of work on the right of way, and the control of access immediately restored to original condition, in accordance with applicable Kentucky Department of Highways Standard Drawings.
- \*All vents, valves, manholes, etc., shall be located outside of the right-of-way.
- \*Encasement pipe shall extend from right-of-way line to right-of-way line and shall be one continuous run of pipe. The encasement pipe shall be welded at all joints.
- The boring pit and tail ditch shall extend past the existing toe of slope or bottom of ditch line and shall be a minimum of 42 inches deep.



Permit No. OPEN CUT

**II. UTILITIES (Continued)**

- Encasement pipe shall conform to current standards for highway crossings in accordance with the Permits Manual.
- Parallel lines shall be constructed between back slope of ditch line and right-of-way line and shall have a minimum of 30-inch cover above top of pipe or conduit.
- All pavement cuts shall be restored per Kentucky Transportation Cabinet form TC 99-13.
- Aerial crossing of this utility line shall have a minimum clearance of \_\_\_\_\_ feet from the high point of the roadway to the low point of the line (calculated at the coefficient for expansion of 120 degrees Fahrenheit).
- The 30-foot clear zone requirement shall be met to the extent possible in accordance with the Permits Manual.
- Special requirements:

Open cut must be covered prior to opening to traffic. This cover must be a steel plate, bituminous material or one inch (1") low concrete

**III. GENERAL**

**A. OSHA**

- Kentucky Occupational Safety and Health Standards for the construction industry, which has the effect of law, states in part: (Page 52, 1926.651, Specific Excavation Requirements) "Prior to opening an excavation, effort shall be made to determine whether underground installations, (sewer, telephone, water, fuel, electric lines, etc.) will be encountered, and if so, where such underground installations are located. When the excavation approaches the estimated location of such an installation, the exact location shall be determined, and when it is uncovered, proper supports shall be provided for the existing installation. Utility companies shall be contacted and advised of proposed work prior to the start of actual excavation."

**B. Archaeological**

- Whenever materials of an archaeological nature are discovered during the course of construction work or maintenance operations, contact shall be made immediately with the Division of Environmental Analysis, which maintains an archaeologist on staff, or with the Office of the State Archaeologist located at the University of Kentucky. Following this consultation, further action shall be decided on a case-by-case basis by the State Highway Engineer or the Transportation Planning Engineer or their designated representative.

**C. Utilities in the Work Areas**

- The permittee shall be responsible for any damage to existing utilities, and any utility modifications or relocations within state right of way necessary, as determined by the Department or by the owner of the utility, shall be at the expense of the permittee and subject to the approval of the Department.
- All existing manholes and valve boxes shall be adjusted to be flush with finished grade.

**D. Environmental**

- If the activity to which this permit relates disturbs one acre or more of land, you must obtain a KPDES KYR10 permit.

Websites

<http://www.water.ky.gov/permitting/wastewaterpermitting/KPDES/storm/>

Inspectors for KPDES KYR10 at [www.KEPSC.org](http://www.KEPSC.org)

**IV. RIGHT OF WAY RESTORATION**

All disturbed portions of the right of way shall be restored to grass as per Kentucky Department of Highways Standard Specifications for Road and Bridge Construction (latest edition). A satisfactory turf, as determined by the Department shall be established by the permittee prior to release of indemnity. Sodding or seeding shall be as follows:

Lawn or High Maintenance Situation

70% Lawn Fescue (e.g., variety - Falcon)  
30% Bluegrass or

70% Lawn Rye (e.g., variety - Derby)  
30% Bluegrass

Right of Way Lawn Maintenance Situation

70% KY 31 Fescue  
30% Perennial Rye Grass or

100% KY Fescue

Two tons of clean straw mulch per acre of seeding.

Prior to seeding, the ground shall be prepared in accordance with Kentucky Department of Highways Standard Specifications for Road and Bridge Construction (latest edition).

Substitutes for sod such as artificial turf, rocked mulch, or paved areas may be acceptable if they are aesthetically pleasing.

All ditch-flow lines and all ditch-side slopes shall be sodded.

Existing concrete right of way markers shall not be disturbed, but if damaged in any way, they shall be entirely replaced by the permittee, with new concrete markers to match the original markers, in accordance with Kentucky Department of Highways Standard Drawings. Markers that are entirely removed shall be re-established in the proper locations by the permittee and to the satisfaction of the Department.

Other right of way restoration requirements are as follows:

**V. DRAINAGE**

All pipe shall be laid in a straight alignment, to proper grades, and with all materials and methods of installation including bedding and joint seating in accordance with Department Standard Specifications for Road and Bridge Construction (latest edition). Pipe shall not be covered until inspected by the Department and express permission obtained to make backfill.

All gutter lines at the base of new curbs shall be on continuous grades, and pockets of water along with curbs or in entrance areas or other paved areas within the right of way shall not be acceptable.

All drainage structures and appurtenances (manholes, catch basins, curbing, inlet basins, etc.) shall conform to Department specifications and shall be constructed in accordance with the Department Standard Drawings. Type required:

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## **NOTICE TO PERMITTEE**

THE PERMITTEE AGREES THAT ALL WORK WITHIN THE EXISTING RIGHT OF WAY SHALL BE DONE IN ACCORDANCE WITH THE PLANS AS APPROVED AND PERMITTED BY AN ENCROACHMENT PERMIT. ANY CHANGES OR VARIANCES MADE AT THE TIME OF CONSTRUCTION WITHOUT WRITTEN APPROVAL FROM THE DEPARTMENT OF HIGHWAYS SHALL BE REMOVED BY THE PERMITTEE AT NO EXPENSE TO THE DEPARTMENT OF HIGHWAYS AND SHALL BE REDONE BY THE PERMITTEE TO CONFORM WITH THE APPROVED PLANS.



**From:** [Gary Goldey](#)  
**To:** [bbaxter@hmbpe.com](mailto:bbaxter@hmbpe.com)  
**Cc:** ["Chris Stewart"](#); ["Tom Calkins"](#); ["Tim Cross"](#); ["Roberta Warren"](#)  
**Subject:** RE: County Road Encroachment  
**Date:** Friday, July 25, 2014 12:48:32 PM

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Mr. Baxter,

Good to hear from you. From the City of Nicholasville's side you are permitted to encroach on our right-of-way, and please use proper signage according to the MUTCD standards. Any encroachment on state right-of-way will require you to speak with the Transportation Cabinet, District 7. Good luck on your project and feel free to contact us with any other questions.

Sincerely,

Gary L. Goldey

---

**From:** Brandon Baxter [mailto:bbaxter@hmbpe.com]  
**Sent:** Friday, July 25, 2014 9:28 AM  
**To:** gary\_goldey@nicholasville.org  
**Cc:** Chris Stewart  
**Subject:** County Road Encroachment

Mr. Goldey,

As part of their Water System Improvements Project, Jessamine County Water District No.1 will be installing a control valve and vault on an existing 8-inch water line at the intersection of US 27 (Lexington rd.) and Bradley Drive. On behalf of the District I would like to request permission to encroach on the county road right-of-way should the need arise. The District has easement where the existing line is laid however, if there is not enough room to install the control valve vault it may be necessary to encroach upon Jessamine County right-of-way.

In no way does the District plan to install any utility within paved areas of the roadway and the only encroachment that may occur would be in the county right-of-way near Bradley road.

Attached for your review is a plan sheet showing the proposed control valve and an approximate location of where it will be located.

Should you need any additional information or have any question please do not hesitate to contact me either by return email or at (502) 695-9800.

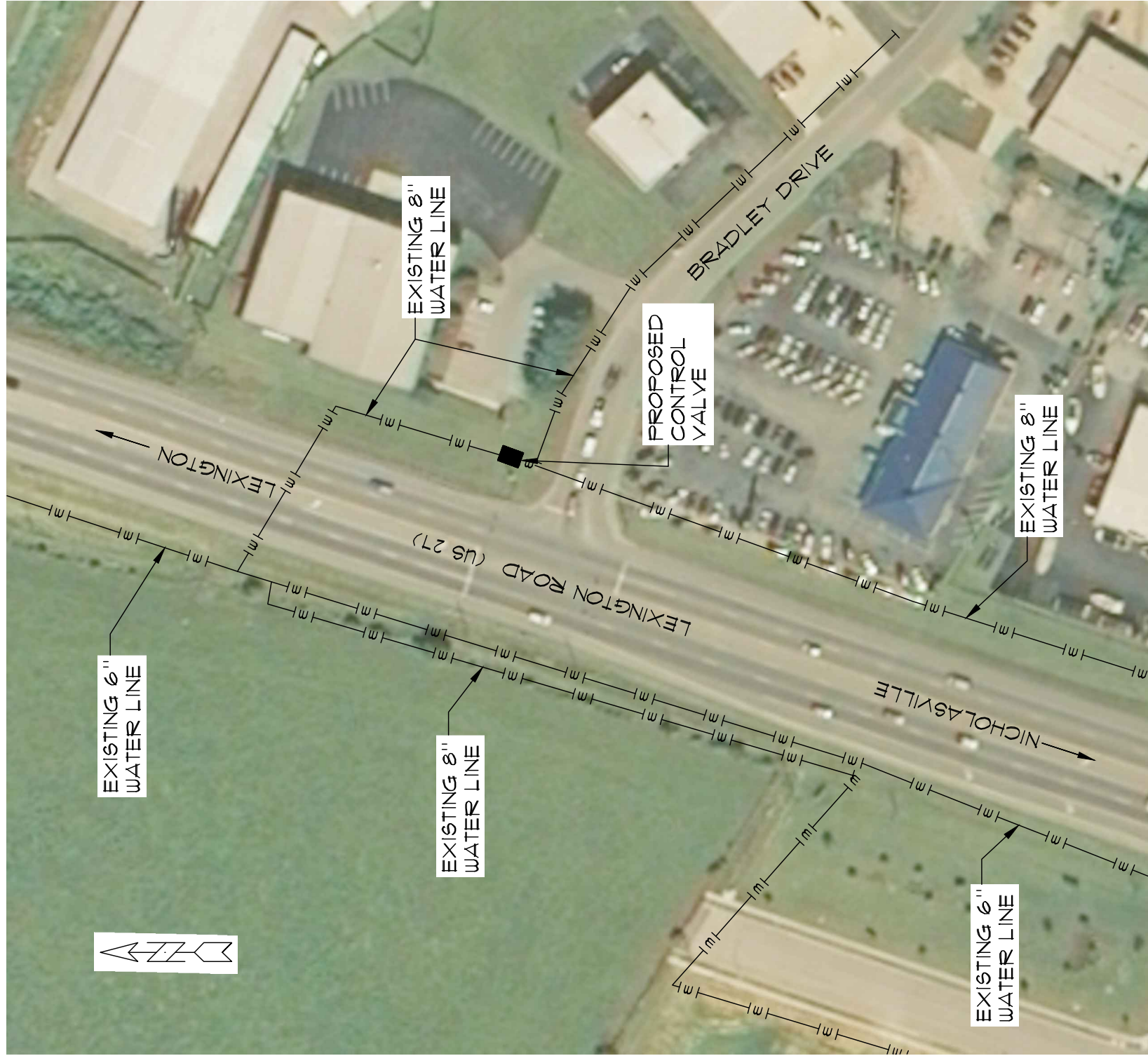
Sincerely,

Brandon G. Baxter, PE

HMB Professional Engineers, Inc.

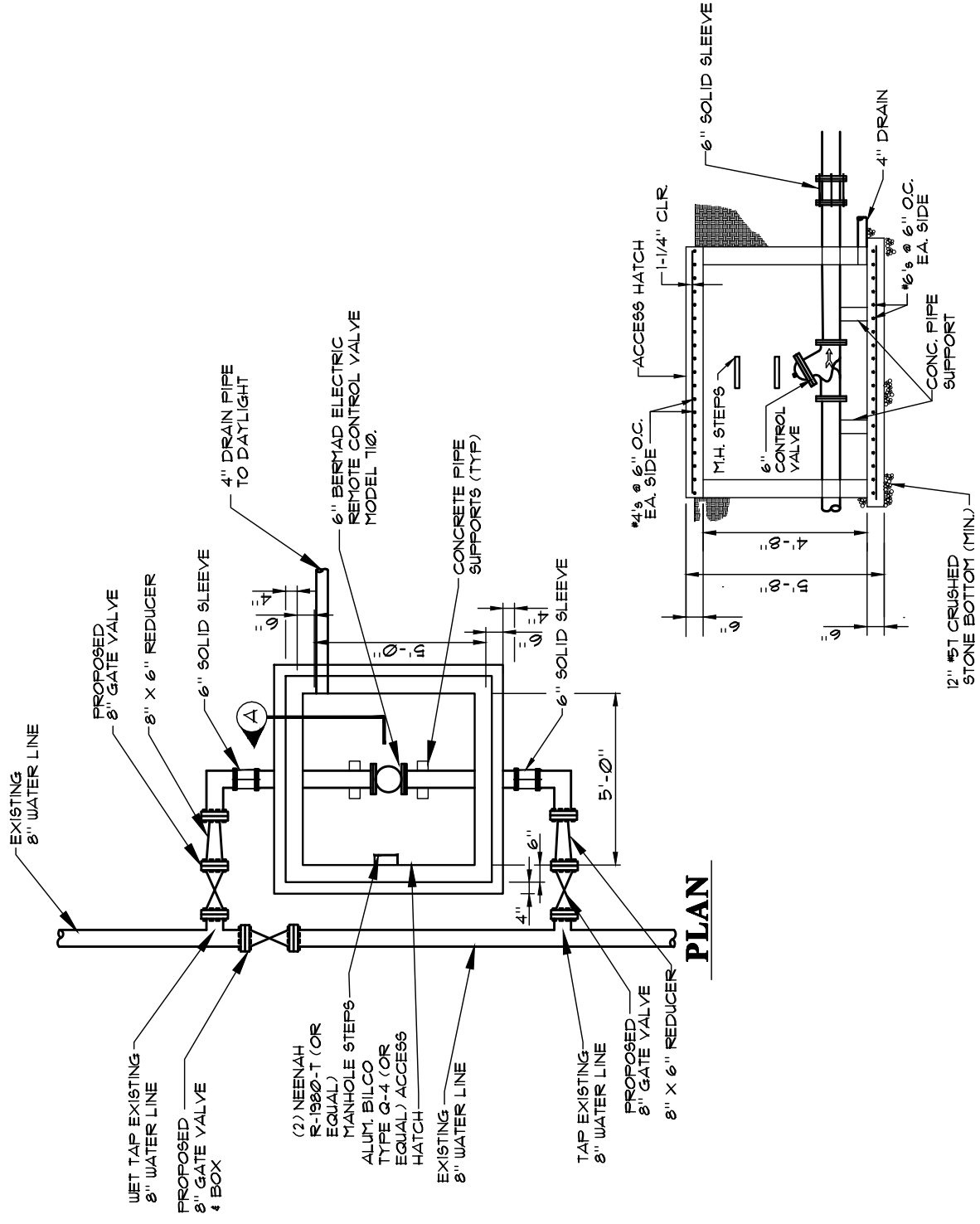
3 HMB Circle

Frankfort, KY 40601



**CONTROL VALVE SITE PLAN**

SCALE: N.T.S.



**SECTION A**

- NOTE: 1. ALL PIPING & FITTINGS WITHIN VALVE SHALL BE FLANGED DUCTILE IRON.
2. THE ELECTRIC SOLENOID-CONTROLLED VALVE SHALL BE A BERHAD MODEL T10 WITH STAINLESS STEEL TUBING, VALVE POSITION INDICATOR, CLOSING AND OPENING SPEED CONTROL, CHOKING BURGE PREVENTION, HEAD LOSS REDUCING BODIES STYLE DUCTILE IRON BODY, FLANGED END RATED FOR 250 PSI, BLUE COATING, LAISE CONTROL FILTERED ELECTRIC LIMIT SWITCH ENCLOSED IN A NEMA 4 BOX, AS REPRESENTED BY CI THORNBURG COMPANY.
3. CONTRACTOR SHALL PROVIDE TAPPED CONNECTIONS AND PRESURE GAUGES FOR SAMPLING ON BOTH SIDES OF CONTROL VALVE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ELECTRIC POWER TO VALVE.
5. CONTRACTOR SHALL PROVIDE FLANGED COUPLING ADAPTER ON ALL PIPING ENTERING VAULT.

**DRAGSTRIP TANK CONTROL VALVE**

SCALE: N.T.S.

NO.	DATE	REVISIONS	CHK'D	APPR'D	DATE	PROJECT: 4099.00 DATE: MAR 2014	
						SCALE: AS NOTED	SCALE: AS NOTED
						DESIGNED BY	CAS
						DRAWN BY	SAB
						CHECKED BY	CAS
						RECORD DWGS.	



3 HMB CIRCLE  
FRANKFORT, KENTUCKY  
(502) 695-9800  
(502) 695-9810 FAX

SHEET  
CV-1

**WATER SYSTEM IMPROVEMENTS  
JESSAMINE COUNTY WATER DISTRICT No. 1  
JESSAMINE COUNTY, KENTUCKY  
PUMP STATION & 12" WATER LINE EXTENSIONS**

**CONTROL VALVE SITE PLAN**





**APPENDIX 7**

**ADDENDA (IF ANY)**





3 HMB Circle  
 US 460  
 Frankfort, KY 40601  
 Office: (502) 695-9800  
 Fax: (502) 695-9810  
 www.hmbpe.com

ADDENDUM No. 1

WATER SYSTEM IMPROVEMENTS PROJECT  
 1,000,000 GALLON ELEVATED TANK  
 JESSAMINE COUNTY WATER DISTRICT No. 1  
 JESSAMINE COUNTY, KENTUCKY

Bid Opening Date: Tuesday February 24, 2015 @ 11:00 AM Local Time  
 Date of Addendum: Monday February 16, 2015

Bidders shall conform to the following changes as same shall become binding upon the Contracts to be issued in response to the invitation to bid. The Contract Documents shall be revised and/or amended as set forth herein:

1. The following shall be added to the end of specification Section 13210 Elevated Water Tank on page 13210-10:

**8.0 BASIS OF DESIGN**

The basis and intent of the design of this project is as stated in the specifications and shown on the plans. Alternative styles and construction methods of elevated water tanks will be considered and Bids may be submitted by CONTRACTORS for tanks other than welded steel construction.

The lowest responsive, responsible Bid that meets the criteria established by the Contract Documents shall be the basis for Award.

2. Construction completion time shall be 365 consecutive calendar days. Any reference to 270 days, or any other number, within the contract documents shall now be changed to 365 consecutive calendar days. Final completion date shall be established in the executed Notice to Proceed.
3. Bidders should note that AWWA D107, current edition, shall govern composite tank design and construction and is incorporated by reference into the contract documents. Any composite tank bidder will be responsible for documenting compliance with AWWA D107, current edition.  
  
Only tanks that comply with AWWA standards will be considered.
4. Any Bidder must demonstrate compliance with NSF 61.

Highway Engineering  
 Structural Engineering  
 Water & Wastewater  
 Site Development  
 Right-of-Way  
 Master Planning  
 Environmental Planning  
 Surveying  
 Project Management  
 Cost Estimation  
 Construction Inspection  
 Aviation Services  
 Environmental Remediation  
 Landscape Architecture



3 HMB Circle  
US 460  
Frankfort, KY 40601  
Office: (502) 695-9800  
Fax: (502) 695-9810  
[www.hmbpe.com](http://www.hmbpe.com)

5. The OWNER reserves the right to evaluate any and all Bids received on criteria beyond simple lowest construction cost in order to make a determination of lowest responsive and responsible Bid for the long-term needs of the OWNER.

Criteria for evaluation include, but are not limited to: aesthetics, recent regional performance of tanks of similar design, availability of local repair and maintenance contractors, experience and reputation of the contractor based upon recent projects completed in the region, etc.

END OF ADDENDUM No. 1

Receipt of any and all Addenda must be acknowledged on the Bid Schedule. Failure to do so shall be cause for rejection of the Bid.

By: ***HMB Professional Engineers, Inc.***

Chris A Stewart, PE  
Project Manager

Highway Engineering

Structural Engineering

Water & Wastewater

Site Development

Right-of-Way

Master Planning

Environmental Planning

Surveying

Project Management

Cost Estimation

Construction Inspection

Aviation Services

Environmental Remediation

Landscape Architecture



ADDENDUM No. 2

WATER SYSTEM IMPROVEMENTS PROJECT  
1,000,000 GALLON ELEVATED TANK  
JESSAMINE COUNTY WATER DISTRICT No. 1  
JESSAMINE COUNTY, KENTUCKY

3 HMB Circle  
US 460  
Frankfort, KY 40601  
Office: (502) 695-9800  
Fax: (502) 695-9810  
www.hmbpe.com

Bid Opening Date: Tuesday February 24, 2015 @ 11:00 AM Local Time  
Date of Addendum: Thursday February 19, 2015

Bidders shall conform to the following changes as same shall become binding upon the Contracts to be issued in response to the invitation to bid. The Contract Documents shall be revised and/or amended as set forth herein:

1. New electrical service is required at four (4) locations:
  - a. New Brannon Tank
  - b. New Brannon Booster Pump Station/Ash Tree Master Meter
  - c. New Dragstrip Industrial Park Control Valve
  - d. Existing Brannon Crossing Master Meter
2. Electric Service at other project sites is existing and available
3. All costs associated with new electrical services, or modification of existing electrical services, is the responsibility of the CONTRACTOR and those costs shall be included in the Bid.
4. New electrical service locations are split between Kentucky Utilities and Blue Grass Energy.
5. There are seven (7) locations for SCADA RTU installation, and one (1) location for SCADA MTU installation. A revised SCADA location map is included with this Addendum No. 2 and shall supersede the map shown on plan sheet SC-1.
6. Bid Item 16 shall be changed to 20" steel casing pipe and the steel casing pipe to be installed by open cut shown on plan sheet PS-1 shall be 20" with a minimum wall thickness of 0.281". A detail drawing is included in this Addendum No. 2.
7. Specification Section 11200 Booster Pump Station section 2.54 on page 11200-25 shall be modified to include a total of twelve (12) Auxiliary Circuit Breakers.
8. Bidders with the capability of submitting Bids for multiple styles of elevated water storage tanks shall submit a single Bid for their lowest cost style of elevated water storage tank in Bid Item 1.
9. All Bidders shall submit a price for Bid Item 4 Tank Containment, regardless of style of tank proposed to be constructed in their Bid. Incomplete or qualified Bid Schedules could result in rejection of the Bid.

Highway Engineering

Structural Engineering

Water & Wastewater

Site Development

Right-of-Way

Master Planning

Environmental Planning

Surveying

Project Management

Cost Estimation

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Landscape Architecture



3 HMB Circle  
US 460  
Frankfort, KY 40601  
Office: (502) 695-9800  
Fax: (502) 695-9810  
[www.hmbpe.com](http://www.hmbpe.com)

Project circumstances could dictate the use of containment on this project regardless of style of tank submitted. The OWNER reserves the right to require containment per the Contract Documents if circumstances arise that require its use in the judgment of the OWNER.

10. Welded steel multi-leg and welded steel composite are approved tank styles for submittal of Bids on this project.
11. A revised Bid Schedule is included with this Addendum No. 2. All Bidders shall utilize the attached revised Bid Schedule in order to be in compliance with the Contract Documents.

Changes to the Bid Schedule are in Item 1, which now requires Bidders to write in the style of tank being Bid and Item 16, which is now 20" steel casing pipe installed by open cut.

12. Additional required bidding documents (Bid Bond, Certification for Contracts, Grants and Loans, Certification Regarding Debarment and Compliance Statement) are included with the revised Bid Schedule for Bidders convenience only and are unchanged by this Addendum.

END OF ADDENDUM No. 2

Receipt of any and all Addenda must be acknowledged on the Bid Schedule. Failure to do so shall be cause for rejection of the Bid.

By: ***HMB Professional Engineers, Inc.***

Chris A Stewart, PE  
Project Manager

Highway Engineering

Structural Engineering

Water & Wastewater

Site Development

Right-of-Way

Master Planning

Environmental Planning

Surveying

Project Management

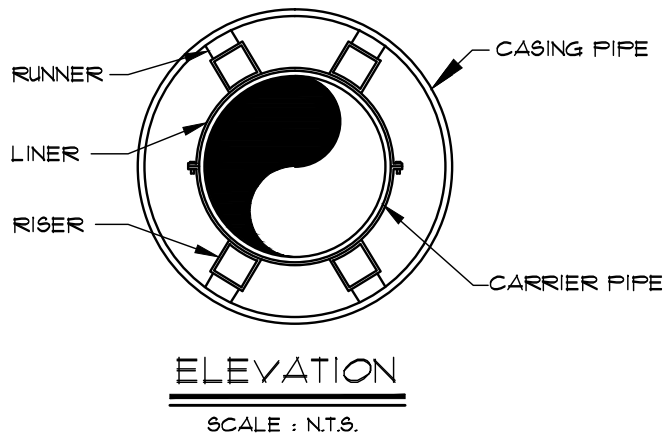
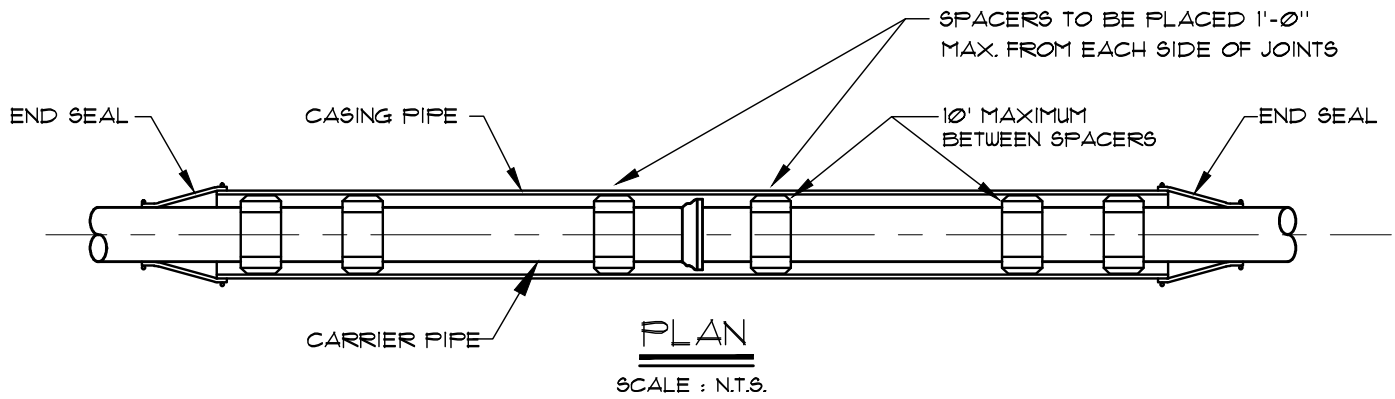
Cost Estimation

Construction Inspection

Aviation Services

Environmental Remediation

Landscape Architecture




**ENCASEMENT PIPE SPACER**  
SCALE : N.T.S.

TYPICAL ROAD CROSSING NOTES:

1. ALL JOINTS SHALL BE SOLIDLY WELDED. END OF CASING SHALL BE SEALED AFTER LINE HAS BEEN INSTALLED AND TESTED.
2. MINIMUM DEPTHS MAY INCREASE IN AREAS WHICH REQUIRE MINIMUM SEPARATION WITH OTHER FACILITIES.
3. OPEN TRENCH NO CLOSER THAN THE DITCH LINE OR TOE FILL FROM THE EDGE OF THE PAVEMENT OR AS DIRECTED BY STATE, COUNTY OR MUNICIPAL SPECIFICATIONS, WHEN INSTALLING BY BORE.
4. HIGHWAY CROSSINGS SHALL UTILIZE STEEL CASING PIPE. STEEL CASING PIPES 4" AND LESS SHALL BE NEW SCHEDULE 40. STEEL CASING PIPES LARGER THAN 4" AND UP TO 20" SHALL HAVE MINIMUM WALL THICKNESS OF 0.25". 20" CASING PIPE SHALL BE A MINIMUM WALL THICKNESS OF 0.281".
5. ALL BORED AND JACKED ENCASEMENT PIPE SHALL BE INSTALLED IN BORE HOLES NO LARGER THAN THE OUTSIDE DIAMETER OF THE ENCASEMENT PIPE.
6. SDR-21 SHALL BE USED FOR PVC CASING FOR COUNTY ROADS, WHERE PVC CASING PIPE IS REQUIRED.
7. STEEL CASING PIPE SHALL CONFORM TO ASTM A 252 GRADE 2 OR ASTM A 139 GRADE B.
8. MORE STRINGENT REQUIREMENTS STATED IN ANY RELEVANT PERMIT SHALL PREVAIL.

**WATER SYSTEM IMPROVEMENTS  
JESSAMINE CO. WATER DISTRICT No. 1  
JESSAMINE COUNTY, KENTUCKY  
ADDENDUM No. 2**

	SCALE : N.T.S.
	DATE : FEB. 2015
	DRAWN BY : SAB
	CHECKED BY : CAS





ADDENDUM No. 2

BID SCHEDULE  
1,000,000 GALLON ELEVATED TANK  
WATER SYSTEM IMPROVEMENTS PROJECT  
JESSAMINE COUNTY WATER DISTRICT No. 1  
JESSAMINE COUNTY, KENTUCKY  
FEBRUARY 2015

Proposal of \_\_\_\_\_ (hereinafter called "BIDDER"), organized and existing under the laws of the State of \_\_\_\_\_ doing business as \* to the Jessamine County Water District No. 1 (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all work for the construction of Water System Improvements Project, 1,000,000 Gallon Elevated Tank in strict accordance with the Contract Documents, within the time set forth therein, and at the prices stated below.

By submission of this bid, each BIDDER certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that this bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this bid with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence work under this contract on or before a date to be specified in the Notice to Proceed and to fully complete the project within **365** consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of **\$1,000.00** for each consecutive calendar day that the work remains incomplete after the expiration date of the contract.

BIDDER acknowledges receipt of the following Addenda:

Addendum No. \_\_\_\_\_ Addendum No. \_\_\_\_\_ Addendum No. \_\_\_\_\_

The BIDDER hereby proposes to furnish and do all that is required by the contract to which this refers for the construction of all structures listed at the prices shown for each bid item on the following Bid Schedule. (The Bid Schedule attached lists the various divisions of construction contemplated in the Plans and Specifications, together with an estimate of the units of each. With these units as the basis, the BIDDER will extend each item, using the cost he inserts in the unit column. Any total cost found inconsistent with the unit cost when the bids are examined will be deemed in error and corrected to agree with the unit cost which shall be considered correct).

\*Insert "a corporation", "a partnership", or "an individual" as applicable.

The undersigned BIDDER does hereby declare and stipulate that this proposal is made in pursuance of and subject to all terms and conditions of the Instructions to Bidders, the Construction Contract, the Technical Specifications, and the Plans pertaining to the work to be done, all of which have been examined by the undersigned.

Accompanying this proposal is a certified check or standard bid bond (5% of the Total Bid) in the sum of dollars and \_\_\_\_\_ cents (\$ \_\_\_\_\_) in accordance with the Instructions to Bidders.

The undersigned BIDDER agrees to execute the contract and Performance and Payment Bond for the amount of the total of this bid within 10 calendar days from the date when the written Notice of Award of the contract is delivered to him at the address given in this proposal. The name and address of the corporate surety with which the BIDDER proposes to furnish the specified Performance and Payment Bond is as follows:

\_\_\_\_\_  
\_\_\_\_\_

All the various phases of work enumerated in the Technical Specifications with their individual jobs and overhead, whether specifically mentioned, included by implication or appurtenant thereto, are to be performed by the Contractor under one of the items listed in the Bid Schedule, irrespective of whether it is named in said list.

Payment for work performed will be in accordance with the Bid Schedule, subject to changes as provided for the Construction Contract.

The BIDDER understands that the OWNER reserves the right to reject any or all bids and to waive any informalities in the bidding.

The BIDDER agrees that this bid shall be good and may not be withdrawn for a period of 90 calendar days after the scheduled closing time for receiving bids.

Bids shall include sales tax and all other applicable taxes and fees.

The BIDDER is strongly encouraged to closely review the Special Conditions and Instructions to Bidders. Submittal of Bid shall constitute acknowledgement by the Bidder of the contents of these sections, as well as the contents of the entire Contract Documents.

The following Bid Items include a general description of each Item. Detailed information of the work to be included may be found in the various sections of the Contract Documents.

BID SCHEDULE

**Water System Improvements Project - 1,000,000 Gallon Elevated Tank**

Item			Unit			
<u>No.</u>	<u>Item Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Price</u>		<u>Total</u>
1	1,000,000 Gallon Elevated Tank, including Tank, Tank Foundation, Overflow Line, Splash Pad, Site Preparation and Restoration, Excavation, and all Appurtenances, as Shown on the Plans and Specifications, Complete in Place	1	LS	\$ _____	\$ _____	
	Write in Tank Style Proposed in Bid Item No. 1 Above:					_____
2	Tank Valve Vault and Associated Piping, including Unclassified Excavation, Installation, Valves, Interior and Exterior 12" DIP Piping, Bypass 12" DIP Piping, 12" DIP Piping from Fence to Vault, Fire Hydrant, Sump Pump and Electrical Service, and all Required Appurtenances, as Shown on the Plans and Specifications, Complete in Place	1	LS	\$ _____	\$ _____	
3	Roof Corral/Handrail Including all Materials, Installation and Coatings, as described in the Contract Documents and Shown on the Plans, Complete in Place	1	LS	\$ _____	\$ _____	
4	Tank Containment During Surface Preparation and Painting, including all Materials and Labor, as Described in the Contract Documents, including Installation and Removal	1	LS	\$ _____	\$ _____	
5	Tank Sign Application and Coatings as Described in the Contract Documents, Complete in Place	1	LS	\$ _____	\$ _____	
6	Tank Site Fencing Including all Materials and Labor for Installation as Described in the Contract Documents, Complete in Place	1	LS	\$ _____	\$ _____	
7	Tank Access Road as Described in the Contract Documents and Geotechnical Report and as Shown on the Plans, Including all Required Unclassified Excavation, Labor and Materials and Removal if Required by Property Owner, Complete in Place	1	LS	\$ _____	\$ _____	

8	1,000,000 Gallon (nominal) Water Storage Tank Interior Coatings Including, but not Limited to: SSPC-SP 10 Blast, Coatings and Application, Up to 50 LF of Sikaflex-1a Calking, Sterilization, Site Clean Up, all Incidental Work Necessary to Place the Tank into Operating Condition, Providing all Materials, Tools, Equipment and Labor Necessary to Paint the Interior in Accordance with the Contract Documents, Complete in Place	1	LS	\$ _____	\$ _____
9	1,000,000 Gallon (nominal) Water Storage Tank Exterior Coating including, but not limited to: SSPC-SP 6 Blast, Specified Coatings and Application, Site Clean Up, All Incidental Work Necessary to Place the Tank into Operating Condition, Providing all Materials, Tools, Equipment and Labor Necessary to Paint the Exterior in Accordance with the Contract Documents, Complete in Place	1	LS	\$ _____	\$ _____
10	Sika-Flex 1a Caulking, Including Installation, Labor and Materials	5	Tube	\$ _____	\$ _____
11	Tank Mixing System Including, but not Limited to: Mixing System Components, Specified Tank Interior Surface Preparation as Required, Coatings and Application (if Required), Site Clean Up, all Electrical and Other Incidental Work Necessary to Provide a Fully Functional System, Providing all Materials, Tools, Equipment and Labor Necessary to Install the System in Accordance with the Contract Documents Section 11730, Complete in Place	1	LS	\$ _____	\$ _____
12	12" PVC, Class 200 Pipe, SDR-21, Furnishing, Trenching, Installing and Backfilling (Unclassified Excavation)	1,600	LF	\$ _____	\$ _____
13	12" CI AWWA NRS Gate Valve and Box, Conc. Pad, Complete in Place	6	EA	\$ _____	\$ _____
14	8" CI AWWA NRS Gate Valve and Box, Conc. Pad, Complete in Place	1	EA	\$ _____	\$ _____

15	12" x 6" Water Line Connection Including all Labor, Materials, Fittings, Gate Valves, Tapping Tees, Piping and any Other Appurtenances as Required, Complete in Place as Shown on Sheet 7 of the Plans and as Described in the Contract Documents	1	LS	\$ _____	\$ _____
16	20" Steel Casing Pipe by Open Cut, Furnishing and Installing Under State and County Maintained Roads, Including Unclassified Excavation (Water Pipe Not Included)	60	LF	\$ _____	\$ _____
17	Relocate Existing Fire Hydrant Complete in Place, Including Required Fittings and Appurtenances	1	LS	\$ _____	\$ _____
18	No. 10 Solid Copper Tracer Wire with Plastic Insulation and Sealed Splices to be Taped to the Top of all Water Mains, Complete in Place	1,600	LF	\$ _____	\$ _____
19	#57 Crushed Stone on Trench Surface, Full Depth on Driveways, Roadway Crossings	50	LF	\$ _____	\$ _____
20	#9-M Crushed Stone Bedding in Areas of Rock Excavation	50	TON	\$ _____	\$ _____
21	Bituminous Paving Replacement on State and County Maintained Roads and Driveways Including Gravel Backfill	10	LF	\$ _____	\$ _____
22	Concrete Paving Replacement, Including Gravel Backfill	10	LF	\$ _____	\$ _____
23	Control Valve and Vault, Compete in Place, Including all Required Labor and Materials, Fittings, Valves, Sump Pump, Electric Service, Unclassified Excavation and Appurtenances to Place into Service in Accordance with the Plans and Contract Documents	1	LS	\$ _____	\$ _____
24	Backflow Preventer and Vault, Compete in Place, Including all Required Labor and Materials, Fittings, Valves, 4" Drain Piping and Flap Valve, Unclassified Excavation and Appurtenances to Place into Service in Accordance with the Plans and Contract Documents	1	LS	\$ _____	\$ _____

- 25 Videotape Project Area, Including all Labor and Materials Required in Accordance with the Contract Documents      1      LS      \$ \_\_\_\_\_ \$ \_\_\_\_\_
  
- 26 Booster Pump Station Complete in Place, Including all Required Unclassified Excavation, Foundation, Electric Service, Backflow Preventer, Site Restoration, Access Road, Fittings, Valves and Appurtenances in Accordance with the Plans and Contract Documents      1      LS      \$ \_\_\_\_\_ \$ \_\_\_\_\_
  
- 27 SCADA SYSTEM  
 Furnish and Install all Required Labor and Materials, Including Unclassified Excavation, any Required Electrical Components or Upgrade, Mounting Boards/Brackets, Transducers, Wiring, Switches, etc. for a Complete and Fully Functional SCADA System Complete in Place, as Described in the Contract Documents and Shown on the Plans      1      LS      \$ \_\_\_\_\_ \$ \_\_\_\_\_

**TOTAL BID**      \$ \_\_\_\_\_  
 (Items 1 through 27)

The total sum of the Bid Items 1 through 27 shall be the basis upon which the Contract shall be awarded to the lowest responsive, responsible bidder. The BID amount shall be written both in words below and numerically above. In case of a discrepancy, amount shown in words will govern. THE BIDDER'S TOTAL SUM BASE BID FOR ITEMS 1 THROUGH 27 IS:

\_\_\_\_\_ DOLLARS

AND \_\_\_\_\_ CENTS (\$ \_\_\_\_\_ )

The OWNER reserves the right to, at his sole discretion, accept or reject any or all ALTERNATE BIDS to structure the project to his maximum advantage. Doing so will in no way impact or alter the evaluation of the BASE BID, which shall be the basis for Award of the Contract.

Base Bid Method of Payment shall be by lump sum based upon an approved estimated percentage complete of each bid item. Contractor should review the Standard Details and the Specifications, especially the Special Conditions, when bidding this project.

Upon request, the lowest responsive, responsible BIDDER may be allowed to submit a Schedule of Values upon Contract Award for approval by the ENGINEER/OWNER for any Lump Sum Bid Items as further basis for Measurement and Payment of that Item during construction.

The above prices shall include all labor, materials, excavation, permitting, shoring, removal, clean up, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for, complete in place.

\_\_\_\_\_  
(Bidder Firm Name) (Date)

By \_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Phone Number & E-mail)

\_\_\_\_\_  
(Business Address)

# 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):

Jessamine County Water District No.1  
2225 Lexington Road  
Nicholasville, KY 40356

**BID**

Bid Due Date: February 24, 2015  
Project (Brief Description Including Location):  
1,000,000 Gallon Elevated Tank  
Water System Improvements  
Jessamine County, KY

**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 FOR CONTRACTS, GRANTS AND LOANS

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

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

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

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

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

\_\_\_\_\_  
(name)

\_\_\_\_\_  
(date)

\_\_\_\_\_  
(title)

**U.S. DEPARTMENT OF AGRICULTURE**

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**Certification Regarding Debarment, Suspension, Ineligibility  
and Voluntary Exclusion - Lower Tier Covered Transactions**

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

**(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)**

- (1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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Organization Name

PR/Award Number or Project Name

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

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Signature(s)

Date

**Instructions for Certification**

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all lower tier covered transaction and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**USDA  
Form RD 400-6  
(Rev. 2-98)**

**COMPLIANCE STATEMENT**

This statement relates to a proposed contract with \_\_\_\_\_

Jessamine County Water District No. 1 – Water System Improvements, 1,000,000 Gallon Tank  
(Name of borrower or grantee)

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

1. I  have,  have not, participated in a previous contract or subcontract subject to Executive Order 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.
2. If I have participated in such a contract or subcontract, I  have,  have not, filed all compliance reports that I have been required to file in connection with the contract or subcontract.

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

3. I  have,  have not previously had contracts subject to the written affirmative action program requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract, I  have,  have not, developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

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

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

Position 6

**RD 400-6 (Rev. 2-98)**

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

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

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

*Date* \_\_\_\_\_

\_\_\_\_\_  
*Signature of Bidder or Prospective Contractor*

\_\_\_\_\_  
*Address (including Zip Code)*