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227 North Upper Street
Lexington, KY 40507-1016

Contract and Technical Specifications

**KY 1098 South Fork
Contract 1 – Waterline Extension
Breathitt County Water District
Jackson, Kentucky**

November, 2011

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Contract #1 – KY 1098 South Fork

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1.

SPECIFICATIONS

Breathitt County Water District (BCWD) plans to extend water service to currently unserved areas east of the City of Jackson. **The proposed project consists of installing potable waterlines and appurtenances along KY 1098 South Fork.** The **Base Bid project** includes approximately 17,000LF of 8-inch, 23,000LF of 6-inch, 14,000LF of 4-inch and 1,500 LF of 2-inch waterline. This proposed waterline extension project is planned to serve a maximum potential of approximately 123 **new residential customers.** Other major items of construction include: booster pump station modifications; telemetry, various stream crossings and roadway bore crossings.

Contract #1 – KY 1098 South Fork Waterline Extension

CDBG Grant No. # 10-026

Prepared for: **Breathitt County Water District**
1137 Main St
Jackson, KY 41339
606-666-3800 ext 250

Prepared by: **Nesbitt Engineering, Inc.**
227 North Upper Street
Lexington, Kentucky 40507
859-233-3111

2.

ADVERTISEMENT FOR BIDS

Breathitt County Water District
1137 Main Street
Jackson, KY 41339

Sealed bids for: **KY 1098 South Fork Waterline; Contract #1 Waterline** will be received by **Breathitt County Water District** at the **Breathitt County Court Room**, until **November 21, 2011; 1:00 o'clock (P.M., E.D.T.)**, and then at said office publicly opened and read aloud.

Project consists of the installation of approx 10 miles of 8, 6, 4, and 2 inch PVC waterlines and approximately 123 residential service meters.

The Plans and Specifications and other contract documents may be examined at the following locations:

Breathitt County Water District
1137 Main Street
Jackson, KY 41339

Builders Exchange
1035 Strader Dr Suite 100
Lexington, KY 40505

AGC / F.W. Dodge Corporation
950 Contract St Suite 100
Lexington, Kentucky 40505

Copies may be obtained at the office of **Lynn Imaging, Inc.**, located at **328 East Vine Street, Lexington, KY 40507, 859-255-1021**, upon payment of **\$250.00** non refundable for each set. The owner reserves the right to waive any informality or to reject any or all bids.

Each bidder must deposit his bid security in the amount, form and subject to the conditions provided in the Information for Bidders.

This contract will be funded in part with a Kentucky Infrastructure Authority FADWSRF Loan, Community Development Block Grant, Coal Severance Funds and/or other funding agencies. Bidders must comply with Title VI of the Civil Rights Act of 1964, the Anti-Kickback Act, Non segregated facilities order 32FR 7439, and the Contract Work Hours Standard Act. This project will be in compliance with, and bidders must comply with Executive Order No. 11246 (EEO) as amended, prohibiting discrimination in employment regarding race, creed, color, sex or national origin. Contractors/subcontractors will comply with 41 CFR 60-4, (affirmative action), to insure equal opportunity to females and minorities and will apply the time tables and goal set forth in 41 CFR 60-4. This contract is subject to state and federal wage rates. Bidders will make positive efforts to use small, minority, women owned and disadvantaged businesses. DBE's are encouraged to bid. This procurement will be subject to regulations contained in 40 CFR 31.36 or with DOW Procurement Guidance in reference to the Davis-Bacon Act, Section 109 and Section 3.

No bidder may withdraw his bid within **90** days after the actual date of the opening thereof. Bid award will be made to the lowest, responsive, responsible bidder.

November 10, 2011
(Date)

Bobby Thorpe, Jr Chairman BCWD

"EQUAL EMPLOYMENT OPPORTUNITY"

3.

INFORMATION FOR BIDDERS

1. **Receipt and Opening of Bids:** The **Breathitt County Water District (BCWD)** (herein called the "Owner"), invites bids on the form attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the office of **Breathitt County Court House** until **1:00 p.m., Local Time, November 21, 2011**, and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed to **Mr. Bobby Thorpe, Jr, Chairman Breathitt County Water District, at Breathitt County Courthouse, 1137 Main Street, Jackson, Kentucky 41339**, and designated as bid for **Contract #1 – KY 1098 South Fork Waterline Extensions**.

- a. The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities 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 date of the opening thereof.

2. **Preparation of Bid:** Each bid must be submitted on the prescribed form and accompanied by Certification of Bidder Regarding Equal Employment Opportunity, Form 950.1; Certification of Bidder (Contractor) Concerning Labor Standards and Prevailing Wage Requirements, Form 1421; Certification of Bidder Regarding Section 3 and Segregated Facilities; and Contractor Eligibility Certification Regarding Debarment, Suspension and Other Responsibilities. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures, and the foregoing Certifications must be fully completed and executed when submitted.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his/her address, 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 as specified in the bid form.

3. **Subcontracts:** The bidder is specifically advised that any person, for, or other party to whom it is proposed to award a subcontract under this contract:
 - a. Must be acceptable to the Owner and have current eligibility status for federal programs; and
 - b. Must submit Form 950.2, Certification by Proposed Subcontractor Regarding Equal Employment Opportunity, Certification of Proposed Subcontractor Regarding Section 3 and Segregated Facilities, and Subcontractor Eligibility Certification Regarding Debarment, Suspension and Other Responsibilities. Approval of the proposed subcontract award cannot be given by the Owner unless and until the proposed subcontractor has submitted the Certifications and/or other evidence showing that it has fully complied with any reporting

requirements to which it is or was subject. Although the bidder is not required to attach such Certifications by proposed subcontractors to his/her bid, the bidder is here advised of this requirement so that appropriate action can be taken to prevent subsequent delay in subcontract awards.

4. Telegraphic/Facsimile Modification: Any bidder may modify his/her bid by telegraphic or facsimile communication at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the Owner prior to the closing time, and provided further, the Owner is satisfied that a written confirmation of the telegraphic/facsimile modification over the signature of the bidder was mailed prior to the closing time. The communication should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened. If written confirmation is received within two days from the closing time, no consideration will be given to the telegraphic/facsimile modification.
5. Method of Bidding: The Owner invites the following bid(s):
 - a. Contract #1 – Unit price per Bid Schedule
Installation of 8, 6, 4, and 2 inch waterlines.
6. Qualifications of Bidder: The Owner may make such investigations as s/he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.
7. Bid Security: Each bid must be accompanied by cash, certified check of the bidder, or a bid bond prepared on the Bid Bond Form attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of 5% of the bid. Such cash, checks or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract, or if no award has been made within 90 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he/she has not been notified of the acceptance of his/her bid.
8. Liquidated Damages for Failure to Enter into Contract: The successful bidder, upon his/her failure or refusal to execute and deliver the contract and bonds required within 10 days after s/he has received notice of the acceptance of his/her bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his/her bid.
9. Time of Completion and Liquidated Damages: Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within 210 consecutive calendar days thereafter. Bidder must agree also to pay as liquidated damages, the sum of \$750.00 for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

10. Conditions of Work: Each bidder must inform him/herself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his/her obligation to furnish all material and labor necessary to carry out the provisions of his/her contract. Insofar as possible, the contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.
11. Addenda and Interpretations: No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to **Nesbitt Engineering, Inc., 227 North Upper Street, Lexington, Kentucky 40507** and to be given consideration must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his/her bid as submitted. All addenda so issued shall become part of the contract documents.

12. Security for Faithful Performance: Simultaneously with his/her delivery of the executed contract, the contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner.
13. Power of Attorney: Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.
14. Notice of Special Conditions: Attention is particularly called to those parts of the contract documents and specifications which deal with the following:
- a. Inspection and testing of materials.
 - b. Insurance requirements.
 - c. Wage rates.
 - d. Stated allowances.
15. Laws and Regulations: The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written in full.
16. Method of Award - Lowest Qualified Bidder: If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the

amount of funds then estimated by the Owner as available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible alternates applied in numerical order in which they are listed in the Form of Bid, as produces a net amount which is within the available funds. If all bids exceed funds available to finance the contract once all deductive alternatives have been applied, the owner may negotiate price with the bidder who is lowest at that point.

17. Obligation of Bidder: At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect of his/her bid.
18. Safety Standards and Accident Prevention: With respect to all work performed under this contract, the contractor shall:
 - a. Comply with the safety standards provisions of applicable Laws, building and construction codes and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596), and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register", Volume 36, No.75, Saturday, April 17, 1971.
 - b. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
 - c. Maintain at his/her office or other well known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

4.

BID BOND FORM

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____ as Principal, and _____ as
Surety, are hereby held and firmly bound unto _____ as owner
in the penal sum of _____ for the payment of which, well and truly
to be made, we hereby jointly and severally bind ourselves, our heirs, executors,
administrators, successors and assigns. Signed this _____ day of _____
_____, 20____.

The Condition of the above obligation is such that whereas the Principal has submitted to
_____ a certain Bid, attached hereto and hereby made a part
hereof to enter into a contract in writing, for the _____

Now, THEREFOR,

- (a.) If said Bid shall be rejected, or in the alternate.
- (b.) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety, and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal

Surety

SEAL

By: _____

5.

BID FOR UNIT PRICE CONTRACTS

Place Breathitt County

Date _____

Project No. NEI 998-27

Proposal of _____ (hereinafter called "Bidder")* a corporation organized and existing under the laws of state of _____* a partnership, or an individual doing business as _____

To the **Breathitt County Water District** hereinafter called "Owner")

Gentlemen:

The Bidder, in compliance with your invitation for bids for the construction of **Contract #1 – KY 1098 South Fork Waterline Extension**

Having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposal project including the availability of materials and labor, hereby processes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in written "Notice to Proceed" of the Owner and to fully complete the project within 210 consecutive calendar day thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages, the sum of \$ 750 for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

Bidder acknowledges receipt of the following addendum:

*Insert corporation, partnership or individual as applicable.

Bidder agrees to perform all the work described in the specifications and shown on the plans, for the following unit prices:

***SEE ATTACHED BID SCHEDULE**

(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

The above unit prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

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.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required by Paragraph 29 of the General Conditions. The bid security attached in the sum of _____ (\$ _____) is to become the property of the Owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully submitted:

By _____
(Title)

(SEAL – if bid is by a corporation)

(Business Address and Zip Code)

BIDDER'S QUALIFICATIONS

Name of BIDDER: _____

The BIDDER'S Qualifications as required by the OWNER to be submitted are set forth herewith:

1. A permanent place of business is maintained at:

2. The following construction plant and equipment will be made available for use on this contract: (use additional pages if necessary)

3. Financial condition:

Each BIDDER is required to submit its three (3) years audited financial statements to the OWNER at the time of the BID opening, in a separate sealed envelope with the BID, and clearly identified. The OWNER will keep the financial data of the three lowest BIDDERS and immediately return unopened, all other financial data submittals. The OWNER will, to the extent permitted by law, keep the BIDDERS' financial data confidential, using it only as needed to determine BIDDER'S qualifications.

4. In the event Contract is awarded to the undersigned, surety BONDS will be furnished by:

(Surety Company)

Signed (Representative)

5. Experience of BIDDER on other similar work: (use additional pages if necessary)

6. We now have the following jobs under contract and bonded: (Note - List all construction now under contract.)

Job	Location	Percent Complete	Total Contract
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>

7. We acknowledge that if we are the apparent low BIDDER, we will submit to the OWNER within ten (10) calendar days following the bid opening, our latest five (5) year loss history and insurance claim history, including, but not limited to, losses arising from general liability, errors and omissions/malpractice, vehicle liability, Workmen's Compensation, property damage, contract liability and any other coverages required by this contract, a sworn statement on the OWNER'S form of the experience of our officers, office management and field management personnel, all in accordance with the Special Conditions of the project SPECIFICATIONS and BID Documents.

 (CONTRACTOR)

By: _____

Title: _____

Date: _____

MAJOR SUBCONTRACTOR LISTING

BIDDING CONTRACTOR: _____

Note: This form must be completely filled in by BIDDING CONTRACTORS. If no SUBCONTRACTOR is to be used on a listed item, write in the word "None" opposite the item.

<u>No.</u>	<u>Subcontractor Name and Address, Phone No., Contact</u>
1.	Type Work: _____ Dollar Amount: \$ _____
2.	Type Work: _____ Dollar Amount: \$ _____
3.	Type Work: _____ Dollar Amount: \$ _____
4.	Type Work: _____ Dollar Amount: \$ _____
5.	Type Work: _____ Dollar Amount: \$ _____

Signature _____
(BIDDING CONTRACTOR)

Title _____

Date _____

RD Instruction 1940-Q

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)

(08-21-91) PN 171

Breathitt County Water District					
Bid Schedule - Base Bid					
Contract #1 - KY 1098 South Fork Waterline Extension					
Item No.	Description	Unit	Quantity	Unit Price	Total Cost
1	Tie Into Existing Waterline	LS	1	\$	\$
2	Air Relief Valve & Box	EA	2	\$	\$
3	8" DR 14 PVC Waterline	LF	16,750	\$	\$
4	6" DR 14 PVC Waterline	LF	22,250	\$	\$
5	4" DR 18 PVC Waterline	LF	3,000	\$	\$
6	4" DR 14 PVC Waterline	LF	10,500	\$	\$
7	2" DR 14 PVC Waterline	LF	1,250	\$	\$
8	2" SDR 17 PVC Waterline	LF	250	\$	\$
9	8" D.I.M.J. Gate Valve & Box	EA	8	\$	\$
10	6" D.I.M.J. Gate Valve & Box	EA	13	\$	\$
11	4" D.I.M.J. Gate Valve & Box	EA	8	\$	\$
12	Flushing Hydrant Assembly	EA	13	\$	\$
13	Post Hydrant Assembly, Blow off	EA	6	\$	\$
14	Creek Crossing, 10" HDPE Directional Drilled	LF	367	\$	\$
15	Creek Crossing, 8" HDPE Directional Drilled	LF	180	\$	\$
16	Creek Crossing, 6" HDPE Directional Drilled	LF	165	\$	\$
17	Hwy Xing, Bore & Jack w. 14" Steel Casing	LF	66	\$	\$
18	5/8 x 3/4 Indiv. Meters (Radio Read Profiler w/ iprv)	EA	80	\$	\$
19	5/8 x 3/4 Indiv. Meters (Radio Read Profiler w/o iprv)	EA	43	\$	\$
20	3/4" Polyethylene cl 200 service line	LF	9,225	\$	\$
21	1" Polyethylene cl 200 service line	LF	250	\$	\$
22	Leak Detection Assembly, Type A	EA	1	\$	\$
23	Waterline Marker	EA	20	\$	\$
24	KY 30 Booster Station Improvements	LS	1	\$	\$
25	New Telemetry & Telemetry Improvements	LS	1	\$	\$
26	New Telemetry Repeater Stations	LS	1	\$	\$
27	Check Valve Assembly Vault	EA	2	\$	\$
	Total Base Bid - (items numbered 1 - 27) =			\$	
	Total Base Bid (written) =				
				dollars	cents

Note:

No change in material and/or equipment approved prior to bids being received. Materials/equipment shall be bid as specified in specifications and plans. Any claim for price increase due to the contractor bidding a different material/equipment will be denied.

6.

BID FOR LUMP SUM CONTRACTS

Not Used

8.

CERTIFICATION OF BIDDER REGARDING SECTION 3 AND SEGREGATED FACILITIES

Name of Prime Contractor

Project Name

Project Number

The undersigned hereby certifies that:

- a) Section 3 provisions are included in the Contract.
- b) A written Section 3 plan was prepared and submitted as part of the bid proceedings (if bid exceeds \$100,000).
- c) No segregated facilities will be maintained

Name & Title of Signer (print or type)

Signature

Date

9.

**CONTRACTOR SECTION 3 PLAN FORMAT
(if bid exceeds \$100,000)**

_____ (name of contractor _____) agrees to implement the following specific affirmative action steps directed at increasing the utilization of lower income residents and businesses within the City of _____.

- A. To ascertain from the locality's CDBG program official the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.
- B. To attempt to recruit from within the city the necessary number of lower income residents through: Local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within or serving the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan, or the U.S. Employment Service.
- C. To maintain a list of all lower-income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents, and to require all bidders on subcontracts to submit a Section 3 affirmative action plan including utilization goals and the specific steps planned to accomplish these goals. *
- E. To insure that subcontract which are typically let on a negotiated rather than a bid basis in areas other than Section 3 covered project areas, are also let on a negotiated basis, whenever feasible, when let in a Section 3 covered project area. *
- F. To formally contact unions, subcontractors and trade associations to secure their cooperation for this program.
- G. To insure that all appropriate project area business concerns are notified of pending subcontractual opportunities.
- H. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken.
- I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 plan.
- J. To list on Table A, information related to subcontracts to be awarded.
- K. To list on Table B, all projected workforce needs for all phases of this project by occupation, trade, skill level and number of positions.

* Loans, grants, contracts and subsidies for \$100,000 or less than \$100,000 will be exempt.

As officers and representatives of _____
(Name of Contractor)

We the undersigned have read and fully agree to this Affirmative Action Plan, and become a party to the full implementation of this program.

Signature

Title

Date

Signature

Title

Date

CONTRACTOR SECTION 3 PLAN FORMAT continued

ESTIMATED PROJECT WORKFORCE BREAKDOWN
 TABLE B

Column 1	Column 2	Column 3	Column 4	Column 5
JOB CATEGORY	TOTAL ESTIMATE POSITIONS	NO. POSITIONS CURRENTLY OCCUPIED BY PERMANENT EMPLOYEES	NO. POSITIONS NOT CURRENTLY OCCUPIED	NO. POSITIONS TO BE FILLED WITH L.I.P.A.R*
OFFICERS SUPERVISORS PROFESSIONALS				
TECHNICIANS				
HOUSING SALES RENTAL/MANAGEMENT				
OFFICE CLERICAL				
SERVICE WORKERS				
OTHERS				

TRADE:

JOURNEYMEN				
HELPERS				
APPRENTICES				
MAXIMUM NO. TRAINEES				
OTHERS				

TRADE:

JOURNEYMEN				
HELPERS				
APPRENTICES				
MAXIMUM NO. TRAINEES				
OTHERS				

TRADE:

JOURNEYMEN				
HELPERS				
APPRENTICES				
MAXIMUM NO. TRAINEES				
OTHERS				

* Lower income Project Area residents. Individuals within the City/County of _____ whose family income does not exceed 90% of the median income in the SMSA.

 Company

10.

**CERTIFICATION BY PROPOSED SUBCONTRACTOR
 REGARDING EQUAL EMPLOYMENT OPPORTUNITY**

CERTIFICATION BY PROPOSED SUBCONTRACTOR REGARDING EQUAL EMPLOYMENT OPPORTUNITY	
Name of Prime Contractor	Project Number
Instructions	
<p>This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The Implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause, and if so, whether it has filed all compliance reports due under applicable instructions.</p> <p>Where the certification indicates that the subcontractor has not filed a compliance report due under applicable instructions, such subcontractor shall be required to submit a compliance report before the owner approves the subcontract or permits work to begin under the subcontract.</p>	
Subcontractor's Certification	
Name and Address of Subcontractor (include zip code)	
1. Subcontractor has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. Yes___ No___	
2. Compliance reports were required to be filled in connection with such contract or subcontract. Yes___ No___	
3. Subcontractor has filed all compliance reports due under applicable instructions, including Monthly Employment Utilization Report (257) Yes___ No___ None Required___	
4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended? Yes___ No___	
Name and Title of Signer (please type)	
Signature	Date

11.

**CERTIFICATION OF PROPOSED SUBCONTRACTOR REGARDING
SECTION 3 AND SEGREGATED FACILITIES**

Name of Subcontractor

Project Name

Project Number

The undersigned hereby certifies that:

- (a) Section 3 provisions are included in the Contract.
- (b) A written Section 3 plan was prepared and submitted as part of the bid proceedings (if bid exceeds \$100,000).
- (c) No segregated facilities will be maintained as required by Title VI of the Civil Rights Act of 1964.

Name & Title of Signer (print or type)

Signature

Date

12.

**CONTRACTOR'S CERTIFICATION CONCERNING
 LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS**

CONTRACTOR'S CERTIFICATION CONCERNING
 LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS

TO (Appropriate Recipient):	DATE
C/O	PROJECT NUMBER (if any)
	PROJECT NAME

1. The undersigned, having executed a contract with _____ for the construction of the above identified project, acknowledges that:

- (a) The Labor Standards provisions are included in the aforesaid contract;
- (b) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, is his responsibility.

2. He certifies that:

- (a) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by the Comptroller of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor., Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended (40 U.S. C. 276a-2(a)).
- (b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designed as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors and any lower tier subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractors.

4. He certifies that:

- (a) The legal name and the business address of the undersigned are:

- (b) The undersigned is:

(1) A SINGLE PROPRIETORSHIP	(3) A CORPORATION ORGANIZED IN THE
-----------------------------	------------------------------------

	STATE OF:
(2) A PARTNERSHIP	(4) OTHER ORGANIZATION (Describe)

(c) The name, title and address of the owner, partners, or officers of the undersigned are:

NAME	TITLE	ADDRESS

(d) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are (if none, so state)

NAME	ADDRESS	NATURE OF INTENT

(e) The names, addresses and trade classifications of all other building construction contractors in which undersigned ha a substantial interest (if none, so state):

NAME	ADDRESS	TRADE CLASSIFICATION

Date _____ (Contractor)

By: _____

WARNING

U.S. Criminal Code, Section 1010, Title 18, U.S. C., provides in part: "Whoever makes, passes, utters, or publishes any statement knowing the same to be false..... shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

**SUBCONTRACTOR'S CERTIFICATION CONCERNING
 LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS**

SUBCONTRACTOR'S CERTIFICATION CONCERNING
 LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS

TO (Appropriate Recipient):	DATE
C/O	PROJECT NUMBER (if any)
	PROJECT NAME

1. The undersigned, having executed a contract with _____ for the construction of the above identified project, acknowledges that:

(c) The Labor Standards provisions are included in the aforesaid contract;

(d) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, is his responsibility.

2. He certifies that:

(c) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by the Comptroller of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor., Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended (40 U.S. C. 276a-2(a)).

(d) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designed as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors and any lower tier subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractors.

4. He certifies that:

(f) The legal name and the business address of the undersigned are:

(g) The undersigned is:

(1) A SINGLE PROPRIETORSHIP	(3) A CORPORATION ORGANIZED IN THE STATE OF:
(2) A PARTNERSHIP	(4) OTHER ORGANIZATION (Describe)

(h) The name, title and address of the owner, partners, or officers of the undersigned are:

NAME	TITLE	ADDRESS

(i) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are (if none, so state)

NAME	ADDRESS	NATURE OF INTENT

(j) The names, addresses and trade classifications of all other building construction contractors in which undersigned ha a substantial interest (if none, so state):

NAME	ADDRESS	TRADE CLASSIFICATION

Date _____ (Contractor)

By: _____

WARNING

U.S. Criminal Code, Section 1010, Title 18, U.S. C., provides in part: "Whoever makes, passes, utters, or publishes any statement knowing the same to be false..... shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

SAMPLE CONTRACTOR EMPLOYEE BREAKDOWN

EXECUTIVE ORDER 11246

To Be Completed by the Contractor

Complete information on all employees expected to work on this contract.

Employee Name Race Sex Job Classification Salary/ Wage Rate

Certification:

I (will/will not) be hiring additional employees for work on this project. For all hiring that does occur, I will comply with the minority and female employment goals specified in the contract.

Signature

Title

Date

**CONTRACTOR ELIGIBILITY CERTIFICATION REGARDING DEBARMENT,
SUSPENSION AND OTHER RESPONSIBILITY
(Primary Transactions)**

- _____ 1. I hereby certify, the best of my knowledge and belief, that I and my principals:
- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency;
 - b. Have not within a three-year period preceding this certification been convicted of or had a civil judgement rendered for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1) (b) of this certification; and
 - d. Have not within a three-year period preceding this certification had one or more public transactions (Federal, State or local) terminated for cause or default.
- _____ 2. I am unable to certify to any of the statements in this certification and an explanation is hereby attached.

Typed or Printed Name of Principal

Title, Role or Capacity

Signature of Principal

Date

12a. NOTICE OF AWARD

TO:

PROJECT Description: Contract - #1 KY 1098 South Fork Waterline Project

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated November 10, 2011, and Information for Bidders.

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

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

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

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

Dated this _____ day of _____, 20_____.

Breathitt County Water District

By _____
Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

By _____ this the _____ day of _____,
20_____.

By _____

Title _____

13.

CONTRACT FORM

THIS AGREEMENT, made this _____ day of _____, 20____, by and between
Breathitt County Water District (BCWD), Herein called "Owner,"
(Corporate Name of Owner)

herein through its **Contract #1 – KY 1098 South Fork Waterline Project**, and

_____ (a corporation) _____ (a partnership)
IN APPLICABLE (an individual doing business as _____)
TERMS _____

Of _____, County of _____, and State of **Kentucky** hereinafter
called "Contractor"

WITNESSETH: That for and in consideration of the payments and agreements hereinafter
mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the
OWNER to commence and complete the construction as described as follows:

hereinafter called the project, for the sum of _____ (\$ _____) and all
extra work in connection therewith, under the terms as stated in the General and Special Conditions
of the Contract; and at his (its or their) own proper cost and expense to furnish all the materials,
supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and
services necessary to complete the said project in accordance with the conditions and prices stated in
the Proposal, the General Conditions, Supplemental General Conditions and Special Conditions of
the Contract, the plans, which include all maps, plats, blue prints and other drawings and printed or
written explanatory matter thereof, the specifications and contract documents therefore as prepared
by **Nesbitt Engineering, Inc.** herein entitled the ENGINEER, and as enumerated in Paragraph 1 of
the Supplemental General Conditions, all of which are made a part hereof and collectively evidence
and constitute the contract.

The Contractor hereby agrees to commence work under this contract on or before a date to
be specified in written "Notice to Proceed" of the OWNER and to fully complete the project within
210 consecutive calendar days thereafter. The Contractor further agrees to pay, as liquidated
damages, the sum of **\$ 750.00** for each consecutive calendar day thereafter as hereinafter provided
in Paragraph 19 of the General Conditions.

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the
contract, subject to additions and deductions, as provided in the General Conditions of the Contract,
and to make payments on account thereof as provided in Paragraph 25, "Payments to Contractor," of
the General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in six (6) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

(Seal)
ATTEST

Breathitt County Water District
(Owner)

(Secretary)

By _____
Bobby Thorpe, Jr

(Witness)

Chairman
(Title)

(Seal)

(Contractor)

(Secretary)

By _____

(Witness)

(Title)

(Address and Zip Code)

NOTE: Secretary of the Owner should attest. If Contractor is a corporation, Secretary should attest.

13a.
NOTICE TO PROCEED

TO: _____

DATE:

Project:

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 2010, on or before _____, 20____, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 20_____.

Breathitt County Water District

By _____
Chairman

ACCEPTANCE OF NOTICE
Receipt of the above NOTICE TO PROCEED is hereby acknowledged by

this the _____, 20_____

By _____

Title _____

Employer Identification

Number _____

oOo

14.

BONDING REQUIREMENTS

Construction project bids estimated to exceed \$25,000 must include bidder security. An acceptable form of bidder security is a bid guarantee from each bidder equivalent to five percent of the bid price. The "bid guarantee" shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his/her bid, execute such contractual documents as may be required within the time specified.

Construction contracts or subcontracts exceeding \$25,000 must include:

- a. A performance bond on the part of the contractor for 100 percent of the contract price as it may be increased. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.
- b. A payment bond on part of the contractor for 100 percent of the contract price. A "payment bond" is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

PERFORMANCE BOND

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

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

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:
Amount:
Description (*Name and Location*):

BOND

Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

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.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 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
 - 2.2 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 2.1; and
 - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
 1. Surety in accordance with the terms of the Contract; or
 2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
 - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 3.3 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 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 3.4 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.
4. If Surety does not proceed as provided in Paragraph 3 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 3.4, 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.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 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 the 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:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. 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.

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

8. 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.

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

10. 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.

11. Definitions.

- 11.1 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.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 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 otherwise 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*): _____

CONTRACT

Effective Date of Agreement:
Amount:
Description (*Name and Location*):

BOND

Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

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 address 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 (at the address described in Paragraph 12) 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 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 otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other*):

15.

CERTIFICATE OF OWNER’S ATTORNEY

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

I have examined the attached contract(s) and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements 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 terms, conditions and provisions thereof.

Signature

Date

16.

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GENERAL CONDITIONS Including Federal Labor Standards Provisions

1. Contract and Contractor Documents

The project to be constructed and pursuant to this Contract will be financed with assistance from the Kentucky Community Development Block Grant Program and is subject to all applicable Federal laws and regulations.

The plans, specifications and addenda, hereinafter enumerated in Paragraph 1 of the Supplemental General Conditions on page 30, shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.

2. Definitions

The following terms as used in this contract are respectively defined as follows:

- (a) "Contractor": A person, firm or corporation with whom the contract is made by the Owner.

- (b) "Subcontractor": A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with, the Contractor.

- (c) "Work on (at) the project": Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Prime Contractor and any Subcontractor.

3. Additional Instructions and Detail Drawings

The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Architect/Engineer will prepare jointly (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of show drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work; each such schedule to be subjected to change from time to time in accordance with the progress of the work.

4. Shop or Setting Drawings

The Contractor shall submit promptly to the Architect/Engineer two copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with two corrected copies. If requested by the Architect/Engineer the Contractor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer, the Contractor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the plans and specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

5. Materials, Services and Facilities

(a) It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature and all other services and facilities of every nature whatsoever necessary to execute, complete and deliver the work within the specified time.

(b) Any work necessary to be performed after regular working hours, on Sunday or Legal Holidays, shall be performed without additional expense to the Owner.

6. Contractor's Title to Materials

No materials or supplies for the work shall be purchased by the Contractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

7. Inspection and Testing of Materials

(a) All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The Owner will pay for all laboratory inspection service direct, and not as a part of the Subcontract.

(b) Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

8. "Or Equal" Clause

Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and, any materials, article or equipment of other manufacturers and vendors which will perform adequately to the duties imposed by the general design will be considered equally acceptable provided the material, article or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor without the Architect/Engineer's written approval.

9. Copyrights and Patents

- (a) The Contractor shall hold and save the Owner and its officers, agents, servants and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of the Contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.
- (b) License or Royalty Fees: License and/or royalty fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the Contractor.
- (c) If the contractor uses any design, device or materials covered by letters, patent or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. If is mutually agreed and understood, that without exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any say involved in the work. The Contactor and/or his Sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this Contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.
- (d) Any copyrightable work resulting from this Agreement is available to the author for such, but the City and the Kentucky Department for Local Government reserve the option for unlimited use and license to such work. Any discovery or invention shall be reported promptly to the City and the Kentucky Department for Local Government for the determination as to whether patent protection should be sought and how the rights of any patent shall be disposed of and administered in order to protect the public interest.

10. Surveys, Permits and Regulations

Unless otherwise expressly provided for in the specifications, the Owner will furnish the Contractor all surveys necessary for the execution of the work.

The Contractor shall procure and pay all permits, licenses and approvals necessary for the execution of this Subcontract.

The Contractor shall comply with all laws, ordinances, rules, orders and regulations relating to performance of the work, the protection of adjacent property and the maintenance of passageways, guard fences or other protective facilities.

11. Contractor's Obligations

The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this Contract, within the time herein specified, in accordance with the provisions of this Contract and said specifications and in accordance with the plans and drawings covered by this Contract any and all supplemental plans and drawings, and in accordance with the directions of the Contractor and/or Architect/Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required.

The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitations of the Contract and specifications, and shall do, carry on and complete the entire work to the satisfaction of the Contractor, Architect/Engineer and the Owner.

12. Weather Conditions

In the event of temporary suspension of work, or during inclement weather, or whenever the Architect/Engineer shall direct, the Contractor will, and will cause his Subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Architect/Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors to protect his work, such materials shall be removed and replaced at the expense of the Contractor.

13. Protection of Work and Property – Emergency

The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this Contract. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the Contract or by the Owner, or his duly authorized representatives.

In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Architect/Engineer, in a diligent manner. He shall notify the Architect/Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Architect/Engineer for approval.

Where the Contractor has not taken action but has notified the Architect/Engineer of an emergency threatening injury to persons or damage to the work or any adjoining property, he shall act as instructed or authorized by the Architect/Engineer.

The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Paragraph 17 of the General Conditions.

14. Inspection

The authorized representatives and agents of the Kentucky Department of Local Government and the Department of Housing and Urban Development shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials and other relevant data and records.

15. Reports, Records and Data

The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this Contract.

16. Superintendence by Contractor

At the site of the work the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Architect/Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll.

17. Changes in Work

No changes in the work covered by the approved Contract Documents shall be made without having prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

- (a) Unit bid prices previously approved.
- (b) An agreed lump sum.
- (c) The actual cost of
 1. Labor, including foremen.
 2. Materials entering permanently into the work.
 3. The ownership or rental cost of construction plant and equipment during the time of use on the extra work.
 4. Power and consumable supplies for the operation of power equipment.
 5. Insurance.
 6. Social Security and old age and unemployment contributions.

18. Extras

Without invalidating the Contract, the Owner may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the Surety being first obtained where necessary or desirable. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the Owner or its Architect/Engineer, acting officially for the Owner, and the price is stated in such order.

19. Time for Completion and Liquidated Damages

It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this Contract; and it is further mutually understood and agreed that the work embraced in this Contract shall be commended on a date to be specified in the "Notice to Proceed".

The Contractor agrees that said work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as part consideration for the awarding of this Contract, to pay to the Owner the amount specified in the Contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; provided, further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

- (a) To any preference, priority or allocation order duly issued by the Government.
- (b) To unforeseeable cause beyond the control and without fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and severe weather.
- (c) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article.

Provided, further, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the Contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain in the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

20. Correction of Work

All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the Contractor at his own expense. Rejected materials shall immediately be removed from the site. If, in the opinion of the Architect/Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.

21. Subsurface Conditions Found Different

Should the Subcontractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the plans or indicated in the specifications, he shall immediately give notice to the Architect/Engineer of such conditions before they are disturbed. The Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the plans or indicated in the specifications he will at once make such changes in the plans and/or specifications as he may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

22. Claims for Extra Cost

No claim for extra work or associated cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the Owner, as aforesaid and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17(c) of the General Conditions, the Subcontractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

23. Right of Owner to Terminate Contract

In the event that any of the provisions of this Contract are violated by the Contractor, or by any of his Subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate the Contract, such notices to contain the reasons for such intention to terminate the Contract, and unless within ten (10) days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of correction be made, the Contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the Surety and the Contractor and the Surety shall have the right to take over and perform the Contract; provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion by contract or by force account for the account and at the expense of the Contractor and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned by the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances and plant as may be on the site of the work and necessary therefore.

The Owner may terminate this Contract at any time by giving at least ten (10) days notice in writing to the Contractor. If the Contract is terminated by the Owner as provided herein, the Contractor will be paid for the time provided and expenses incurred up to the termination date. If the Contract is terminated due to the fault of the Contractor, the above paragraph relative to termination shall apply.

24. Construction Schedule and Periodic Estimates

Immediately after execution and delivery of the Contract, and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish on forms to be supplied by the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

25. Payments to the Contractor

- (a) Not later than the **30th** day of each calendar month the Owner shall make a progress payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this Contract, but to insure the proper performance of this Contract, the Owner shall retain ten percent (10%) of the amount of each estimate until final completion and acceptance of all work covered by this Contract; provided, that the Contractor shall submit his estimate

not later than the 5th day of the month; provided, further, that on completion and acceptance of each separate building, public work, or other division of the Contract, on which the price is stated separately in the Contract, payment may be made in full, including retained percentages thereon, less authorized deductions.

- (b) In preparing estimates the material delivered on the site and preparatory work done may be taken into consideration.
- (c) All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all of the terms of the Contract.
- (d) Owner's Right to Withhold Certain Amounts and Make Application Thereof: The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, material men and furnishers of machinery and parts thereof, equipment, power tools and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged or waived. If the Contractor fails to do so, then the Owner may, after having served written notice on the said Contractor, either pay unpaid bills, of which the Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of this Contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor or his Surety. In paying any unpaid bills of the Contractor, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the Contract by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

26. Acceptance of Final Payment Constitutes Release

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor or his Sureties from any obligations under this Contract or the performance and payment bond.

27. Payments by Contractor

The Contractor shall pay (a) for all transportation and utility services not later than the 30th day of the calendar month following that in which services are rendered, (b) for all materials, tools and other expendable equipment to the extent of ninety percent (90%) of

the cost thereof, not later than the 10th day of the calendar month following that in which such materials, tools and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools and equipment are incorporated or used, and (c) to each of his Subcontractors, not later than the 10th day following each payment to the Contractor, the respective amount allowed the Contractor on account of the work performed by his Subcontractors to the extent of each Subcontractor's interest therein.

28. Insurance

The Contractor shall not commence work under this Contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on this subcontract until the insurance required of the Subcontractor has been so obtained and approved.

- (a) Compensation Insurance: The Contractor shall procure and shall maintain during the life of this Contract Workmen's Compensation Insurance as required by applicable State or territorial law for all of his employees to be engaged in work at the site of the project under this Contract, and, in case of any such work sublet, the Contractor shall require the Subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workmen's Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this Contract is not protected under the Workmen's Compensation Statute, the Contractor shall provide and shall cause each Subcontractor to provide adequate employer's liability insurance for the protection of such of his employees as are not otherwise protected.
- (b) Contractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall procure and maintain during the life of this Contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in the amounts specified in Supplemental General Conditions.
- (c) Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall either (1) require each of his Subcontractors to procure and to maintain during the life of his subcontract Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in the Supplemental General Conditions specified in subparagraph (B) hereof, or (2) insure the activities of his policy, specified in subparagraph (b) hereof.
- (d) Scope of Insurance and Special Hazards: The insurance required under subparagraphs (b) and (c) hereof shall provide adequate protection for the Contractor and his Subcontractors, respectively, against damage claims which may arise from operations under this Contract, whether such operations be by the insured or by anyone directly or indirectly employed by

him and, also against any of the special hazards which may be encountered in the performance of this Contract as enumerated in the Supplemental General Conditions.

- (e) Builder's Risk Insurance (Fire and Extended Coverage): Until the project is completed and accepted by the Owner, the Owner or Contractor (at the Owner's option as indicated in the Supplemental General Conditions. Form HUD-4238-N) is required to maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portion of the project for the benefit of the Owner, the Contractor, and Subcontractors as their interests may appear. The Contractor shall not include any costs for Builder's Risk Insurance (fire and extended coverage) premiums during construction unless the Contractor is required to provide such insurance, however, this provision shall not release the Contractor from his obligation to complete, according to plans and specifications, the project covered by the Contract, and the Contractor and his Surety shall be obligated to full performance of the Contractor's undertaking.
- (f) Proof of Carriage of Insurance: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by the Owner."

29. Contract Security

The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract prices as security for the faithful performance of this Contract and also a payment bond in an amount not less than one hundred percent (100%) of the contract price or in a penal sum not less than that prescribed by State, territorial or local law, as security for the payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with local law.

30. Additional or Substitute Bond

If at any time the Owner for justifiable cause shall be or become dissatisfied with any Surety or Sureties, then upon the performance or payment bonds, the Contractor shall within five (5) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new Surety or Sureties shall have furnished such an acceptable bond to the Owner.

31. Assignments

The Contractor shall not assign the whole or any part of this Contract or any moneys due or to become due hereunder without written consent of the Owner. In case the

Contractor assigns all or any part of any moneys due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the corporations of services rendered or materials supplied for the performance of the work called for in this contract.

32. Mutual Responsibility of Contracts

If, through acts of neglect on the part of the Contractor, any other Contractor or any Subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other Contractor or Subcontractor by agreement or arbitration if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

33. Separate Contracts

The Contractor shall coordinate his operations with those of other Contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his Subcontractors, shall keep informed of the progress and the detail work of other Contractors and shall notify the Architect/Engineer immediately of lack of progress or defective workmanship on the part of other Contractors. Failure of a Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

34. Subcontracting

- (a) The Contractor may utilize the services of specialty Subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty Subcontractors.
- (b) The Contractor shall not award any work to any Subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the Subcontractor, which statement shall contain such information as the Owner may require.
- (c) The Contractor shall be as fully responsible to the Owner for the acts and omissions of his Subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.
- (d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind Subcontractors to the Contractor by the terms of the General Conditions and other Contract Documents insofar as applicable to the work of Subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.

- (e) Nothing contained in this Contract shall create any contractual relation between any Subcontractor and the Owner.

35. Architect/Engineer's Authority

The Architect/Engineer shall give all orders and directions contemplated under this contract and specifications, relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability and fitness of the several kinds of work and materials which are to be paid for under this Contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said Contract and specifications, the determination or decision of the Architect/Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this Contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor under this Contract and other Contractors performing work for the Owner shall be adjusted and determined by the Architect/Engineer.

36. Stated Allowances

The Contractor shall include in his proposal the cash allowances stated in the Supplemental General Conditions. The Contractor shall purchase the "Allowed Materials" as directed by the Owner on the basis of the lowest and best bid of at least three competitive bids. If the actual price for purchasing the "Allowed Materials" is more or less than the "Cash Allowance," the contract price shall be adjusted accordingly. The adjustment in contract price shall be made on the basis of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "Allowed Materials" shall be included in the applicable sections of the Contract Specifications covering this work.

37. Use of Premises and Removal of Debris

The Contractor expressly undertakes at his own expense:

- (a) To take every precaution against injuries to persons or damage to property.
- (b) To store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other Contractors.
- (c) To place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work.
- (d) To clean up frequently all refuse, rubbish, scrap materials and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance.
- (e) Before final payment to remove all surplus material, false-work, temporary structures, including foundations thereof, plant of any description and debris

of every nature resulting from his operations, and to put the site in a neat, orderly condition.

- (f) To effect all cutting, fitting or patching of his work required to make the same to conform to the plans and specifications and, except with the consent of the Architect/Engineer, not to cut or otherwise alter the work of any other Contractor.

38. Quantities of Estimate

Wherever the estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this Contract, and such increase or diminution shall in no way vitiate this Contract, nor shall any such increase or diminution give cause for claims or liability for damages.

39. Lands and Rights-of-Way

Prior to the start of construction, the Owner shall obtain lands and rights-of-way necessary for the carrying out and completion of work to be performed under this Contract.

40. General Guaranty

Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the Owner, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness.

41. Conflicting Conditions

Any provisions in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

42. Notice and Service Thereof

Any notice to any Contractor from the Owner relative to any part of this Contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor at his last given address or delivered in person to the said Contractor or his authorized representative on the work.

43. Provisions Required by Law Deemed Inserted

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of

either party the Contract shall forthwith be physically amended to make such insertion or correction.

44. Protection of Lives and Health

"The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the work. The safety provisions of applicable laws and building and construction codes, in addition to specific safety and health regulations described by Chapter XIII, Bureau of Labor Standards, Department of Labor, Part 1518, Safety and Health Regulations for Construction, as outlined in the Federal Register, Volume 36, No.75, Saturday, April 11, 1971. Title 29 -LABOR, shall be observed and the Contractor shall take or cause to be taken, such additional safety and health measures as the Contracting Authority may determine to be reasonably necessary."

45. Subcontracts

"The Contractor will insert in any subcontracts the Federal Labor Standards Provision contained herein and such other clauses as the Department of Housing and Urban Development may, by instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made."

46. Interest of Member of or Delegate to Congress

No member of or delegate to Congress or Resident Commissioner shall be admitted to any share or part of this Contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Contract if made with a corporation for its general benefit.

47. Other Prohibited Interests

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract or in any part thereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this Contract or in any part thereof, any material supply contract, subcontract, insurance contract or any other contract pertaining to the project.

48. Use and Occupancy Prior to Acceptance by Owner

The Contractor agrees to use and occupancy of a portion or unit of the project before formal acceptance by the Owner, provided the Owner:

- (a) Secures written consent of the Contractor except in the event, in the opinion of the Architect/Engineer, the Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other Contract requirements.

- (b) Secures endorsement from the insurance carrier and consent of the surety permitting occupancy of the building or use of the project during the remaining period of construction.

Or

- (c) When the project consists of more than one building, and one of the buildings is occupied, secures permanent fire and extended coverage insurance, including a permit to complete construction. Consent of Surety must also be obtained.

49. Photographs of the Project

If required by the Owner, the Contractor shall furnish photographs of the project, in the quantities and as described in the Supplemental General Conditions.

50. Suspension of Work

Should the Owner be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the Owner, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable time as the Owner may determine will compensate for time lost by such delay with such determination to be set forth in writing.

51. Access to Records

The Contractor shall maintain accounts and project records, including personnel, property and financial records, adequate to identify and account for all costs pertaining to the Contract and such other records as may be deemed necessary by the City/County to assure proper accounting for all project funds, both CDBG and non-CDBG shares. These records will be made available to the City, the Kentucky Department of Local Government, Commonwealth of Kentucky Finance & Administration Cabinet, Commonwealth of Kentucky Auditor of Public Audits, Commonwealth of Kentucky Legislative Research Commission, U.S. Department of Housing and Urban Development, the U. S. Department of Labor, and the Comptroller General of the United States, or any of their duly authorized representatives. These parties shall have access to any books, documents, papers and records of the Contractor which are directly pertinent to the project, for the purpose of making audit, examination, excerpts, and transcriptions. All records shall be maintained for five years after project closeout.

52. Federal Labor Standards Provisions (HUD-401 0,2-84)

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A.1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any

account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1 (b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR Part 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321 shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can easily be seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

1. The work to be performed by the classification requested is not performed by a classification in the wage determination; and
2. The classification is utilized in the area by the construction industry; and
3. The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U. S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or

its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(b) or (c) of the paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal Contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are

due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and Basic Records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project). Such records shall contain the name, address and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1 (b)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1 (b)(2)(B) of Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR Part 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U. S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

1. That the payroll for the payroll period contains the information required to be maintained under 29 CFR Part 5.5(a)(3)(i) and that such information is correct and complete;
2. That each laborer or mechanic (including each helper 1 apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have

been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3.

3. That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph A.3(ii)(b) of this section.

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 and Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph A.3(i) of this section available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant 20 CFR Part 5.12.

4. (i) Apprentices and Trainees. Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U. S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall

be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U. S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity .The utilization of apprentices, trainees and journeymen under this part shall be in conformity with equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act Requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract.
6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clause contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as HUD or its designee may be appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

7. **Contract Termination; Debarment.** A breach of contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 CFR Part 5.12.
8. **Compliance with Davis-Bacon and Related Act Requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1,3, and 5 are herein incorporated by reference in this contract.
9. **Disputes Concerning Labor Standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U. S. Department of Labor, or the employees or their representatives.
10. (i) **Certification of Eligibility .**By entering into this contract, the contractor certified that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No pan of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis- Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C.1001. Additionally, U. S. Criminal Code, Section 1010, Title 18, U.S.C., "Federal Housing Administration transactions," provides in part: "Whoever, for the purpose of ...influencing in any way the action of such Administration ...makes, utters, or publishes any statement, knowing the same to be false ...shall be fined not more than \$5,000 or imprisoned not more than two years, or both."
11. **Complaints, Proceedings, or Testimony by Employees.**
 - (a) No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under Contract to his employer.
 - B. **Contract Work Hours and Safety Standards Act (over \$100,000).** As used in this paragraph, the terms "laborers' and "mechanics" include watchmen and guards.
 1. **Overtime Requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives

compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; Liability For Unpaid Wages; Liquidated Damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.
3. Withholding For Unpaid Wages and Liquidated Damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.
4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety

- (1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.
- (2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 (formerly Part 1518) and failure to comply may result in imposition of sanctions

pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96).

- (3) The Contractor shall include the provisions of this Article in every subcontract so that such provisions will be binding on each subcontractor. The Contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

53. Anti-Kickback Act

Attachment to Federal Labor Standards Provisions, So-Called "Anti-Kickback Act" and Regulations Promulgated Pursuant Thereto by the Secretary of Labor. United States Department of Labor. Title 18, U.S.C., Section 874 (HUD-4010, 2-76) (Replaces section 1 of the Act of June 13, 1934 (48 Stat. 948, 40 U.S.C., Section 276B) pursuant to the Act of June 25, 1948, 62 Stat. 862).

Kickbacks from Public Works Employees

Whoever, by force, intimidation, or threat of procuring dismissal from employment, or by any other manner whatsoever induces any person employed in the construction, prosecution, completion or repair of any public building, public work, or building or work financed in whole or in part by loans or grants from the United States, to give up any part of the compensation to which he is entitled under his contract of employment, shall be fined not more than \$5,000 or imprisoned not more than five years, or both.

Section 2 of the Act of June 13, 1934, as amended (48 Stat. 948, 62 Stat. 862, 63 Stat. 108, Stat. 967, 40 U.S.C., section 276c).

The Secretary of Labor shall make reasonable regulations for contractors and subcontractors engaged in the construction, prosecution, completion or repair of buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States, including a provision that each contractor shall furnish weekly a statement with respect to the wages paid each employee during the preceding week. Section 1001 of Title 18 (United States Code) shall apply to such statements.

Pursuant to the aforesaid Anti-Kickback Act, the Secretary of Labor, United States Department of Labor, has promulgated the regulations hereinafter set forth, which regulations are found in Title 29, Subtitle A, Code of Federal Regulations, Part 3. The term "this part", as used in the regulations hereinafter set forth, refers to Part 3 last above mentioned. Said regulations are as follows.

Title 29 – Labor; Subtitle A – Office of the Secretary of Labor, Part 3 – Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in part by loans or grants from the United States.

Section 3.1 – Purpose and scope

This part prescribes "anti-kickback" regulations under section 2 of the Act of June 13, 1934, as amended (40 U.S.C. 276c), popularly known as the Copeland Act. This part applies to any contract which is subject to Federal wage standards and which is for the construction, prosecution, completion, or repair of public buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States. The part is intended to aid in the enforcement of the minimum wage provisions of the Davis-Bacon Act and the various statutes dealing with Federally- assisted construction that contain similar minimum wage provisions, including those provisions which are not subject to Reorganization Plan No.14 (e.g., the College Housing Act of 1950, the Federal Water Pollution Control Act, and the Housing Act of 1959), and in the enforcement of the overtime provisions of the Contract Work Hours Standards Act whenever they are applicable to construction work. The part details the obligation of contractors and subcontractors relative to the weekly submission of statements regarding the wages paid on work covered thereby; sets forth the circumstances and procedures governing the making of payroll deductions from the wages of those employed on such work; and delineates the methods of payment permissible on such work.

Section 3.2 – Definitions.

As used in the regulations in this part:

- (a) The terms "building" or "work" generally include construction activity as distinguished from manufacturing, furnishing of materials, or servicing and maintenance work. The terms include, without limitation, buildings, structures, and improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, pumping stations, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals; dredging, shoring, scaffolding, drilling, blasting, excavating, clearing, and landscaping. Unless conducted in connection with and at the site of such a building or work as is described in the foregoing sentence, the manufacture or furnishing of materials, articles, supplies, or equipment (whether or not a Federal or State agency acquires title to such materials, articles, supplies, or equipment during the course of the manufacture or furnishing, or owns the materials from which they are manufactured or furnished) is not a "building" or "work" within the meaning of the regulations in this part.
- (b) The terms "construction", "completion," or "repair" mean all types of work done on a particular building or work at the site thereof, including, without limitation, altering, remodeling, painting and decorating, the transporting of materials and supplies to or from the building or work by the employees of the construction contractor or construction subcontractor, and the manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the building or work, by persons employed at the site by the contractor or subcontractor.
- (c) The terms "public building" or "public work" include building or work for whose construction, prosecution, completion, or repair, as defined above, a Federal agency is a contracting party, regardless of whether title thereof is in a Federal agency.
- (d) The term "building or work financed in whole or in part by loans or grants from the United States" includes building or work for whose construction, prosecution,

completion, or repair, as defined above, payment or part payment is made directly or indirectly from funds provided by loans or grants by a Federal agency. The term does not include building or work for which Federal assistance is limited solely to loan guarantees or insurance.

- (e) Every person paid by a contractor or subcontractor in any manner for his labor in the construction, prosecution, completion, or repair of a public building or public work or work financed in whole or in part by loans or grants from the United States is "employed" and receiving "wages," regardless of contractual relationship alleged to exist between him and the real employer.
- (f) The term "any affiliated person" includes a spouse, child, parent, or other close relative of the contractor or subcontractor; a partner or officer of the contractor or subcontractor; a corporation closely connected with the contractor or subcontractor as parent, subsidiary or otherwise, and an officer or agent of such corporation.
- (g) The term "Federal agency" means the United States, the District of Columbia, and all executive departments, independent establishments, administrative agencies, and instrumentalities of the United States and of the District of Columbia, including corporations, all or substantially all of the stock of which is beneficially owned by the United States, by the District of Columbia, or any of the foregoing departments, establishments, agencies, and instrumentalities.

Section 3.3 – Weekly statement with respect to payment of wages

- (a) As used in this section, the term "employee" shall not apply to persons in classifications higher than that of laborer or mechanic and those who are the immediate supervisors of such employees.
- (b) Each contractor or subcontractor engaged in the construction, prosecution, completion, or repair of any public building or public work, or building or work financed in whole or in part by loans or grants from the United States, shall furnish each week a statement with respect to the wages paid each of its employees engaged on work covered by 29 CFR Parts 3 and 5 during the preceding weekly payroll period. This statement shall be executed by the contractor or subcontractor or by an authorized officer or employee of the contractor or subcontractor who supervises the payment of wages and shall be on form WH 348, "Statement of Compliance," or on an identical form on the back of WH 347, "Payroll (For Contractors Optional Use)" or on any form with identical wording. Sample copies of WH 347 and WH 348 may be obtained from the Government contracting or sponsoring agency, and copies of these forms may be purchased at the Government Printing Office.
- (c) The requirements of this section shall not apply to any contract of \$2,000 or less.
- (d) Upon a written finding by the head of a Federal agency, the Secretary of Labor may provide reasonable limitations, variations, tolerances and exemptions from the requirements of this section subject to such conditions as the Secretary of Labor may specify.

(29 F.R. 95, Jan. 4 1964, as amended at 33 FR 10186, July 17, 1968)

Section 3.4 – Submission of weekly statements and the preservation and inspection of weekly payroll records.

- (a) Each weekly statement required under SS 3.3 shall be delivered by the contractor or subcontractor within seven days after the regular payment date of the payroll period, to a representative of a Federal or State agency in charge at the site of the building or work, or, if there is no representative of a Federal or State agency at the site of the building or work, the statement shall be mailed by the contractor or subcontractor, within such time, to a Federal or State agency contracting for or financing the building or work. After such examination and check as may be made, such statement, or a copy thereof, shall be kept available, or shall be transmitted together with a report of any violation, in accordance with applicable procedures prescribed by the United States Department of Labor.
- (b) Each contractor or subcontractor shall preserve his weekly payroll records for a period of three years from date of completion of the contract. The payroll records shall set out accurately and completely the name and address of each laborer and mechanic, his correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid. Such payroll records shall be made available at all times for inspection by the contracting officer or his authorized representative, and by authorized representatives of the Department of Labor.

Section 3.5 – Payroll deductions permissible without application to or approval of the Secretary of Labor.

Deductions made under the circumstances or in the situations described in the paragraphs of this section may be made without application to and approval of the Secretary of Labor.

- (a) Any deduction made in compliance with the requirements of Federal, State or local law, such as Federal or State withholding income taxes and Federal social security taxes.
- (b) Any deduction of sums previously paid to the employee as a bona fide prepayment of wages when such prepayment is made without discount or interest. A "bona fide prepayment of wages" is considered to have been made only when cash or its equivalent has been advanced to the person employed in such manner as to give him complete freedom of disposition of the advanced funds.
- (c) Any deduction of amounts required by court process to be paid to another, unless the deduction is in favor of the contractor, subcontractor or any affiliated person, or when collusion or collaboration exists.
- (d) Any deduction constituting a contribution on behalf of the person employed to funds established by the employer or representatives of employees, or both, for the purpose of providing *either* from principal or income, or both, medical or hospital care, pensions or annuities on retirement, death benefits, compensation for injuries, illness, accidents, sickness, or disability, or for insurance to provide

any of the foregoing, or unemployment benefits, vacation pay, savings accounts, or similar payments for the benefit of employees, their families and dependents: Provided, however, That the following standards are met: (1) The deduction is not otherwise prohibited by law; (2) it is either: (i) Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of or for the continuation of employment, or (ii) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees; (3) no profit or other benefit is otherwise obtained, directly or indirectly, by the contractor or subcontractor or any affiliated person in the form of commission, dividend, or otherwise; and (4) the deductions shall serve the convenience and interest of the employee.

- (e) Any deduction contribution toward the purchase of United States Defense Stamps and Bonds when voluntarily authorized by the employee.
- (f) Any deduction requested by the employee to enable him to repay loans to or to purchase shares in credit unions organized and operated in accordance with Federal and State credit union statutes.
- (g) Any deduction voluntarily authorized by the employee for the making of contributions to governmental or quasi-governmental agencies, such as the American Red Cross.
- (h) Any deduction voluntarily authorized by the employee for the making of contributions to Community Chests, United Givers Funds, and similar charitable organizations.
- (i) Any deductions to pay regular union initiation fees and membership dues, not including fines or special assessments: Provided, however I That a collective bargaining agreement between the contractor or subcontractor and representatives of its employees provides for such deductions and the deductions are not otherwise prohibited by law.
- (j) Any deduction not more than for the "reasonable cost" of board, lodging, or other facilities meeting the requirements of section 3(m) of the Fair Labor Standards Act of 1938, as amended, and Part 431 of this title. When such a deduction is made the additional records required under SS 516.27(a) of this title shall be kept.

Section 3.6 – Payroll deductions permissible with the approval of the Secretary of Labor.

Any contractor or subcontractor may apply to the Secretary of Labor for permission to make any deduction not permitted under SS 3.5. The Secretary may grant permissions whenever he finds that:

- (a) The contractor, subcontractor, or any affiliated person does not make a profit or benefit directly or indirectly from the deduction either in the form of a commission, dividend, or otherwise;

- (b) The deduction is not otherwise prohibited by law;
- (c) The deduction is either (1) voluntarily consented to by the employee in writing and in advance of the period in which the work to be done, and such consent is not a condition either for the obtaining of employment or its continuance, or (2) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees; and
- (d) The deduction serves the convenience and interest of the employee.

Section 3.7 – Applications for the approval of the Secretary of Labor.

Any application for the making of payroll deductions under SS 3.6 shall comply with the requirements prescribed in the following paragraphs of this section:

- (a) The application shall be in writing and shall be addressed to the Secretary of Labor.
- (b) The application shall identify the contract or contracts under which the work in question is to be performed. Permission will be given for deductions only on specific, identified contracts, except upon a showing of exceptional circumstances.
- (c) The application shall state affirmatively that there is compliance with the standards set forth in the provisions of SS 3.6. The affirmation shall be accompanied by a full statement of the facts indicating such compliance.
- (d) The application shall include a description of the proposed deduction, the purpose to be served thereby, and the classes of laborers or mechanics from whose wages the proposed deduction would be made.
- (e) The application shall state the name and business of any third person to whom any funds obtained from the proposed deductions are to be transmitted and the affiliation of such person, if any, with the applicant.

Section 3.8 – Action by the Secretary of Labor upon applications.

The Secretary of Labor shall decide whether or not the requested deduction is permissible under provisions of SS 3.6; and shall notify the applicant in writing of his decision.

Section 3.9 – Prohibited payroll deductions.

Deductions not elsewhere provided for by this part and which are not found to be permissible under SS 3.6 are prohibited.

Section 3.10 – Methods of payment of wages.

The payment of wages shall be by cash, negotiable instruments payable on demand, or the additional forms of compensation for which deductions are permissible under this part. No other methods of payment shall be recognized on work subject to the Copeland Act.

Section 3.11 – Regulations part of contract.

All contracts made with respect to the construction, prosecution, completion, or repair of any public building or public work or building or work financed in whole or in part by loans or grants from the United States covered by the regulations in this part shall expressly bind the contractor or subcontractor to comply with such of the regulations in this part as may be applicable. In this regard, see SS 5.5(a) of this subtitle.

18.

**SUPPLEMENTAL GENERAL CONDITIONS
Including Equal Opportunity Provisions**

1. Enumeration of Plans, Specifications and Addenda
2. Stated Allowances
3. Special Hazards
4. Contractor's and Subcontractor's Public Liability, Vehicle Liability and Property Damage Insurance
5. Photographs of Project
6. Schedule of Occupational Classifications and Minimum Hourly Wage Rates
7. Builder's Risk Insurance
8. Special Equal Opportunity Provisions
9. Certification of Compliance with Air and Water Acts
10. Special Conditions Pertaining to Hazards, Safety Standards and Accident Prevention
11. Energy Efficiency
12. Access to Records
13. Wage Rate Determination(s)
14. Contract Work Hours and Safety Standards Act
15. Enumeration of Plans, Specifications and Addenda

Following are the Plans, Specifications and Addenda which form a part of this Contract, as set forth in paragraph 1 of the General Conditions, "Contract and Contract Documents":

DRAWINGS

General Construction: Nos. **C-1 thru C-12, D-1 thru D-2**

Heating and Ventilating: Nos. **N/A**

Plumbing: Nos. **N/A**

Electrical: Nos. **N/A**

SPECIFICATIONS:

General Construction: Page 1-1 to 115101-16, inclusive
Heating and Ventilating: N/A Page _____ to _____, inclusive
Plumbing: N/A Page _____ to _____, inclusive
Electrical: N/A Page _____ to _____, inclusive
Page _____ to _____, inclusive
Page _____ to _____, inclusive

ADDENDA:

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

1. Stated Allowances

Pursuant to Paragraph 36 of the General Conditions, the Contractor shall include the following cash allowances in his proposal N/A

- (a) For _____ (Page _____ of Specifications) \$ _____
- (b) For _____ (Page _____ of Specifications) \$ _____
- (c) For _____ (Page _____ of Specifications) \$ _____
- (d) For _____ (Page _____ of Specifications) \$ _____
- (e) For _____ (Page _____ of Specifications) \$ _____
- (f) For _____ (Page _____ of Specifications) \$ _____

3. Special Hazards

The Contractor's and his Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards:

4. Contractor's and Subcontractor's Public Liability, Vehicle Liability and Property Damage Insurance

As required under paragraph 28 of the General Conditions, the Contractor's Public Liability Insurance and Vehicle Insurance shall be in an amount not less than \$____
_____ for injuries, including accidental death, to any one person, and subject to the

same limit for each person, in an amount not less than \$_____ on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$_. ***SEE SECTION 21 - SPECIAL CONDITIONS**

The Contractor shall either (1) require each of his Subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage Insurance of the type and in the same amounts as specified in the preceding paragraph, or (2) insure the activities of his Subcontractors in his own policy.

5. Photographs of Project

As provided in paragraph 30 of General Conditions, the Contractor will furnish photographs in the number, type and stage as enumerated below:

6. Schedule of Occupational Classifications and Minimum Hourly Wage Rate as required under paragraph 52 of the General Conditions.

7. Builder's Risk Insurance

As provided in the General Conditions, paragraph 28(e), the Contractor will/will not* maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portions of the project for the benefit of the Owner, the Contractor and all Subcontractors, as their interests may appear.

* Strike out one.

8. Special Equal Opportunity Provisions

A. 3-Paragraph Equal Opportunity Clause for Activities and Contracts Not subject to Executive Order 11246, as Amended (applicable to Federally assisted construction contracts and related subcontracts \$10,000 and under)

During the performance of this Contract, the Contractor agrees as follows:

1. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor shall take affirmative action to ensure that applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.
2. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by contracting officer setting forth the provisions of this nondiscrimination clause. The Contractor shall state that all qualified applicants will receive consideration for employment without regard to race, color, religion, or sex or national origin.

3. Contractors shall incorporate forgoing requirements in all subcontracts.

B. Executive Order 11246 (contracts/subcontracts above \$10,000)

1. Section 202 Equal Opportunity Clause

During the performance of this Contract, the Contractor agrees the following:

- a. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- b. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration without regard to race, color, religion, sex or national origin.
- c. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided by the Contract Compliance Officer advising the said labor union or workers' representatives of the Contractor's commitment under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- d. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.
- e. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records and accounts by the Department and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and others.

- f. In the event of the Contractor's non-compliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations or orders, this Contract may be canceled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of-September 24, 1965, or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.
 - g. The Contractor will include the provisions of the sentence immediately preceding paragraph a. and the provisions of paragraphs a. through g. in every subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Department may direct as a means of enforcing such provisions, including sanctions for non-compliance. Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the Department, the Contractor may request the United States to enter into such litigation to protect the interest of the United States.
2. Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246) (applicable to contract/subcontracts exceeding \$10,000)
- a. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications", set forth herein.
 - b. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for Minority
Participation

7.0%

Goals for Female
Participation

6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or Federally assisted) performed in the covered area. If the Contractor performs construction work in a geographic area located outside of the covered area, it shall apply the goals established for such geographic area where the work is

actually performed. With regard to this second area, the Contractor also is subject to the goals for both its Federally involved and non-Federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60- 4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation 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 the 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 the Contractor's goal shall be a violation of the Contract, the Executive Order and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

- c. The 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 the subcontract; and the geographical area in which the contract is to be performed.
 - d. As used in this notice, and in the contract resulting from the solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county, and city, if any).
3. Standard CDBG Assisted Employment Opportunity Construction Contract Specifications (Executive Order 11246)
- a. As used in these specifications:
 - (1) "Covered area" means the geographical area described in solicitation from which this Contract resulted.
 - (2) "Director" means Director, Office of Federal Contract Compliance Program, United States Department of Labor, or any person to whom the Director delegates authority.

- (3) "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
- (4) "Minority" includes:
- (a) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin).
 - (b) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race).
 - (c) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent or the Pacific Islands).
 - (d) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
- (5) Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this Contract resulted.
- (6) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plant approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the plan area (including goals and timetables) shall be in accordance with that plan for those trades which have unions participating in the plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the plan goals and timetables.
- (7) The Contractor shall implement the specific affirmative action standards provided in paragraphs 10a through p of these specifications. The goals set forth in the solicitation form which this Contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in

each construction trade in which it has employees in the covered area. Covered construction Contractors- performing contracts in geographical areas where they do not have a Federal or Federally-assisted construction contract shall apply the minority and female goals established for the geographic area where the contract is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting, its goals in each craft during the period specified.

- (8) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
- (9) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.
- (10) The Contractor shall take specific affirmative actions to ensure equal employment opportunity .The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
 - (a) Ensure and maintain a working environment free of harassment, intimidation and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

- (b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organization's responses.
- (c) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.
- (d) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- (e) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 10b above.
- (f) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel at least once a year; and by posting the company EEO policy on bulletin boards accessible to all

employees at each location where construction work is performed.

- (g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed and disposition of the subject matter.
- (h) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- (i) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations such as the above, describing the openings, screening procedures and tests to be used in the selection process.
- (j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.
- (k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

- (l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
 - (m) Ensure that seniority practices job classifications work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy under the Contractor's obligations under these specifications are being carried out.
 - (n) Ensure that all facilities and company activities are non-segregated except that separate or single-use toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - (o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - (p) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
- (11) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (10a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 10a through p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation shall not be a defense for the Contractor's non-compliance.

- (12) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
- (13) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex or national origin.
- (14) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
- (15) The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Employment Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
- (16) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 10 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
- (17) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed.

Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.

- (18) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

C. Certification of Nonsegregated Facilities (over \$10,000)

By the submission of this bid, the bidder, offeror, applicant or subcontractor certifies that s/he does not maintain or provide for his/her employees any segregated facility at any of his/her establishments, and that s/he does not permit employees to perform their services at any location, under his/her control, where segregated facilities are maintained. S/he certifies further that s/he will not maintain or provide for employees any segregated facilities at any of his/her establishments, and s/he will not permit employees to perform their services at any location under his/her control where segregated facilities are maintained. The bidder, offeror, applicant or subcontractor agrees that a breach of this certification is a violation of the Equal Employment Opportunity Clause of this 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, *transportation and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom or otherwise. S/he further agrees that (except where he/she has obtained identical certifications from proposed Subcontractors for specific time periods) he/she will obtain identical certification 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 he/she will retain such certifications in his/her files; and that he/she will forward the following notice to such proposed Subcontractors (except where proposed Subcontractors have submitted identical certifications for specific time periods).

* Parking lots, drinking fountains, recreation or entertainment areas.

D. Title VI Clause, Civil Rights Act of 1964

Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

E. Section 109 Clause, Housing and Community Development Act of 1974

No person in the United States shall on the grounds of race, color national origin or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.

F. "Section 3" Compliance in the Provision of Training, Employment and Business Opportunities (Over \$100,000)

1. The work to be performed under this Contract is on a project assisted under a program providing direct Federal financial assistance from the Department of Housing and Urban Development and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701 u. Section 3 requires that to the greatest extent feasible, opportunities for training and employment be given lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in the area of the project.
2. The parties to this Contract will comply with the provisions of said Section 3 and the regulations issued pursuant thereto by the Secretary of Housing and Urban Development set forth in 24 CFR 135, and all applicable rules and orders of the Department issued thereunder prior to the execution of this Contract. The parties to this Contract certify and agree that they are under no contractual or other disability which would prevent them from complying with these requirements.
3. The Contractor will send to each labor organization or representative of workers with which he has a collective bargaining agreement or other contract of understanding, if any, a notice advising the said labor organization or workers' representative of his commitments under this Section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment or training.
4. The Contractor will include this Section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the Subcontractor is in violation of regulations issued by the Secretary of Housing and Urban Development, 24 CFR Part 135. The Contractor will not subcontract with any Subcontractor where it has notice or knowledge that the latter has been found in violation of regulations under 24 CFR Part 135 and will not let any subcontract unless the Subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.
5. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR Part 135, and all applicable rules and orders of the Department issued hereunder prior to the execution of the Contract, shall be a condition of the Federal financial assistance provided to the project,

binding upon the applicant or recipient for such assistance, its successors and assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successors and assigns to those sanctions specified by the grant or loan agreement or contract through which Federal assistance is provided, and to such sanctions as are specified in 24 CFR Part 135.

G. Rehabilitation Act of 1973, Section 503 Handicapped (if \$10,000 or over)

Affirmative Action for Handicapped Workers

1. The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training including apprenticeship.
2. The Contractor agrees to comply with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.
3. In the event of the Contractor's non-compliance with the requirements of this clause, actions for non-compliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
4. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment notices in a form to be prescribed by the Director, provided by or through the contracting officer. Such notices shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.
5. The Contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physical and mentally handicapped individuals.
6. The Contractor will include the provisions of this clause in every subcontract or purchase order of \$10,000 or more unless exempted by rules, regulations or orders of the Secretary issued pursuant to Section 503 of the Act, so that such provisions will be binding upon each Subcontractor or vendor. The Contractor will take such action with

respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for non-compliance.

H. Section 402 Veterans of the Vietnam Era (if \$10,000 or over)

Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era

1. The Contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified disabled veterans and veterans of the Vietnam era without discrimination based on their disability or veteran status in all employment practices such as the following: employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training including apprenticeship.
2. The Contractor agrees that all suitable employment openings of the Contractor which exist at the time of the execution of this Contract and those which occur during the performance of this Contract, including those not generated by this Contract and including those occurring at an establishment of the Contractor other than the one wherein the Contract is being performed but excluding those of independently operated corporate affiliates, shall be listed at an appropriate local office of the State employment service system wherein the opening occurs. The Contractor further agrees to provide such reports to such local office regarding employment openings and hires as may be required. State and local government agencies holding Federal contracts of \$10,000 or more shall also list all their suitable openings with the appropriate office of the State employment service, but are not required to provide those reports set forth in paragraphs 4 and 5.
3. Listing of employment openings with the employment service system pursuant to this clause shall be made at least concurrently with the use of any other recruitment source or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and non- veterans. The listing of employment openings does not require the hiring of any particular *job* applicant or from any particular group of job applicants, and nothing herein is intended to relieve the Contractor from any requirements in Executive Orders or regulations regarding nondiscrimination in employment.
4. The reports required by paragraph 2 of this clause shall include, but not be limited to, periodic reports which shall be filed at least quarterly with the appropriate local office or, where the Contractor has more than one hiring location in a State, with the central office of that State employment service. Such reports shall indicate for each hiring location (1) the number

of individuals hired during the reporting period, (2) the number of nondisabled veterans of the Vietnam era hired, (3) the number of disabled veterans of the Vietnam era hired, and (4) the total number of disabled veterans hired. The reports should include covered veterans hired for on-the-job training under 38 U.S.C. 1787. The Contractor shall submit a report within 30 days after the end of each reporting period wherein any performance is made on this Contract identifying data for each hiring location copies of the reports submitted until the expiration of one year after final payment under the Contract, during which time these reports and related documentation shall be made available, upon request, for examination by any authorized representatives of the contracting officer or of the Secretary of Labor. Documentation would include personnel records respecting job openings, recruitment and placement.

5. Whenever the Contractor becomes contractually bound to the listing provisions of this clause, it shall advise the employment service system in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these provisions and has so advised the State system, there is no need to advise the State system of subsequent contracts. The Contractor may advise the State system when it is no longer bound by the contract clause.
6. This clause does not apply to the listing of employment openings which occur and are filled outside of the 50 states, the District of Columbia, Puerto Rico, Guam and the Virgin Islands.
7. The provisions of paragraphs 2. 3. 4 and 5 of this clause do not apply to openings which the Contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement. This exclusion does not apply to a particular opening once an employer decides to consider applicants outside of his own organization or employer-union arrangement for that opening.
8. As used in this clause:
 - a. "All suitable employment openings" includes, but is not limited to, openings which occur in the following job categories: production and nonproduction; plant and office; laborers and mechanics; supervisory and nonsupervisory; technical; and executive, administrative, and professional openings are compensated on a salary basis of less than \$25,000 per year. This term includes full-time employment, temporary employment of more than three days' duration, and part-time employment. It does not include openings which the Contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement nor openings in an educational institution which are restricted to students of that institution. Under the most compelling circumstances an employment opening may not be suitable for listing, including such situations where the needs

of the Government cannot reasonably be otherwise supplied, where listing would be contrary to national security, or where the requirement of listing would otherwise not be for the best interest of the Government.

- b. "Appropriate office of the State employment service system" means the local office of the Federal-State national system of public employment offices with assigned responsibility for serving the area where the employment opening to be filled, including the District of Columbia, Guam, Puerto Rico and the Virgin Islands.
 - c. "Openings which the Contractor proposes to fill from within his own organization" means employment openings for which no consideration will be given to persons outside the Contractor's organization (including any affiliates, subsidiaries, and the parent companies) and includes any openings which the Contractor proposes to fill from regularly established "recall" lists.
 - d. "Openings which the Contractor proposes to fill pursuant to a customary and traditional employer-union hiring arrangement" means employment openings which the Contractor proposes to fill from union halls, which is part of the customary and traditional-hiring relationship which exists between the Contractor and representatives of his employees.
- 9. The contractor agrees to comply with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.
 - 10. In the event of the Contractor's non-compliance with the requirements of this clause, actions for non-compliance may be taken in accordance with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.
 - 11. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the contracting officer. Such notice shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified disabled veterans and veterans of the Vietnam era for employment, and the rights of applicants and employees.
 - 12. The Contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of the Vietnam Era Veterans Readjustment Assistance Act, and is committed to take affirmative action to employ and advance in employment qualified disabled veterans and veterans of the Vietnam Era.
 - 13. The Contractor will include the provisions of this clause in every subcontract or purchase order of \$10,000 or more unless exempted by

rules, regulations or orders of the Secretary issued pursuant to the Act, so that such provisions will be binding upon each Subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for non-compliance.

I. Age Discrimination Act of 1975

During the performance of this Contract, the Contractor agrees as follows: the Contractor agrees not to exclude from participation, deny program benefits, or discriminate on the basis of age.

9. Certification of Compliance with Air and Water Acts (applicable to Federally assisted construction contracts and related subcontracts exceeding (\$100,000)

Compliance with Air and Water Acts

During the performance of this Contract, the Contractor and all Subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 USC 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR Part 15, as amended.

In addition to the foregoing requirements, all "nonexempt" Contractors and Subcontractors shall furnish to the Owner, the following:

- A. A stipulation by the Contractor or Subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.
- B. Agreement by the Contractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USC 1857c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 USC 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.
- C. A stipulation that as a condition for the award of the Contract, prompt notice will be given of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized, or to be utilized for the Contract, is under consideration to be listed on the EPA List of Violating Facilities.
- D. Agreement by the Contractor that he will include, or cause to be included, the criteria and requirements in paragraphs A through D of this section in every nonexempt subcontract and requiring that the Contractor will take such actions as the Government may direct as a means of enforcing such provisions.

10. Special Conditions Pertaining to Hazards, Safety Standards and Accident Prevention

A. Lead-Based Paint Hazards (applicable to contracts for construction or rehabilitation of residential structures)

The construction or rehabilitation of residential structures is subject to the HUD Lead-Based Paint regulations, 24 CFR Part 35. The Contractor and Subcontractors shall comply with the provisions for the elimination of lead-based paint hazards under sub-part B of said regulations. The Owner will be responsible for the inspections and certifications required under Section 35.14(f) thereof.

B. Use of Explosives (modify as required)

When the use of explosives is necessary for the prosecution of the work, the Contractor shall observe all local, State and Federal laws in purchasing and handling of explosives. The Contractor shall take all necessary precaution to protect completed work, neighboring property, water lines or other underground structures. Where there is danger to structures or property from blasting, the charges shall be reduced and the material shall be covered with suitable timer, steel or rope mats. The Contractor shall notify all owners of public utility property of intention to use explosives at least eight hours before blasting is done close to such property. Any supervision or direction of use of explosives by the Engineer, does not in any way reduce the responsibility of the Contractor or his Surety for damages that may be caused by such use.

C. Danger Signals and Safety Devices (modify as required)

The Contractor shall make all necessary precautions to guard against damages to property and injury to persons. He shall put up and maintain in good condition, sufficient red or warning lights at night, suitable barricades and other devices necessary to protect the public. In case the Contractor fails or neglects to take such precautions, the Owner may have such lights and barricades installed and charge the cost of this work to the Contractor. Such action by the Owner does not relieve the Contractor of any liability incurred under these specifications or Contract.

11. Energy Efficiency

The Contractor shall recognize mandatory standards and policies relating to energy efficiency, which are contained in the State Energy Conservation Plan issued in Compliance with the Energy Policy and Conservation Act.

12. Access to Records

The Contractor shall maintain accounts and project records, including personnel, property and financial records, adequate to identify and account for all costs pertaining to the Contract and such other records as may be deemed necessary by the City to assure proper accounting for all project funds, both CDBG and non-CDBG shares.

These records will be made available to the City, the Kentucky Department of Local Government, Commonwealth of Kentucky Finance & Administration Cabinet, Commonwealth of Kentucky Auditor of Public Audits, Commonwealth of Kentucky Legislative Research Commission, U.S. Department of Housing and Urban Development, the U. S. Department of Labor, and the Comptroller General of the United States, or any of their duly authorized representatives. These parties shall have access to any books, documents, papers and records of the Contractor, which are directly pertinent to the project, for the purpose of making audit, examination, excerpts and transcriptions. All records shall be maintained for five years after project closeout.

13. Wage Rate Determination(s)

SEE SECTION 22 & SECTION 23 FOR WAGE RATE DETERMINATIONS.

14. Contract Work Hours and Safety Standards Act

All grantees and subgrantee's contracts must contain provisions requiring compliance with sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 USC 327-330) as supplemented by Department of Labor regulations (29 CFR Part 5) where construction contracts are awarded by grantees or subgrantees in excess of \$2,000, and in excess of \$2,500 for other contracts involving the employment of mechanics and laborers.

ADDENDUM

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

If both State and Federal wage decisions apply, the highest of the wage rates shall apply to each individual classification.

Wage rates apply to all onsite workers and mechanics, including subcontractors. If both State and Federal wage decisions apply to the project, the more stringent of the federal or state requirements is applicable. Contractors 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 4-10-hour days in writing, regardless of how many hours worked per week. Each contractor & 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 CEDA to ensure it meets DOL requirements.

The successful 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 successful bidders' 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.

19.

SUPPLEMENTAL GENERAL CONDITIONS (ENGINEER)

1. ADDITIONAL INSTRUCTIONS

1.1 Second Hand or Salvaged Materials

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

All materials and/or equipment to be removed from existing structures and not specifically specified to be reused or stored shall be stored or removed for disposal as directed by the OWNER in the field. Reused or stored material and/or equipment remain the property of the OWNER. Material and/or equipment not reused or stored shall become the property of the CONTRACTOR. Such materials and/or equipment shall be promptly removed by the CONTRACTOR from the site for disposal by the CONTRACTOR.

1.2 Ownership of Plans and Models

All DRAWINGS, SPECIFICATIONS and copies thereof furnished to the CONTRACTOR by the OWNER are the property of the OWNER. They are not to be used on other WORK. All models are the property of the OWNER.

2. SURVEYS

2.1 Layout of WORK

2.1.1 General

The layout of the WORK shall be the responsibility of the CONTRACTOR and shall be subject to checking by the ENGINEER. The ENGINEER shall establish base lines and a system of bench levels for the CONTRACTOR'S use as required. All instruments, stakes, batter boards, barricades, traffic signs, flags, and other materials necessary, and personnel needed for establishing and marking lines, grades, and structure location during construction, shall be the responsibility of the CONTRACTOR.

The CONTRACTOR'S personnel engaged in the layout WORK described herein shall be fully capable of performing the duties set out herein and shall be fully qualified chiefs of party, instrumentmen, chainmen, rodmen and/or axmen as required.

3. PROTECTION OF PROPERTY

3.1 Use of Premises

The CONTRACTOR shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by Laws and Regulations, permits or directions of the OWNER and shall not unreasonably encumber the premises with his materials.

The CONTRACTOR shall not load or permit any part of the WORK to be loaded with a weight that will endanger its safety and integrity.

The CONTRACTOR shall enforce the Laws and Regulations regarding signs, advertisements, fires and smoking.

3.2 Damage to Equipment Stored

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

3.2.1 Be replaced with new equipment

3.2.2 With consent of the OWNER, be returned to the manufacturer of the equipment, or his authorized repair agency, for inspection and repair provided, however, that such repair after inspection will place the equipment in new condition, and restore the manufacturer's guarantee the same as for new equipment.

3.3 Conflict With or Damage To Underground Facilities

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 the OWNER or the ENGINEER by the owners of such underground facilities or by others. The OWNER and the ENGINEER shall not be responsible for the accuracy or completeness of any such information or data.

The CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all underground facilities shown or indicated in the CONTRACT DOCUMENTS, for coordination of the WORK with the owners of such underground facilities during construction, for the safety and protection thereof as provided in the CONTRACT DOCUMENTS, and for repairing any damage thereto resulting from the WORK, the cost of all of which is considered to be included in the CONTRACT PRICE.

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If an underground facility is uncovered or revealed at or contiguous to the site, which was not shown or indicated in the CONTRACT DOCUMENTS and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall, promptly after becoming aware thereof and before performing any WORK affected thereby (except in an emergency as permitted by paragraph 11.4 of the General Conditions), identify the owner of such underground facility and give WRITTEN NOTICE thereof to that owner and to the OWNER and the ENGINEER. The ENGINEER will promptly review the newly discovered site conditions and make a recommendation to the OWNER regarding amendment of the CONTRACT DOCUMENTS. During such time as the underground facility is exposed, the CONTRACTOR shall be responsible for the safety and protection of such underground facility as provided in paragraph 11.2 of the General Conditions.

Repair to existing utilities and facilities damaged by the CONTRACTOR'S construction forces shall be considered as a part of the Contract covered only by the prices bid for the new construction. The only exceptions to this provision, wherein extra compensation will be authorized, are:

Relocation of an existing facility due to direct conflict with performing the WORK.

Relocation (outside of limits of maximum allowable trench widths) of an existing facility presently located within the bounds of maximum allowable trench width, where necessitated for assurance against future damage due to settlement or to permit reasonable access to the new WORK.

Repair to damaged underground utilities, must meet the requirements of the agency in charge of that particular utility.

The intent of this article is to assure compensation to the CONTRACTOR for changes in existing utilities reasonably necessary, and at the same time, to protect the OWNER against excessive damages due to carelessness of the CONTRACTOR'S construction forces. Compensation for extra work covered herein shall be in accordance with other provisions of the General Conditions.

3.4 Damage to Stream

The CONTRACTOR shall be liable for any costs incurred by the OWNER as a result of damage to any stream resulting from improper protection during the construction of this PROJECT.

4. CONTRACT COSTS AND PAYMENTS

4.1 Cleaning Up

During the progress of the WORK, the CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish, weeds, brush or other debris caused by the CONTRACTOR'S employees or the WORK. At

the completion of the WORK, the CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises, as well as all tools, appliances, construction equipment, machinery and surplus materials, and shall leave the site clean and ready for occupancy by the OWNER.

The CONTRACTOR shall restore to original conditions all property (including but not limited to streets, sidewalks, drainage channels, or private property) affected by his construction operations when, in the opinion of the OWNER, such restoration is needed.

The Contract shall not be considered complete until all construction equipment and machinery, waste materials, rubbish and debris resulting from the construction are cleaned from the site of the WORK. All damage to existing paving, grounds, and structures caused by the CONTRACTOR'S operations must be repaired or the OWNER compensated for such damage before the Contract will be considered complete.

4.2 Payments Withheld

The OWNER may refuse payment to the CONTRACTOR if, in the OWNER'S or ENGINEER'S opinion such action is necessary to protect the OWNER from loss because:

The WORK is defective, or completed WORK has been damaged and requires correction or replacement;

Cleanup has not been completed;

The CONTRACT PRICE has been reduced by written amendment or CHANGE ORDER;

The OWNER has been required to correct defective WORK or complete WORK in accordance with paragraph 16.2 of the General Conditions;

Claims have been filed or reasonable evidence exists indicating the probable filing of claims;

A reasonable doubt exists that the Contract can be completed for the balance then unpaid;

Activities of the CONTRACTOR have resulted in damages to another CONTRACTOR; or

The OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 18.2.1 through 18.2.11 of the General Conditions.

The OWNER may refuse to make payment to the CONTRACTOR, in accordance with the ENGINEER'S recommendation or otherwise, for those

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reasons cited above, but the OWNER must give the CONTRACTOR immediate WRITTEN NOTICE stating the reasons for such action.

Where WORK on unit price items is complete but lacks clean up and/or corrections ordered by the OWNER or its authorized representatives, amounts shall be deducted from unit prices in payment certificates adequate to cover the cost of such clean up and corrections.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

4.3 Liens

Neither the final payment nor any part of the retained percentage shall become due until the CONTRACTOR has delivered to the OWNER effective releases or waivers, receipts, and affidavits as required by paragraph 19.4 of the General Conditions.

5. WORK BY OWNER

5.1 OWNER'S Right to Do WORK

If the CONTRACTOR should neglect to prosecute the WORK properly or fail to perform any provision of the Contract, the OWNER, in accordance with paragraph 16.2 of the General Conditions after ten (10) days WRITTEN NOTICE to the CONTRACTOR may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the CONTRACTOR.

5.2 Use of Completed Portions of WORK

The OWNER shall have the right to take possession of and use any completed or partially completed portions that constitute separately functioning and useable parts of the WORK, notwithstanding that the time for completing the entire WORK, or such portions, may not have expired; but such taking possession and use shall not be deemed an acceptance of any WORK not completed in accordance with the CONTRACT DOCUMENTS. If such prior use increases the cost of, or delays the WORK, the CONTRACTOR shall be entitled to such extra compensation, or extension of time, or both, as the OWNER may determine.

6. LIABILITY

6.1 Limit of Liability of Public Officials and OWNER'S Agents

In carrying out any of the provisions of the Contract or in exercising any power or authority granted to them thereby, there shall be no personal liability upon the ENGINEER, or the OWNER'S other consultants, agents, representatives, employees, and elected or appointed officials, it being understood that in such matters they act as the agents and representatives of the OWNER.

7. SUPERVISION BY CONTRACTOR

7.1 Character of Workmen

The CONTRACTOR shall at all times be responsible for the conduct and discipline of his employees and/or any SUBCONTRACTOR or persons employed by the SUBCONTRACTOR. All workmen must have sufficient knowledge and skill and experience to perform properly the WORK assigned to them. Any superintendent, foreman or workman employed by the CONTRACTOR, or SUBCONTRACTOR who does not perform his WORK in a skillful manner or acts in an incompetent, disorderly or intemperate manner shall, at the written request of the OWNER, be removed from working on any project of the OWNER in progress.

8. RESIDENT OBSERVER

The ENGINEER'S Resident Observer shall serve as the OWNER'S construction site representative during the construction phase, with authority to act on behalf of the OWNER, WORK with the CONTRACTOR and to further the interests of the OWNER. The Resident Observer shall:

- a. Issue FIELD ORDERS of the OWNER, as authorized by the OWNER, to the CONTRACTOR. Only the OWNER shall have the authority to issue a stop work order except in the case of an emergency.
- b. Act as the initial interpreter of terms and conditions of the CONTRACT DOCUMENTS to ensure that the DRAWINGS and SPECIFICATIONS are complied with to safeguard the OWNER against defects and deficiencies on the part of the CONTRACTOR.
- c. Observe shop, laboratory or on-site tests of equipment and materials to protect the OWNER from defects and deficiencies.
- d. Evaluate and recommend action to the OWNER on payment requisitions and payment requests.
- e. With the ENGINEER, conduct job site coordination meetings with the CONTRACTOR and the OWNER; and attend monthly Project Construction Review Meetings.
- f. Evaluate and assist in negotiating CHANGE ORDER requests.
- g. Maintain all engineering, inspection, testing and administration documents necessary to the orderly construction of the PROJECT including, but not limited to, daily and weekly reports, record drawings, time and material records, submittal logs.
- h. Conduct a final inspection to determine if the PROJECT has been completed in accordance with the CONTRACT DOCUMENTS and the CONTRACTOR has fulfilled all his obligations thereunder.

00720-6

9. CLAIMS FOR EXTRA PAYMENT FOR TIME EXTENSIONS

The CONTRACTOR'S claims for extra payment or time extensions which have not resulted from executed CHANGE ORDERS will only be considered if presented to the ENGINEER and the OWNER in accordance with the procedures outlined in Articles 13, 14 and 15 of the General Conditions.

10. QUALIFICATIONS OF PROPOSED ALTERNATIVES

- A. The specifications and project drawings depict specific equipment and materials which are deemed most suitable for the service anticipated. It is not intended, however, to eliminate other products of equal quality and performance. The contractor shall prepare his bid based on the specified equipment for purposes of determining low bid. Award of a contract shall constitute an obligation to furnish the specified equipment and materials.
- B. After execution of the contract, the contractor may offer substitutions to the specified equipment for consideration. The equipment proposed for substitution must be equal to or superior in construction and performance to that specified in the contract, and the equal or higher quality must be demonstrated by a list of current users of the proposed equipment in similar installations.
- C. In event the contractor obtains engineer's approval for equipment substitution, the contractor shall, at his own expense, make all resulting changes to the structures, piping or electrical systems as required to accommodate the proposed equipment. Revised detail drawings illustrating the substituted equipment shall be submitted to the engineer prior to acceptance.
- D. It will be assumed that if the cost to the contractor is less for the proposed substitution, then the contract price shall be reduced by an amount equal to the savings.
- E. Any changes to the installation due to the use of a manufacturer other than that called out on the drawings and specifications, will be at the Contractor's sole expense. Additional expenses may include but not be limited to structural changes, special or additional material requirements and engineering fees. No additional contract time will be granted due to a change in supplier.

END OF SECTION

00720-7

20.

PROJECT SIGN DETAIL

Sample provided – Contractor must submit wording and layout prior to fabrication for approval.

Temporary Black & White Construction Sign for projects funded by the
Department for Local Government (DLG)

Steven L. Beshear
Governor



Tony Wilder
Commissioner

Office of the Governor
Department for Local Government

**Contract #1 – KY 1098 South Fork
Waterline Project**

Project Sponsor: Breathitt County Water District
Sponsor Address: 1137 Main St., Jackson, KY 41339
Engineer: Nesbitt Engineering
Contractor:

Jason Richardson
Breathitt Co. Judge Exec.

Bobby Thorpe, Jr
Chairman Breathitt Co. Water Dist.



This project is funded by a Community
Development Block Grant administered by
the Department for Local Government and
financed by the U.S. Department of
Housing and Urban Development.
Equal Opportunity Employer

Sign Dimensions: 1200mm x 2400mm x 19 mm (app. 4' x 8' x 3/4") Plywood Panel (APA Rated A-B grade – Exterior)

21.

SPECIAL CONDITIONS

1. DESIGNATION OF OWNER AND ENGINEER

All references to the OWNER in SPECIFICATIONS, CONTRACT DOCUMENTS and DRAWINGS shall mean Breathitt County Water District, Breathitt County, Kentucky.

All references to the ENGINEER in the specifications, CONTRACT DOCUMENTS and DRAWINGS shall mean Nesbitt Engineering, Inc.

2. AVAILABLE FUNDS

2.1 The BIDDER'S attention is invited to the financing of this project, which is by means of:

- Community Development Block Grant
- Kentucky Infrastructure Authority – State Revolving Fund
- Coal Severance Funds

2.2 In the event the total cost of the construction and appurtenant WORK should exceed the amount of money available, the OWNER in making awards of CONTRACT to the successful BIDDER, may reject certain items of WORK or reduce the quantities of BID items so as to award CONTRACT within the limits of available funds. In making an award of CONTRACT to a successful BIDDER, no CONTRACTOR will be allowed any claim for loss of any anticipated profits involving any items of WORK that have been reduced or eliminated by the OWNER. Successful BIDDERS will be determined before consideration of reductions or additions to the original BID.

3. TIME OF COMPLETION

The time allowed for completion of this CONTRACT is as follows:

Contract - #1 KY 1098 Southfork Waterline - 210 Calendar Days

The time allowed for completion shall begin at midnight, local time, ten (10) calendar days from the date on which the OWNER, or its authorized representative instructs the CONTRACTOR in writing to start WORK. In case of awarding more than one CONTRACT to a CONTRACTOR, periods of construction are not additive, but will run concurrently. The same applies to divisions within a CONTRACT.

4. WEATHER DAYS

4.1 The CONTRACT completion time stipulated above includes an allowance for an average number of inclement weather days as follows:

	J	F	M	A	M	J	J	A	S	O	N	D
PRECIPITATION	11	7	8	8	8	7	9	6	5	7	6	9
FREEZE TEMP.	5	6	1	0	0	0	0	0	0	0	0	3

The number of days shown above are an average recorded over the last three years for each month's recorded weather conditions for the Jackson Weather Station and provided by the University of Kentucky Agricultural Weather Center.

When number of days (including Saturdays, Sundays, and Holidays) of precipitation in excess of 0.1" per day or maximum daily temperatures of 32° F exceed those shown above in any month, the CONTRACTOR shall be entitled to an equal number of additional days for CONTRACT completion.

4.2 If, in the ENGINEER'S opinion, sustained bad weather conditions prevent satisfactory performance of the WORK, the ENGINEER may suspend operations for an extended period until weather conditions are favorable. In this event, CONTRACT completion time shall be extended an equal number of days. Upon suspension of the WORK by the ENGINEER, the CONTRACTOR shall properly protect his WORK during the suspension period.

5. LIQUIDATED DAMAGES

It is understood that time is the essence of this CONTRACT, and that the OWNER will sustain damages, monetary and otherwise, in the event of delay in completion of the WORK hereby CONTRACTED.

Therefore, if the CONTRACTOR shall neglect, fail or refuse to complete the WORK within the time herein specified, or any proper extension thereof granted by the OWNER, then the CONTRACTOR does hereby agree, as a part consideration for the awarding of this CONTRACT, to pay to the OWNER the amount specified in the CONTRACT, not as a penalty but as liquidated damages for such breach of CONTRACT as hereinafter set forth, for each and every calendar day the CONTRACTOR shall be in default after the time stipulated in the CONTRACT for completing the WORK.

The said amount is fixed and agreed upon by and between the CONTRACTOR and the OWNER because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER would in such event sustain, and said amount is agreed to be the amount of damages which the OWNER should sustain and said amount shall be retained from time to time by the OWNER from current periodical estimates.

Liquidated damages are fixed at the following amount per calendar day of overrun beyond the date set for completion or authorized extension thereof for the CONTRACT:

\$750.00 Per Calendar Day

6. EVALUATION OF BIDS AND AWARD OF CONTRACT

6.1 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

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

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

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

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

6.6 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.

7. INSURANCE

The minimum amount of insurance to be furnished by the CONTRACTOR shall be in accordance with the more stringent requirements of Paragraphs 21 and 28 of the RD and CDBG General Conditions, respectively, and this Section 5. Said insurance shall be for the joint protection of the CONTRACTOR, OWNER, and ENGINEER. Insurance against all damage from blasting shall be included in the policies.

All policies written for and applicable to the CONTRACT of which this specification is a part shall provide for a minimum of thirty (30) days advance written notice by certified mail of cancellation or any material change. Notice shall be given both to the OWNER and the ENGINEER. The minimum amounts:

- (1) **Worker's Compensation:** The CONTRACTOR shall procure and shall maintain during the life of the CONTRACT, Worker's Compensation Insurance for all of CONTRACTOR'S employees to be engaged in the WORK under this CONTRACT, and in case where the WORK is sublet, the CONTRACTOR shall require the SUBCONTRACTOR similarly to provide Worker's Compensation Insurance. Worker's Compensation Insurance shall include Broad Form All States Endorsement and Voluntary Compensation.

Each Accident	\$100,000.00
Disease - Policy Limit	\$500,000.00
Disease - Each Employee	\$100,000.00

- (2) **Comprehensive General Liability:** The CONTRACTOR shall procure and shall maintain during the life of the CONTRACT, such Comprehensive General Liability and Broad Form Property Damage Insurance as shall protect CONTRACTOR and any SUBCONTRACTOR performing WORK from claims for damages for bodily injury, including accidental death, as well as from claims for property damages, which may arise from operations under the CONTRACT, whether such operations are by the CONTRACTOR or by any SUBCONTRACTOR or by anyone directly or indirectly employed by either of them. The amount of insurance shall not be less than the following:

General Aggregate	\$1,000,000.00
Products Comp/Ops Aggregate	\$1,000,000.00
Personal and Advertising Injury	\$1,000,000.00
Each Occurrence	\$1,000,000.00
Fire Damage (Any one fire)	\$ 50,000.00
Medical Expenses (Any one person)	\$ 5,000.00

The insurance shall include coverage of the following hazards:

Underground
Explosion/Collapse

For the purpose of insurance coverage, each detonation of blasting is a single occurrence.

- (3) **OWNER'S and CONTRACTOR'S Protective Liability:** The CONTRACTOR shall maintain during the life of the CONTRACT, OWNER'S and CONTRACTOR'S Protective Liability Insurance with the same limits as the Comprehensive General Liability.
- (4) **Automobile Liability:** The CONTRACTOR shall procure and shall maintain during the life of the CONTRACT Agreement, Comprehensive Automobile Liability Insurance. The insurance shall include coverage for owned, non-owned and hired vehicles. Amounts shall not be less than the following:

Comprehensive Single Limits (CSL) \$1,000,000.00

- (5) **Builder's Risk:** The CONTRACTOR shall procure and shall maintain during the life of the CONTRACT, Builder's Risk Insurance to protect the interests of the OWNER, CONTRACTOR, and SUBCONTRACTORS against loss by fire, vandalism, malicious mischief, and all hazards included in a standard special form cover. The amount of the insurance shall at all times equal or exceed the full amount of the CONTRACT. The policies shall be in the names of the OWNER and the CONTRACTOR and SUBCONTRACTOR.
 - (6) **Umbrella Excess Liability \$1,000,000.00 Per Occurrence (With no aggregate except products completed operations).**
 - (7) **Certificates of Insurance:** Certificates acceptable to the OWNER shall be attached to the signed CONTRACT DOCUMENTS when they are transmitted to the OWNER for execution. These certificates shall contain the statement that "Coverages afforded under the policies will not be canceled unless at least thirty (30) days prior to cancellation written notice has been given to the OWNER and ENGINEER, as evidenced by receipts of registered or certified mail." The OWNER shall be a named insured.
8. **PERFORMANCE AND PAYMENT BONDS**

The CONTRACTOR shall furnish separate performance and payment BONDS (forms included elsewhere in these Specifications) issued by an approved bonding company, in an amount at least equal to one-hundred percent (100%) of the CONTRACT PRICE, as security for the faithful performance of this CONTRACT and for the payment of persons performing labor and furnishing materials in connection with this CONTRACT. These BONDS shall be executed by a surety authorized to do business in the Commonwealth of Kentucky.

A Performance Bond and a Payment Bond on any other form than the ones attached will not be acceptable. The Surety Bond will and ensure payment of all unemployment contributions required under the Unemployment Insurance laws of the Commonwealth of Kentucky and of the Federal Government.

9. **METHOD OF BIDDING**

The method of bidding under this CONTRACT shall be by lump sum and/or unit price as shown on the Proposal form.

The method of award is to the low responsive, responsible bidder unless all bids are rejected. Refer to 40 CFR 31.36(d). All bids shall not be rejected without proper justification.

10. **PERMISSION TO USE PROPERTY OTHER THAN THAT PROVIDED BY OWNER**

Should the CONTRACTOR desire or elect to use, pass over and/or encroach on private property other than that provided by the OWNER, either by fee simple title or

right-of-way for a specific purpose, the CONTRACTOR shall obtain such rights and permission from the legal owner of said private property at his own expense and risk.

11. **ROCK SOUNDING**

Excavation is unclassified. The CONTRACTOR shall be responsible for the determination of the amount of rock excavation required.

12. **OWNER FURNISHED EQUIPMENT AND MATERIALS**

There will be no OWNER furnished equipment or materials for installation in this CONTRACT.

13. **SUBCONTRACTOR LISTING**

In the event the CONTRACTOR contemplates subletting WORK on the CONTRACT, he shall list the SUBCONTRACTOR names and addresses on the attachment provided with the BID form.

Failure on the part of the bidding CONTRACTOR to list SUBCONTRACTORS or write the WORK "None" (if no SUBCONTRACTOR is to be used) may, at the option of the OWNER be cause for rejection of the CONTRACTOR'S BID. SUBCONTRACTOR, as listed by the CONTRACTOR on his bidding form, may not be changed without approval of the OWNER.

14. **SCHEDULING OF CONSTRUCTION ACTIVITIES**

The CONTRACTOR shall, in writing, closely schedule all construction activities of the WORK with a representative of the OWNER specifically designated to provide the customers of the OWNER a minimum five-working-day notification of the impending construction activities of the CONTRACTOR. The CONTRACTOR and the representative of the OWNER shall meet on a daily basis to review the completion progress of previously scheduled construction activities and to estimate specific locations of the CONTRACTOR'S construction activity for the subsequent five (5) working day period. No unscheduled construction activities shall be performed by the CONTRACTOR unless otherwise directed by the OWNER.

Where the WORK requires construction activities adjacent to existing treatment or pumping facilities, the CONTRACTOR shall not interrupt the operation of these facilities and shall provide the OWNER'S operations staff continuous, safe access to such parts of the affected facilities.

The CONTRACTOR will comply with OSHA (P.L. 91-596), the CONTRACT WORK hours and the Safety Standards Act (P.L. 91-54).

15. **RESPONSIBILITY REGARDING EXISTING UTILITIES AND STRUCTURES**

15.1 The existence and location of underground utilities indicated on the PLANS are not guaranteed and shall be investigated and verified in the field by the

CONTRACTOR before starting WORK. Excavation in the vicinity of existing structures and utilities shall be carefully done by hand labor.

- 15.2 The CONTRACTOR shall be held responsible for any damage to, and for maintenance and protection of, existing utilities and structures.

16. ACCIDENTS

The CONTRACTOR must promptly report, in writing, to the ENGINEER all accidents whatsoever arising out of, or in connection with, the performance of the WORK, whether on, or adjacent to, the site which caused death, personal injury, or property damages, giving full details and statements of witnesses. In addition if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the ENGINEER and the OWNER.

17. FINAL PAYMENT

- 17.1 Within thirty (30) days after final inspection and acceptance of the WORK by the ENGINEER and the OWNER, the final estimate for all WORK done, including all retained percentage, shall be compiled by the ENGINEER and furnished to the OWNER. Upon the latter's approval, either in whole or in part, the amount of money thus found due the CONTRACTOR, after all previous payments and other claims, if any are deducted, will be certified for payment, but before final payment is made to any CONTRACTOR on any OWNER or portion thereof, the CONTRACTOR will be required to satisfy the OWNER to the effect that all claims for labor done on the CONTRACT and all material put into the WORK have been fully paid or satisfactorily secured; and the OWNER shall be held harmless by the CONTRACTOR and the SURETY on his BOND from the payment of any money paid under the belief that said claims for labor and materials are not to be prejudiced by any mistaken payment. The acceptance by the CONTRACTOR of payment of the said final estimate shall operate as and shall be a release to the OWNER.

18. RIGHTS OF WAY

Rights of way and easements will be provided by the OWNER.

19. PROTECTION OF THE PROPERTY OF LANDOWNERS

- 19.1 The CONTRACTOR and all his employees shall exercise care and consideration in traveling over the lands of private property owners from whom rights-of-way and easements were obtained
- 19.2 The CONTRACTOR should likewise use existing roads as much as possible to transport pipe, other materials, and workmen to and from the job.
- 19.3 Carelessness on the part of the CONTRACTOR or any of his employees in leaving gates open, parking cars, trucks or vehicles in such a way as to interfere with farming operations will not be tolerated.

- 19.4 The CONTRACTOR shall deliver materials to the site of the WORK and so conduct his operations in such a manner as to cause no damage to trees, buildings, outbuildings, and other property of landowners.
- 19.5 Trees, fences, poles, and all other property shall be protected unless their removal is authorized by the ENGINEER. Any damaged property shall be restored to as near original condition as possible by the CONTRACTOR.
- 19.6 Reasonable care shall be taken during construction to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with tree dressing.

20. **TEMPORARY UTILITIES**

CONTRACTORS shall provide for all utilities, including water, needed during construction.

21. **CONTRACTOR'S RESPONSIBILITY FOR MATERIALS**

- 21.1 **Responsibility for Materials Furnished by CONTRACTOR:** The CONTRACTOR shall be responsible for all material furnished by him. All such material which is defective in manufacture or has been damaged in transit or in delivery shall be replaced by the CONTRACTOR at his expense.
- 21.2 **Responsibility for Materials Furnished by OWNER:** The CONTRACTOR'S responsibility for material furnished by the OWNER shall begin upon CONTRACTOR'S acceptance at the point of delivery to him. All such material shall be examined and material defective in manufacture, or damaged in shipment, and/or otherwise damaged, shall be rejected by the CONTRACTOR at the time and place of delivery to him and replaced by the OWNER. Material furnished by the OWNER which is accepted by the CONTRACTOR, but which is discovered prior to acceptance of the WORK (1) to be defective in manufacture shall be replaced by the OWNER, (2) to have been damaged before or after acceptance by the CONTRACTOR, shall be replaced by the CONTRACTOR. Once accepted by the CONTRACTOR at the point of delivery to him, all defective and/or damaged material discovered prior to final acceptance of the WORK shall be removed by the CONTRACTOR. In such case, the CONTRACTOR shall furnish all labor, equipment and material incidental to replacement and necessary for the completion of the WORK to the satisfaction of the ENGINEER.
- 21.3 **Responsibility for Safe Storage:** The CONTRACTOR shall be responsible for the safe storage of all material furnished to or by him and accepted by him until it has been incorporated in the completed project.

22. **MINIMUM WAGE RATES**

State and Federal wage rates are applicable on this project.

23. **PROJECT SIGNS**

Two (2) project signs shall be provided by the CONTRACTOR as described at the end of the supplemental General Conditions section. The sign layout shall be approved by the ENGINEER and shall be placed where directed by the ENGINEER in the field.

24. **Certificate of Good Standing from the Secretary of State's (SOS) Office -**

A printed copy from the web site of the SOS (<http://www.sos.state.ky.us/corporate2/entityname.asp>), which indicates the corporation/partnership, has a Standing of **Good** shall be submitted with the bid.

25. **Pipe Cover** - Per the Kentucky Transportation Cabinets (KTC) Encroachment Permit, all lines constructed within State Right-of-Way (ROW), shall have a minimum cover of 42" above the top of the pipe. Also, the boring pit shall be constructed according to KTC requirements. In areas off the KTC ROW the minimum cover shall be thirty inches (30") unless specifically shown otherwise on the plan sheets.

26. **Encroachment Permit Bond** – The successful CONTRACTOR SHALL obtain the encroachment bond and then the OWNER will reimburse the CONTRACTOR for the KTC Encroachment Bond upon submittal of a copy of the bond and check paying for the bond.

27. **Trench Width** – The trench width shall be as shown in the Standard Details, except in rock. In rock the minimum distance from the pipe OD to the trench wall shall be between four to six inches (4 – 6").

28. **Change Orders** – Change orders to the construction contract must comply with DOW Procurement Guidance for Construction and Equipment Contracts. This contract requires cost, pricing, and certification for change orders exceeding \$100,000 as required by DOW Procurement Guidance for Construction and Equipment Contracts.

29. **Service Lines** – All service lines shall be ¾-inch 200 psi Polyethylene tubing unless specifically shown otherwise on the plans.

30. **Occupational Tax/License** - The CONTRACTOR shall verify all requirements and make all necessary payments with the Breathitt County Treasurer.

31. **Tree Removal** – Trees shall only be removed during the time period from October 15th through March 31st, unless other provisions have been made.

END OF SECTION

SECTION 22

SUPPLEMENTAL GENERAL CONDITIONS

FOR

CLEAN WATER STATE REVOLVING FUND

DRINKING WATER STATE REVOLVING FUND

EPA SPECIAL APPROPRIATION GRANTS

(Drinking Water and Wastewater)

Project Name: **KY 1098 South Fork Waterline**
 Extension

Project Number: **F11-07**

The attached instructions and regulations as listed below shall be incorporated into the Specifications and comprise Special Conditions.

	<u>Attachment No.</u>
SRF/EPA Special Provisions	1
Requirements for Sub-agreements Awarded by Prime Contractors	2
40 CFR 31.36 (Procurement)-grants only	3A
KRS Chapter 45A-Kentucky Model Procurement Code-loans only	3B
Equal Employment Opportunity (EEO) Documents:	
Notice of Requirement for Affirmative Action	4
Contract Specifications (Executive Order 11246)	5
EEO Goals for Region 4 Economic Areas	6
Special Notice #1 - Check List of EEO Documentation	7
Employer Information Report EEO-1 (SF 100)	8
Labor Standards Provisions for Federally Assisted Construction, EPA Form 5720-4	9
Certifications	
Debarment, Suspension and Other Responsibility Matters	10
Anti-lobbying	11
Region 4 Disadvantaged Business Enterprise (DBE)	12
Negotiated Rates as of October 1, 2006	13
Bonds and Insurance	14
Outlay Management Schedule	15

Storm Water General Permit	16
Wage Rates	17

Attachment Number 1

EPA SPECIAL PROVISIONS

- a) The construction of the project shall conform to the applicable requirements for state, territorial and local laws and ordinances to the extent that such requirements do not conflict with Federal laws.
- b) The EPA shall have access to the site and the project.
- c) Any contract(s) awarded under this invitation for Bids are expected to be funded in part by a grant from the U.S. Environmental Protection Agency. Neither the United States nor any of its departments, agencies or employees are or will be a part to this Invitation for Bids or any resulting contract.
- d) The Method of Award is to the lowest responsible responsive bidder.
- e) A statement that the bidder must make positive efforts to use small and minority owned business and women business enterprises.

SRF SPECIAL PROVISIONS

- (a) Line crossings of all roads and streets shall be done in accordance with the Kentucky Transportation Cabinet requirements as may be set forth in the Special Conditions.
- (b) Construction is to be carried out so as to prevent by-passing of flows during construction unless a schedule has been approved by the State or EPA, whichever is applicable.
- (c) Siltation and soil erosion must be minimized during construction. All construction projects with surface disturbance of more than 1 acre during the period of construction must have a KPDES Storm Water General Permit. To apply, the contractor must submit the "Notice of Intent" form at least 48 hours prior to start of construction. See Attachment 16 for the "Notice of Intent" form.
- (d) Restore disturbed areas to original or better condition.
- (e) Use of Chemicals: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of either DOW or EPA. Use of all such chemicals and disposal of residues shall be in conformance with instructions on the manufacturer's label.
- (f) The construction of the project, including the letting of contracts in connection therewith, shall conform to the applicable requirements of state, territorial, and local laws and ordinances to the extent that such requirements do not conflict with Federal laws and this subchapter.
- (g) The owner shall provide and maintain competent and adequate supervision and inspection.
- (h) The Kentucky Infrastructure Authority and Kentucky Division of Water shall have access to the site and the project work at all times.
- (i) In the event Archaeological materials (arrowheads, stone tools, stone axes, prehistoric and historic pottery, bottles, foundations, Civil War artifacts, and other types of artifacts) are uncovered during the construction of this project, work is to immediately cease at the

location and the Kentucky Heritage Council shall be contacted. The telephone number is (502) 564-7005. Construction shall commence at this location until a written release is received from the Kentucky Heritage Council. Failure to report a find could result in legal action.

Attachment Number 2

GRANT REQUIREMENTS FOR SUB-AGREEMENTS
AWARDED BY A PRIME CONTRACTOR

A contractor must comply with the following provisions in its award of sub-agreements. (This section does not apply to a supplier's procurement of materials to produce equipment, materials and catalog, off-the-shelf, or manufactured items.)

- (a) 40 CFR Part 32 (Debarment and Suspension Under EPA Assistance Programs);
- (b) The limitations and sub-agreement award in 40 CFR 31.35, and 31.36(i) (3,4,6,10,12) ;
- (c) The requirement for small, small rural, minority, women's and labor surplus area business in 40 CFR 31.36(e);
- (d) The specifications requirements of 40 CFR 31.36(c) (1);
- (e) The Federal cost principles in 40 CFR 31.22 and 31.36(f)(3);
- (f) The prohibited types of sub-agreements in 40 CFR 31.36(f)(4);
- (g) 40 CFR Part 34 (Anti-Lobbying under EPA Assistance Programs).

Attachment Number 3A

**TITLE 40--PROTECTION OF ENVIRONMENT
CHAPTER I--ENVIRONMENTAL PROTECTION AGENCY**

**PART 31--UNIFORM ADMINISTRATIVE REQUIREMENTS FOR GRANTS AND
COOPERATIVE AGREEMENTS TO STATE AND LOCAL GOVERNMENTS**

Subpart C--Post-Award Requirements

Sec. 31.36 Procurement.

(a) States. When procuring property and services under a grant, a State will follow the same policies and procedures it uses for procurements from its non-Federal funds. The State will ensure that every purchase order or other contract includes any clauses required by Federal statutes and executive orders and their implementing regulations. Other grantees and sub-grantees will follow paragraphs (b) through (i) in this section.

(b) Procurement standards. (1) Grantees and sub-grantees will use their own procurement procedures which reflect applicable State and local laws and regulations, provided that the procurements conform to applicable federal law, the standards identified in this section, and if applicable, Sec. 31.38.

(2) Grantees and sub-grantees will maintain a contract administration system which ensures that contractors perform in accordance with the terms, conditions, and specifications of their contracts or purchase orders.

(3) Grantees and sub-grantees will maintain a written code of standards of conduct governing the performance of their employees engaged in the award and administration of contracts. No employee, officer or agent of the grantee or sub-grantee shall participate in selection, or in the award or administration of a contract supported by Federal funds 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 his immediate family,

(iii) His or her partner, or

(iv) An organization which employs, or is about to employ, any of the above, has a financial or other interest in the firm selected for award. The grantee's or sub-grantee's officers, employees or agents will neither solicit nor accept gratuities, favors or anything of monetary value from contractors, potential contractors, or parties to sub-agreements. Grantee and sub-grantees may set minimum rules where the financial interest is not substantial or the gift is an unsolicited item of nominal intrinsic value. To the extent permitted by State or local law or regulations, such standards or conduct will provide for penalties, sanctions, or other disciplinary actions for violations of such standards by the grantee's and sub-grantee's officers, employees, or agents, or by contractors or their agents. The awarding agency may in regulation provide additional prohibitions relative to real, apparent, or potential conflicts of interest.

(4) Grantee and sub-grantee procedures will provide for a review of proposed procurements to avoid purchase of unnecessary or duplicative items. Consideration should be given to consolidating or breaking out procurements to obtain a more economical purchase. Where appropriate, an analysis will be made of lease versus purchase alternatives, and any other appropriate analysis to determine the most economical approach.

(5) To foster greater economy and efficiency, grantees and sub-grantees are encouraged to enter into State and local intergovernmental agreements for procurement or use of common goods and services.

(6) Grantees and sub-grantees are encouraged to use Federal excess and surplus property in lieu of purchasing new equipment and property whenever such use is feasible and reduces project costs.

- (7) Grantees and sub-grantees are encouraged to use value engineering clauses in contracts for construction projects of sufficient size to offer reasonable opportunities for cost reductions. Value engineering is a systematic and creative analysis of each contract item or task to ensure that its essential function is provided at the overall lower cost.
- (8) Grantees and sub-grantees will make awards only to responsible contractors possessing the ability to perform successfully under the terms and conditions of a proposed procurement. Consideration will be given to such matters as contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.
- (9) Grantees and sub-grantees will maintain records sufficient to detail the significant history of a procurement. These records will include, but are not necessarily limited to the following: rationale for the method of procurement, selection of contract type, contractor selection or rejection, and the basis for the contract price.
- (10) Grantees and sub-grantees will use time and material type contracts only--
- (i) After a determination that no other contract is suitable, and
 - (ii) If the contract includes a ceiling price that the contractor exceeds at its own risk.
- (11) Grantees and sub-grantees alone will be responsible, in accordance with good administrative practice and sound business judgment, for the settlement of all contractual and administrative issues arising out of procurements. These issues include, but are not limited to source evaluation, protests, disputes, and claims. These standards do not relieve the grantee or sub-grantee of any contractual responsibilities under its contracts. Federal agencies will not substitute their judgment for that of the grantee or sub-grantee unless the matter is primarily a Federal concern. Violations of law will be referred to the local, State, or Federal authority having proper jurisdiction.
- (12) Grantees and sub-grantees will have protest procedures to handle and resolve disputes relating to their procurements and shall in all instances disclose information regarding the protest to the awarding agency. A protestor must exhaust all administrative remedies with the grantee and sub-grantee before pursuing a protest with the Federal agency. Reviews of protests by the Federal agency will be limited to:
- (i) Violations of Federal law or regulations and the standards of this section (violations of State or local law will be under the jurisdiction of State or local authorities) and
 - (ii) Violations of the grantee's or sub-grantee's protest procedures for failure to review a complaint or protest. Protests received by the Federal agency other than those specified above will be referred to the grantee or sub-grantee.
- (c) Competition. (1) All procurement transactions will be conducted in a manner providing full and open competition consistent with the standards of Sec. 31.36. Some of the situations considered to be restrictive of competition include but are not limited to:
- (i) Placing unreasonable requirements on firms in order for them to qualify to do business,
 - (ii) Requiring unnecessary experience and excessive bonding,
 - (iii) Noncompetitive pricing practices between firms or between affiliated companies,
 - (iv) Noncompetitive awards to consultants that are on retainer contracts,
 - (v) Organizational conflicts of interest,
 - (vi) Specifying only a "brand name" product instead of allowing "an equal" product to be offered and describing the performance of other relevant requirements of the procurement, and
 - (vii) Any arbitrary action in the procurement process.
- (2) Grantees and sub-grantees will conduct procurements in a manner that prohibits the use of statutorily or administratively imposed in-State or local geographical preferences in the evaluation of bids or proposals, except in those cases where applicable Federal statutes expressly mandate or encourage geographic preference. Nothing in this section preempts State licensing laws. When contracting for architectural and engineering (A/E) services, geographic location may be a selection criteria provided its application leaves an appropriate number of qualified firms, given the nature and size of the project, to compete for the contract.

(3) Grantees will have written selection procedures for procurement transactions. These procedures will ensure that all solicitations:

(i) Incorporate a clear and accurate description of the technical requirements for the material, product, or service to be procured. Such description shall not, in competitive procurements, contain features, which unduly restrict competition. The description may include a statement of the qualitative nature of the material, product or service to be procured, and when necessary, shall set forth those minimum essential characteristics and standards to which it must conform if it is to satisfy its intended use.

Detailed product specifications should be avoided if at all possible. When it is impractical or uneconomical to make a clear and accurate description of the technical requirements, a "brand name or equal" description may be used as a means to define the performance or other salient requirements of a procurement. The specific features of the named brand which must be met by offerers shall be clearly stated; and

(ii) Identify all requirements which the offerers must fulfill and all other factors to be used in evaluating bids or proposals.

(4) Grantees and sub-grantees will ensure that all pre-qualified lists of persons, firms, or products which are used in acquiring goods and services are current and include enough qualified sources to ensure maximum open and free competition. Also, grantees and sub-grantees will not preclude potential bidders from qualifying during the solicitation period.

(5) Construction grants awarded under Title II of the Clean Water Act are subject to the following "Buy American" requirements in paragraphs (c)(5) (i)-(iii) of this section. Section 215 of the Clean Water Act requires that contractors give preference to the use of domestic material in the construction of EPA-funded treatment works.

(i) Contractors must use domestic construction materials in preference to nondomestic material if it is priced no more than 6 percent higher than the bid or offered price of the nondomestic material, including all costs of delivery to the construction site and any applicable duty, whether or not assessed. The grantee will normally base the computations on prices and costs in effect on the date of opening bids or proposals.

(ii) The award official may waive the Buy American provision based on factors the award official considers relevant, including:

(A) Such use is not in the public interest;

(B) The cost is unreasonable;

(C) The Agency's available resources are not sufficient to implement the provision, subject to the Deputy Administrator's concurrence;

(D) The articles, materials or supplies of the class or kind to be used or the articles, materials or supplies from which they are manufactured are not mined, produced or manufactured in the United States in sufficient and reasonably available commercial quantities or satisfactory quality for the particular project; or

(E) Application of this provision is contrary to multilateral government procurement agreements, subject to the Deputy Administrator's concurrence.

(iii) All bidding documents, subagreements, and, if appropriate, requests for proposals must contain the following "Buy American" provision: In accordance with section 215 of the Clean Water Act (33 U.S.C. 1251 et seq.) and implementing EPA regulations, the contractor agrees that preference will be given to domestic construction materials by the contractor, subcontractors, materialmen and suppliers in the performance of this subagreement.

(d) Methods of procurement to be followed--(1) Procurement by small purchase procedures. Small purchase procedures are those relatively simple and informal procurement methods for securing services, supplies, or other properties that do not cost more than the simplified acquisition threshold

fixed at 41 U.S.C. 403(11) (currently set at \$100,000). If small purchase procedures are used, price or rate quotations shall be obtained from an adequate number of qualified sources.

(2) Procurement by sealed bids (formal advertising). Bids are publicly solicited and a firm-fixed-price contract (lump sum or unit price) is awarded to the responsible bidder whose bid, conforming with all the material terms and conditions of the invitation for bids, is the lowest in price. The sealed bid method is the preferred method for procuring construction, if the conditions in 31.36(d)(2)(i) apply.

(i) In order for sealed bidding to be feasible, the following conditions should be present:

(A) A complete, adequate, and realistic specification or purchase description is available;

(B) Two or more responsible bidders are willing and able to compete effectively and for the business; and

(C) The procurement lends itself to a firm fixed price contract and the selection of the successful bidder can be made principally on the basis of price.

(ii) If sealed bids are used, the following requirements apply:

(A) The invitation for bids will be publicly advertised and bids shall be solicited from an adequate number of known suppliers, providing them sufficient time prior to the date set for opening the bids;

(B) The invitation for bids, which will include any specifications and pertinent attachments, shall define the items or services in order for the bidder to properly respond;

(C) All bids will be publicly opened at the time and place prescribed in the invitation for bids;

(D) A firm fixed-price contract award will be made in writing to the lowest responsive and responsible bidder. Where specified in bidding documents, factors such as discounts, transportation cost, and life cycle costs shall be considered in determining which bid is lowest. Payment discounts will only be used to determine the low bid when prior experience indicates that such discounts are usually taken advantage of; and

(E) Any or all bids may be rejected if there is a sound documented reason.

(3) Procurement by competitive proposals. The technique of competitive proposals is normally conducted with more than one source submitting an offer, and either a fixed-price or cost-reimbursement type contract is awarded. It is generally used when conditions are not appropriate for the use of sealed bids. If this method is used, the following requirements apply:

(i) Requests for proposals will be publicized and identify all evaluation factors and their relative importance. Any response to publicized requests for proposals shall be honored to the maximum extent practical;

(ii) Proposals will be solicited from an adequate number of qualified sources;

(iii) Grantees and sub-grantees will have a method for conducting technical evaluations of the proposals received and for selecting awardees;

(iv) Awards will be made to the responsible firm whose proposal is most advantageous to the program, with price and other factors considered; and

(v) Grantees and sub-grantees may use competitive proposal procedures for qualifications-based procurement of architectural/engineering (A/E) professional services whereby competitors' qualifications are evaluated and the most qualified competitor is selected, subject to negotiation of fair and reasonable compensation. The method, where price is not used as a selection factor, can only be used in procurement of A/E professional services. It cannot be used to purchase other types of services though A/E firms are a potential source to perform the proposed effort.

(4) Procurement by noncompetitive proposals is procurement through solicitation of a proposal from only one source, or after solicitation of a number of sources, competition is determined inadequate.

(i) Procurement by noncompetitive proposals may be used only when the award of a contract is infeasible under small purchase procedures, sealed bids or competitive proposals and one of the following circumstances applies:

(A) The item is available only from a single source;

(B) The public exigency or emergency for the requirement will not permit a delay resulting from competitive solicitation;

(C) The awarding agency authorizes noncompetitive proposals; or

(D) After solicitation of a number of sources, competition is determined inadequate.

(ii) Cost analysis, i.e., verifying the proposed cost data, the projections of the data, and the evaluation of the specific elements of costs and profits, is required.

(iii) Grantees and sub-grantees may be required to submit the proposed procurement to the awarding agency for pre-award review in accordance with paragraph (g) of this section.

(e) Contracting with small and minority firms, women's business enterprise and labor surplus area firms.

(1) The grantee and sub-grantee will take all necessary affirmative steps to assure that minority firms, women's business enterprises, and labor surplus area firms are used when possible.

(2) Affirmative steps shall include:

(i) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(ii) Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;

(iii) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority business, and women's business enterprises;

(iv) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority business, and women's business enterprises;

(v) Using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the Department of Commerce; and

(vi) Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in paragraphs (e)(2) (i) through (v) of this section.

(f) Contract cost and price.

(1) Grantees and sub-grantees must perform a cost or price analysis in connection with every procurement action including contract modifications. The method and degree of analysis is dependent on the facts surrounding the particular procurement situation, but as a starting point, grantees must make independent estimates before receiving bids or proposals. A cost analysis must be performed when the offerer is required to submit the elements of his estimated cost, e.g., under professional, consulting, and architectural engineering services contracts. A cost analysis will be necessary when adequate price competition is lacking, and for sole source procurements, including contract modifications or change orders, unless price reasonableness can be established on the basis of a catalog or market price of a commercial product sold in substantial quantities to the general public or based on prices set by law or regulation. A price analysis will be used in all other instances to determine the reasonableness of the proposed contract price.

(2) Grantees and sub-grantees will negotiate profit as a separate element of the price for each contract in which there is no price competition and in all cases where cost analysis is performed.

To establish a fair and reasonable profit, consideration will be given to the complexity of the work to be performed, the risk borne by the contractor, the contractor's investment, the amount of subcontracting, the quality of its record of past performance, and industry profit rates in the surrounding geographical area for similar work.

(3) Costs or prices based on estimated costs for contracts under grants will be allowable only to the extent that costs incurred or cost estimates included in negotiated prices are consistent with Federal cost principles (see Sec. 31.22). Grantees may reference their own cost principles that comply with the applicable Federal cost principles.

(4) The cost plus a percentage of cost and percentage of construction cost methods of contracting shall not be used.

(g) Awarding agency review.

(1) Grantees and sub-grantees must make available, upon request of the awarding agency, technical specifications on proposed procurements where the awarding agency believes such review is needed to ensure that the item and/or service specified is the one being proposed for purchase. This review generally will take place prior to the time the specification is incorporated into a solicitation

document. However, if the grantee or sub-grantee desires to have the review accomplished after a solicitation has been developed, the awarding agency may still review the specifications, with such review usually limited to the technical aspects of the proposed purchase.

(2) Grantees and sub-grantees must on request make available for awarding agency pre-award review procurement documents, such as requests for proposals or invitations for bids, independent cost estimates, etc. when:

- (i) A grantee's or sub-grantee's procurement procedures or operation fails to comply with the procurement standards in this section; or
- (ii) The procurement is expected to exceed the simplified acquisition threshold and is to be awarded without competition or only one bid or offer is received in response to a solicitation; or
- (iii) The procurement, which is expected to exceed the simplified acquisition threshold, specifies a "brand name" product; or
- (iv) The proposed award is more than the simplified acquisition threshold and is to be awarded to other than the apparent low bidder under a sealed bid procurement; or
- (v) A proposed contract modification changes the scope of a contract or increases the contract amount by more than the simplified acquisition threshold.

(3) A grantee or sub-grantee will be exempt from the pre-award review in paragraph (g)(2) of this section if the awarding agency determines that its procurement systems comply with the standards of this section.

(i) A grantee or sub-grantee may request that its procurement system be reviewed by the awarding agency to determine whether its system meets these standards in order for its system to be certified. Generally, these reviews shall occur where there is a continuous high-dollar funding, and third-party contracts are awarded on a regular basis.

(ii) A grantee or sub-grantee may self-certify its procurement system. Such self-certification shall not limit the awarding agency's right to survey the system. Under a self-certification procedure, awarding agencies may wish to rely on written assurances from the grantee or sub-grantee that it is complying with these standards. A grantee or sub-grantee will cite specific procedures, regulations, standards, etc., as being in compliance with these requirements and have its system available for review.

(h) Bonding requirements. For construction or facility improvement contracts or subcontracts exceeding the simplified acquisition threshold, the awarding agency may accept the bonding policy and requirements of the grantee or sub-grantee provided the awarding agency has made a determination that the awarding agency's interest is adequately protected. If such a determination has not been made, the minimum requirements shall be as follows:

(1) A minimum bid guarantee from each bidder equivalent to five percent of the bid price. The "bid guarantee" shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his bid, execute such contractual documents as may be required within the time specified.

(2) A performance bond on the part of the contractor for 100 percent of the contract price. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.

(3) A payment bond on the part of the contractor for 100 percent of the contract price. A "payment bond" is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

(i) Contract provisions. A grantee's and sub-grantee's contracts must contain provisions in paragraph (i) of this section. Federal agencies are permitted to require changes, remedies, changed conditions, access and records retention, suspension of work, and other clauses approved by the Office of Federal Procurement Policy.

(1) Administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as may be appropriate.
(Contracts more than the simplified acquisition threshold)

- (2) Termination for cause and for convenience by the grantee or sub-grantee including the manner by which it will be effected and the basis for settlement. (All contracts in excess of \$10,000)
 - (3) Compliance with Executive Order 11246 of September 24, 1965, entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR chapter 60). (All construction contracts awarded in excess of \$10,000 by grantees and their contractors or sub-grantees)
 - (4) Compliance with the Copeland "Anti-Kickback" Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR part 3). (All contracts and sub-grants for construction or repair)
 - (5) Compliance with the Davis-Bacon Act (40 U.S.C. 276a to 276a-7) as supplemented by Department of Labor regulations (29 CFR part 5). (Construction contracts in excess of \$2000 awarded by grantees and sub-grantees when required by Federal grant program legislation)
 - (6) Compliance with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by Department of Labor regulations (29 CFR part 5). (Construction contracts awarded by grantees and sub-grantees in excess of \$2000, and in excess of \$2500 for other contracts which involve the employment of mechanics or laborers)
 - (7) Notice of awarding agency requirements and regulations pertaining to reporting.
 - (8) Notice of awarding agency requirements and regulations pertaining to patent rights with respect to any discovery or invention which arises or is developed in the course of or under such contract.
 - (9) Awarding agency requirements and regulations pertaining to copyrights and rights in data.
 - (10) Access by the grantee, the sub-grantee, the Federal grantor agency, the Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers, and records of the contractor which are directly pertinent to that specific contract for the purpose of making audit, examination, excerpts, and transcriptions.
 - (11) Retention of all required records for three years after grantees or sub-grantees make final payments and all other pending matters are closed.
 - (12) Compliance with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h)), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR part 15). (Contracts, subcontracts, and sub-grants of amounts in excess of \$100,000)
 - (13) Mandatory standards and policies relating to energy efficiency which are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).
- (j) Payment to consultants.
- (1) EPA will limit its participation in the salary rate (excluding overhead) paid to individual consultants retained by grantees or by a grantee's contractors or subcontractors to the maximum daily rate for a GS-18. (Grantees may, however, pay consultants more than this amount). This limitation applies to consultation services of designated individuals with specialized skills who are paid at a daily or hourly rate. This rate does not include transportation and subsistence costs for travel performed; grantees will pay these in accordance with their normal travel reimbursement practices. (Pub. L. 99-591).
 - (2) Sub-agreements with firms for services which are awarded using the procurement requirements in this part are not affected by this limitation.
- (k) Use of the same architect or engineer during construction.
- (1) If the grantee is satisfied with the qualifications and performance of the architect or engineer who provided any or all of the facilities planning or design services for a waste-water treatment works project and wishes to retain that firm or individual during construction of the project, it may do so without further public notice and evaluation of qualifications, provided:
 - (i) The grantee received a facilities planning (Step 1) or design grant (Step 2), and selected the architect or engineer in accordance with EPA's procurement regulations in effect when EPA awarded the grant; or

(ii) The award official approves noncompetitive procurement under Sec. 31.36(d)(4) for reasons other than simply using the same individual or firm that provided facilities planning or design services for the project; or

(iii) The grantee attests that:

(A) The initial request for proposals clearly stated the possibility that the firm or individual selected could be awarded a sub-agreement for services during construction; and

(B) The firm or individual was selected for facilities planning or design services in accordance with procedures specified in this section.

(C) No employee, officer or agent of the grantee, any member of their immediate families, or their partners have financial or other interest in the firm selected for award; and

(D) None of the grantee's officers, employees or agents solicited or accepted gratuities, favors or anything of monetary value from contractors or other parties to sub-agreements.

(2) However, if the grantee uses the procedures in paragraph (k)(1) of this section to retain an architect or engineer, any Step 3 sub-agreements between the architect or engineer and the grantee must meet all of the other procurement provisions in Sec. 31.36.

[53 FR 8068 and 8087, Mar. 11, 1988, and amended at 53 FR 8075, Mar. 11, 1988; 60 FR 19639, 19644, Apr. 19, 1995; 66 FR 3794, Jan. 16, 2001]

Attachment 3B

**KRS Chapter 45A
Kentucky Model Procurement Code**

45A.075 Methods of awarding state contracts.

Except as otherwise authorized by law, all state contracts shall be awarded by:

- (1) Competitive sealed bidding, pursuant to KRS 45A.080; or
- (2) Competitive negotiation, pursuant to KRS 45A.085 and 45A.090 or 45A.180; or
- (3) Noncompetitive negotiation, pursuant to KRS 45A.095; or
- (4) Small purchase procedures, pursuant to KRS 45A.100.

Effective: June 24, 2003

History: Amended 2003 Ky. Acts ch. 98, sec. 4, effective June 24, 2003. -- Created 1978 Ky. Acts ch. 110, sec. 16, effective January 1, 1979.

45A.080 Competitive sealed bidding.

(1) Contracts exceeding the amount provided by KRS 45A.100 shall be awarded by competitive sealed bidding unless it is determined in writing that this method is not practicable. Factors to be considered in determining whether competitive sealed bidding is not practicable shall include:

- (a) Whether specifications can be prepared that permit award on the basis of best value; and
- (b) The available sources, the time and place of performance, and other relevant circumstances as are appropriate for the use of competitive sealed bidding.

(2) The invitation for bids shall state that awards shall be made on the basis of best value. In any contract which is awarded under an invitation to bid which requires delivery by a specified date and imposes a penalty for late delivery, if the delivery is late, the contractor shall be given the opportunity to present evidence that the cause of the delay was beyond his control. If it is the opinion of the purchasing officer that there is sufficient justification for delayed delivery, the purchasing officer may adjust or waive any penalty that is provided for in the contract.

(3) Adequate public notice of the invitation for bids shall be given a sufficient time prior to the date set forth for the opening of bids. The notice may include posting on the Internet or publication in a newspaper or newspapers of general circulation in the state as determined by the secretary of the Finance and Administration Cabinet not less than seven (7) days before the date set for the opening of the bids. The provisions of this subsection shall also apply to price contracts and purchase contracts of state institutions of higher education.

(4) Bids shall be opened publicly at the time and place designated in the invitation for bids. At the time the bids are opened, the purchasing agency shall announce the agency's engineer's estimate, if applicable, and make it a part of the agency records pertaining to the letting of any contract for which bids were received. Each bid, together with the name of the bidder and the agency's engineer's estimate, shall be recorded and be open to public inspection. Electronic bid opening and posting of the required information for public viewing shall satisfy the requirements of this subsection.

(5) The contract shall be awarded by written notice to the responsive and responsible bidder whose bid offers the best value.

(6) Correction or withdrawal of bids shall be allowed only to the extent permitted by regulations issued by the secretary.

Effective: July 14, 2000

History: Amended 2000 Ky. Acts ch. 509, sec. 1, effective July 14, 2000. – Amended 1998 Ky. Acts ch. 120, sec. 10, effective July 15, 1998. -- Amended 1997 (1st Extra. Sess.) Ky. Acts ch. 4, sec. 27, effective May 30, 1997. -- Amended 1996 Ky. Acts ch. 60, sec. 2, effective July 15, 1996. -- Amended 1994 Ky. Acts ch. 278, sec. 1, effective July 15, 1994. -- Amended 1982 Ky. Acts ch. 282, sec. 1, effective July 15, 1982. -- Amended 1979 (1st Extra. Sess.) Ky. Acts ch. 9, sec. 1, effective February 10, 1979. -- Created 1978 Ky. Acts ch. 110, sec. 17, effective January 1, 1979.

45A.085 Competitive negotiation.

- (1) When, under administrative regulations promulgated by the secretary or under KRS 45A.180, the purchasing officer determines in writing that the use of competitive sealed bidding is not practicable, and except as provided in KRS 45A.095 and 45A.100, a contract may be awarded by competitive negotiation.
- (2) Adequate public notice of the request for proposals shall be given in the same manner and circumstances as provided in KRS 45A.080(3).
- (3) Contracts other than contracts for projects utilizing an alternative project delivery method under KRS 45A.180 may be competitively negotiated when it is determined in writing by the purchasing officer that the bids received by competitive sealed bidding either are unreasonable as to all or part of the requirements, or were not independently reached in open competition, and for which each competitive bidder has been notified of the intention to negotiate and is given reasonable opportunity to negotiate.
- (4) Contracts for projects utilizing an alternative project delivery method shall be processed in accordance with KRS 45A.180.
- (5) The request for proposals shall indicate the relative importance of price and other evaluation factors.
- (6) Award shall be made to the responsible offerer whose proposal is determined in writing to be the most advantageous to the Commonwealth, taking into consideration price and the evaluation factors set forth in the request for proposals.
- (7) Written or oral discussions shall be conducted with all responsible offerers who submit proposals determined in writing to be reasonably susceptible of being selected for award. Discussions shall not disclose any information derived from proposals submitted by competing offerers. Discussions need not be conducted:
 - (a) With respect to prices, where the prices are fixed by law or administrative regulation, except that consideration shall be given to competitive terms and conditions;
 - (b) Where time of delivery or performance will not permit discussions; or
 - (c) Where it can be clearly demonstrated and documented from the existence of adequate competition or prior experience with the particular supply, service, or construction item, that acceptance of an initial offer without discussion would result in fair and reasonable best value procurement, and the request for proposals notifies all offerers of the possibility that award may be made on the basis of the initial offers.

Effective: June 24, 2003

History: Amended 2003 Ky. Acts ch. 98, sec. 5, effective June 24, 2003. – Amended 1997 (1st Extra. Sess.) Ky. Acts ch. 4, sec. 28, effective May 30, 1997. – Amended 1979 (1st Extra. Sess.) Ky. Acts ch. 9, sec. 2, effective February 10, 1979. -- Created 1978 Ky. Acts ch. 110, sec. 18, effective January 1, 1979.

45A.090 Negotiation after competitive sealed bidding when all bids exceed available funds.

(1) In the event that all bids submitted pursuant to competitive sealed bidding under KRS 45A.080 result in bid prices in excess of the funds available for the purchase, and the chief purchasing officer determines in writing:

(a) That there are no additional funds available from any source so as to permit an award to the responsive and responsible bidder whose bid offers the best value; and

(b) The best interest of the state will not permit the delay attendant to a resolicitation under revised specifications, or for revised quantities, under competitive sealed bidding as provided in KRS 45A.080, then a negotiated award may be made as set forth in subsections (2) or (3) of this section.

(2) Where there is more than one (1) bidder, competitive negotiations pursuant to KRS 45A.085(3) shall be conducted with the three (3) (two (2) if there are only two (2)) bidders determined in writing to be the most responsive and responsible bidders, based on criteria contained in the bid invitation. Such competitive negotiations shall be conducted under the following restrictions:

(a) If discussions pertaining to the revision of the specifications or quantities are held with any potential offerer, all other potential offerers shall be afforded an opportunity to take part in such discussions; and

(b) A request for proposals, based upon revised specifications or quantities, shall be issued as promptly as possible, shall provide for an expeditious response to the revised requirements, and shall be awarded upon the basis of best value.

(3) Where, after competitive sealed bidding, it is determined in writing that there is only one (1) responsive and responsible bidder, a noncompetitive negotiated award may be made with such bidder in accordance with KRS 45A.095.

Effective: June 24, 2003

History: Amended 2003 Ky. Acts ch. 98, sec. 6, effective June 24, 2003. – Amended 1997 (1st Extra. Sess.) Ky. Acts ch. 4, sec. 29, effective May 30, 1997. – Created 1978 Ky. Acts ch. 110, sec. 19, effective January 1, 1979.

45A.095 Noncompetitive negotiation.

(1) A contract may be made by noncompetitive negotiation only for sole source purchases, or when competition is not feasible, as determined by the purchasing officer in writing prior to award, under administrative regulations promulgated by the secretary of the Finance and Administration Cabinet or the governing boards of universities operating under KRS Chapter 164A, or when emergency conditions exist. Sole source is a situation in which there is only one (1) known capable supplier of a commodity or service, occasioned by the unique nature of the requirement, the supplier, or market conditions. Insofar as it is practical, no less than three (3)

suppliers shall be solicited to submit written or oral quotations whenever it is determined that competitive sealed bidding is not feasible. Award shall be made to the supplier offering the best value. The names of the suppliers submitting quotations and the date and amount of each quotation shall be placed in the procurement file and maintained as a public record.

Competitive bids may not be required:

(a) For contractual services where no competition exists, such as telephone service, electrical energy, and other public utility services;

(b) Where rates are fixed by law or ordinance;

(c) For library books;

- (d) For commercial items that are purchased for resale;
 - (e) For interests in real property;
 - (f) For visiting speakers, professors, expert witnesses, and performing artists;
 - (g) For personal service contracts executed pursuant to KRS 45A.690 to 45A.725; and
 - (h) For agricultural products in accordance with KRS 45A.645.
- (2) The chief procurement officer, the head of a using agency, or a person authorized in writing as the designee of either officer may make or authorize others to make emergency procurements when an emergency condition exists.
- (3) An emergency condition is a situation which creates a threat or impending threat to public health, welfare, or safety such as may arise by reason of fires, floods, tornadoes, other natural or man-caused disasters, epidemics, riots, enemy attack, sabotage, explosion, power failure, energy shortages, transportation emergencies, equipment failures, state or federal legislative mandates, or similar events. The existence of the emergency condition creates an immediate and serious need for services, construction, or items of tangible personal property that cannot be met through normal procurement methods and the lack of which would seriously threaten the functioning of government, the preservation or protection of property, or the health or safety of any person.
- (4) The Finance and Administration Cabinet may negotiate directly for the purchase of contractual services, supplies, materials, or equipment in bona fide emergencies regardless of estimated costs. The existence of the emergency shall be fully explained, in writing, by the head of the agency for which the purchase is to be made. The explanation shall be approved by the secretary of the Finance and Administration Cabinet and shall include the name of the vendor receiving the contract along with any other price quotations and a written determination for selection of the vendor receiving the contract. This information shall be filed with the record of all such purchases and made available to the public. Where practical, standard specifications shall be followed in making emergency purchases. In any event, every effort should be made to effect a competitively established price for purchases made by the state.

Effective: July 15, 2002

History: Amended 2002 Ky. Acts ch. 344, sec. 9, effective July 15, 2002. – Amended 1997 (1st Extra. Sess.) Ky. Acts ch. 4, sec. 30, effective May 30, 1997. – Amended 1990 Ky. Acts ch. 496, sec. 4, effective July 13, 1990. -- Created 1978 Ky. Acts ch. 110, sec. 20, effective January 1, 1979.

45A.100 Small purchases.

- (1) Procurements may be made in accordance with small purchase administrative regulations promulgated by the secretary of the Finance and Administration Cabinet, pursuant to KRS Chapter 13A, as follows:
- (a) Up to ten thousand dollars (\$10,000) per project for construction and one thousand dollars (\$1,000) for purchases by any state governmental body, except for those state administrative bodies specified in paragraph (b) of this subsection; and
 - (b) Up to forty thousand dollars (\$40,000) per project for construction or purchases by the Finance and Administration Cabinet, state institutions of higher education, and the legislative branch of government.
- (2) Procurement requirements shall not be artificially divided so as to constitute a small purchase under this section. At least every two (2) years, the secretary shall review the prevailing costs of labor and materials and may make recommendations to the next regular

session of the General Assembly for the revision of the then current maximum small purchase amount as justified by intervening changes in the cost of labor and materials.

(3) The secretary of the Finance and Administration Cabinet may grant to any state agency with a justifiable need a delegation of small purchasing authority, which exceeds the agency's small purchase limit, provided in subsection (1) of this section.

Delegations of small purchasing authority shall be granted or revoked by the secretary of the Finance and Administration Cabinet, in accordance with administrative regulations promulgated by the cabinet pursuant to KRS Chapter 13A. These administrative regulations shall establish, at a minimum, the criteria for granting and revoking delegations of small purchasing authority, including the requesting agency's past compliance with purchasing regulations, the level of training of the agency's purchasing staff, and the extent to which the agency utilizes the Kentucky Automated Purchasing System. The administrative regulations may permit the secretary of the Finance and Administration Cabinet to delegate small purchase procurements up to the maximum amount specified in subsection (1)(b) of this section.

Effective: July 15, 2002 **History:** Amended 2002 Ky. Acts ch. 320, sec. 2, effective July 15, 2002. -- Amended 2000 Ky. Acts ch. 225, sec. 1, effective July 14, 2000. -- Amended 1996 Ky. Acts ch. 60, sec. 1, effective July 15, 1996. -- Amended 1994 Ky. Acts ch. 323, sec. 1, effective July 15, 1994. -- Amended 1990 Ky. Acts ch. 496, sec. 5, effective July 13, 1990. -- Amended 1986 Ky. Acts ch. 384, sec. 1, effective July 15, 1986. -- Amended 1984 Ky. Acts ch. 384, sec. 1, effective July 13, 1984. -- Amended 1982 Ky. Acts ch. 282, sec. 2, effective July 15, 1982. -- Amended 1980 Ky. Acts ch. 242, sec. 1, effective July 15, 1980; and ch. 250, sec. 19, effective April 9, 1980.-- Created 1978 Ky. Acts ch. 110, sec. 21, effective January 1, 1979.

Attachment Number 4

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE
EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

The following excerpts are from 45 FR 65984 (October 3, 1980):

The minority and female goals apply to Federal and federally assisted construction contractors and subcontractors which have covered contracts. The goals are expressed as a percentage of the total hours worked by such a covered or subcontractor's entire onsite construction workforce, which is working on any construction site within a relevant area. The goal applies to each construction craft and trade in the contractor's entire workforce in the relevant area including those employees working on private non-federally involved projects.

Until further notice, the following goals for minority utilization in each construction craft and trade shall be included in all Federal or federally assisted construction contracts and subcontracts in excess of \$10,000 to be performed in the respective geographic area. The goals are applicable to each nonexempt contractor's total onsite construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, federally assisted or non-federally related project, contract or subcontract.

Construction contractors which are participating in an approved Hometown Plan (see 41 CFR 60-4.5) are required to comply with the goals of the Hometown Plan with regard to construction work they perform in the area covered by the Hometown Plan. With regard to all their other covered construction work, such contractors are required to comply as follows:

Goals for female participation in each trade.....6.9%
Goals for minority participation in each trade.....Insert goals for each year
(see Attachment Number 6)

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or Federally assisted) performed in the covered area.

The following excerpts are from 45 FR 65977 (October 3, 1980):

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation 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 the 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 the 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.

3. The 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 the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the covered area is (insert description of the geographical areas where the contract is to be performed giving the state, country, and city, if any).

Attachment Number 5

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION
CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)**

EEO Specifications

Following is the standard language, which must be incorporated into all solicitations for offers and bids on all Federal and Federally assisted construction contracts or subcontracts in excess of \$10,000 to be performed in designated geographical areas:

1. As used in these specifications:

- (a) Covered Area means the geographical area described in the solicitation from which this contract resulted.
- (b) Director means Director, Office of Federal Contract Compliance Program, United States Department of Labor, or any person to whom the Director delegates authority;
- (c) Employer identification number means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
- (d) Minority includes:
 - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take a good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7-a through p of these specifications. The goals set forth in the solicitation from which this contract resulted

are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative action to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative actions steps at least as extensively as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligation.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources complied under 7-b above.

- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, lay-off, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
- k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- l. Conduct, at least annually, an inventory and evaluation of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that EEO policy and the Contractor's obligations under these specifications are being carried out.
- n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations, which assist in fulfilling one or more of their affirmative actions obligations (7 a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant may be asserted as fulfilling any one or more of its obligations under 7 a through p of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example: even though the Contractor has achieved its goal for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables for affirmative action standards to discriminate against any person because of race, color, religion, sex or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation, if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the

hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

Attachment Number 6

EEO Goals for Economic Areas in Region 4

Source: Appendix B-80 in 45 FR 65984 (October 3, 1980)

Kentucky:

056 Paducah, KY:	
Non-SMSA Counties	5.2
IL Hardin; IL Massac; IL Pope; KY Ballard; KY Caldwell; KY Calloway. KY Carlisle; KY Crittenden; KY Fulton; KY Graves; KY Hickman; KY Livingston; KY Lyon. KY McCracken; KY Marshall.	
057 Louisville, KY:	
SMSA Counties:	
4520 Louisville, KY-IN	11.2
IN Clark; IN Floyd; KY Bullitt; KY Jefferson; KY Oldham.	
Non-SMSA Counties	9.6
IN Crawford; IN Harrison; IN Jefferson; IN Orange; IN Scott; IN Washington; KY Breckinridge; KY Grayson; KY Hardin; KY Hart; KY Henry; KY Larue; KY Marion; KY Meade; KY Nelson; KY Shelby; KY Spencer; KY Trimble; KY Washington.	
058 Lexington, KY	
SMSA Counties	
4280 Lexington-Fayette, KY	10.8
KY Bourbon; KY Clark; KY Fayette; KY Jessamine; KY Scott; KY Woodford.	
Non-SMSA Counties	7.0
KY Adair KY Anderson; KY Bath; KY Boyle; KY Breathitt; KY Casey; KY Clay; KY Estill; KY Franklin- KY Garrard; KY Green; KY Harrison- KY Jackson; KY Knott; KY Lee; KY Leslie; KY Letcher; KY Lincoln; KY Madison; KY Magoffin; KY Menifee; KY Mercer; KY Montgomery; KY Morgan. KY Nicholas; KY Owsley; KY Perry; KY Powell; KY Pulaski; KY Rockcastle; KY Russell; KY Taylor; KY Wolfe.	

Attachment Number 7

**CHECK LIST OF EEO DOCUMENTATION FOR BIDDERS
ON GRANT/LOAN CONSTRUCTION
(Required by Executive Order 11246 as amended)**

The low, responsive responsible bidder must forward the following items, in duplicate, to the owner no later than ten (10) days after bid opening. The owner shall have one (1) copy available for inspection by the Office of Federal Contracts Compliance within 14 days after the bid opening. The web site for the OFCC is http://www.dol.gov/esa/ofcp_org.htm.

1. Project Number. Project Location. Type of Construction.
2. Proof of registration with the Joint Reporting Commission. (See Attachment Number 8.)
3. Copy of Affirmative Action Plan of contractor. Indicate company official responsible for EEO.
4. List of current construction contracts, with dollar amount. List contracting Federal Agency, if applicable.
5. Statistics concerning company percent workforce, permanent and temporary, by sex, race, trade, handicapped, and age. 40 CFR Part 7.
6. List of employment sources for project in question. If union sources are utilized, indicate percentage of minority membership within the union crafts.
7. Anticipated employment needs for this project, by sex, race and trade, with estimate of minority participation in specific trades.
8. List of subcontractors (name, address and telephone) with dollar amount and duration of subcontract. Subcontractor contracts over \$10,000 must submit items 1- 8. The following information must be provided for all supplier contracts regardless of contract size: name of company, contact person, address, telephone number, dollar value of the contract, and a list of the materials to be supplied to the prime contractor.
9. List of any subcontract work yet to be committed with estimate of dollar amount and duration of contract.
10. Contract Price. Duration of prime contract.
11. DBE Documents - See special instructions regarding use of Minority, and Women Owned, and Small Businesses.

Attachment Number 8

Employer Information Report EEO-1

Under the direction of the US Equal Employment Opportunity Commission, the Joint Reporting Committee is responsible for the full-length, multi-phase processing of employment statistics collected on the Employer Information Report EEO-1. This report, also termed Standard Form 100, details the sex and race/ ethnic composition of an employer's work force by job category.

The Employer Information EEO-1 survey is conducted annually under the authority of Public Law 88-352, Title VII of the Civil Rights Act of 1964, as amended by the Equal Employment Opportunity Act of 1972. All employers with 15 or more employees are covered by Public Law 88-352 and are required to keep employment records as specified by Commission regulations. Based on the number of employees and federal contract activities, certain large employers are required to file an EEO-1 Report on an annual basis.

The EEO-1 Report must be filed by:

(A) All private employers who are: (1) subject to Title VII of the Civil Rights Act of 1964 (as amended by the Equal Employment Opportunity Act of 1972) with 100 or more employees EXCLUDING State and local governments, primary and secondary school systems, institutions of higher education, Indian tribes and tax-exempt private memberships clubs other than labor organizations; OR (2) subject to Title VII who have fewer than 100 employees if the company is owned or affiliated with another company, or there is centralized ownership, control or management (such as central control of personnel policies and labor relations) so that the group legally constitutes a single enterprise and the entire enterprise employs a total of 100 or more employees.

(B) All federal contractors (private employers), who: (1) are not exempt as provided for by 41 CFR 60-1.5, (2) have 50 or more employees, and (a) are prime contractors or first-tier subcontractors, and have a contract, subcontract, or purchase order amounting to \$50,000 or more; or (b) serve as depository of Government funds in any amount, or (c) is a financial institution which is issuing an paying agent for U.S. Savings Bonds and Notes.

Only those establishments located in the District of Columbia and the 50 states are required to submit the EEO-1 Report. No Reports should be filed for establishments in Puerto Rico, the Virgin Islands or other American Protectorates.

When filing for the EEO-1 Report for the first time, go to the web site at: <http://www.mimdms.com/jrc.html> and select "Filing for the first time" from the box labeled INFORMATION. File out the electronic questionnaire to enter your company into Joint Reporting Committee (JRC) system. Once you have completed the registration process, you will be contacted on how to proceed with the EEO-1 Report. If you have previously registered with the JRC, follow their instructions to update your information.

Labor Standards Provisions For Federally Assisted Construction

Labor standards provisions applicable to contracts covering federally financed and assisted construction (29 CFR 5.5, Contract Provisions and Related Matters) that apply to EPA Special Appropriations Projects grants are:

(a)(4)(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

(a)(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

(a)(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5 (a) (1) through (10) and such other clauses as the U.S. Environmental Protection Agency may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(a)(7) Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(b) Contractor Work Hours and Safety Standards Act. The Administrator, EPA shall cause or require the contracting officer to insert the following clauses set forth in paragraph (b)(1),(2),(3), and (4) of this section in full in any contract subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by *Section 5.5(a) of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any work week in which he or she is employed on such work to in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b) (1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for unliquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The U.S. Environmental Protection Agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally- assisted contract subject to the Contract Work Hours and Safety

Standards Act, which is held by the same prime contractor, such liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b) (2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(c) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in section 5.1, the Administrator of EPA shall cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly worked, deductions made, and actual wages paid. Further, the Administrator of EPA shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the U.S. Environmental Protection Agency and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job. (Approved by the Office of Management and Budget under OMB control numbers 1215-0140 and 1215-0017.)

CERTIFICATIONS

Debarred Firms

All prime Construction Contractors shall certify that Subcontractors have not and will not be awarded to any firm that is currently on the EPA Master List of Debarred, Suspended and Voluntarily Excluded Persons in accordance with the provisions of 40 CFR 32.500(c). Debarment action is taken against a firm for noncompliance with Federal Law.

All bidders shall complete the attached certification (Attachment Number 10) and submit to the owner with the bid proposal.

Anti-lobbying Certification

All prime Construction Contractors must certify (Attachment Number 11) that no appropriated funds were or will be expended for the purpose of lobbying the Executive or Legislative Branches of the Federal Government or Federal Agency concerning this contract (contract in excess of \$100,000). If the Contractor has made or agreed to make payment to influence any member of Congress in regard to award of this contract, a Disclosure Form must be completed and submitted to the owner with the bid proposal.

All prime Contractors must require all Subcontractors to submit the certification, which must also be submitted to the owner.

EPA Form 5700-49

Attachment Number 10

**CERTIFICATION REGARDING DEBARMENT,
SUSPENSION AND OTHER RESPONSIBILITY MATTERS**

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

- (A) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or Local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
 - (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.
- I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

Typed Name & Title of Authorized Representative

Signature of Authorized Representative

Date

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

Attachment Number 11

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

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

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

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

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

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

TYPED NAME & TITLE OF AUTHORIZED REPRESENTATIVE

SIGNATURE OF AUTHORIZED REPRESENTATIVE DATE

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

Attachment Number 12

EPA DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

EPA's Disadvantaged Business Enterprise Program rule applies to contract procurement actions funded in part by EPA assistance agreements awarded after May 27, 2008. The rule is found at Federal regulation Title 40, Part 33. Specific responsibilities are highlighted below.

Grant recipient responsibilities:

- Conduct an Availability Analysis and negotiate fair share objectives with EPA (§ 33.411), or adopt the fair share objectives of the oversight state agency revolving loan fund for comparable infrastructure. (§ 33.405(b)(3)).
- Include the Appendix A term and condition in each contract with a primary contractor (§ 3.106). The term and condition is included in the EPA Region 4 contract specifications insert *FEDERAL REQUIREMENTS AND CONTRACT PROVISIONS FOR SPECIAL APPROPRIATION ACT PROJECTS US ENVIRONMENTAL PROTECTION AGENCY, Region III, June 2008*.
- Employ the six Good Faith Efforts during prime contractor procurement (§ 33.301).
- Require prime contractor to comply with the following prime contractor requirements of Title 40 Part 33:
 - To employ the six Good Faith Efforts steps in paragraphs (a) through (e) of § 33.301 if the prime contractor awards subcontracts (§ 33.301(f)).
 - To provide EPA form 6100-2 – *DBE Subcontractor Participation Form* to all DBE subcontractors (§ 33.302(e)).
 - To submit EPA forms 6100-3 – *DBE Program Subcontractor Performance Form* and 6100-4 – *DBE Program Subcontractor Utilization Form* with bid package or proposal. (§ 33.302 (f) and (g)).
 - To pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the recipient (§ 33.302(a)).
 - To notify recipient in writing by its prime contractor prior to any termination of a DBE subcontractor for convenience by the prime contractor (§ 33.302(b)).
 - To employ the six good faith efforts described in § 33.301 if soliciting a replacement subcontractor after a DBE subcontractor fails to complete work under the subcontract for any reason. (§ 33.302(c)).

- To employ the six good faith efforts described in § 33.301 even if the prime contractor has achieved its fair share objectives under subpart D of Part 33. (§33.302(d)).
- Semiannually complete and submit to Charles Hayes, EPA Region 4 DBE Coordinator EPA form 5700-52A summarizing DBE participation achieved during the previous six months (§ 33.502).
- Maintain records documenting its compliance with the requirements of Title 40 Part 33, including documentation of its, and its prime contractors', good faith efforts (§ 33.501(a)).

Prime Contractor Responsibilities:

- Employ the six Good Faith Efforts steps in paragraphs (a) through (e) of § 33.301 if the prime contractor awards subcontracts (§ 33.301(f)).
- Provide EPA form number 6100-2 – *DBE Program Subcontractor Participation Form* and form number 6100-3 – *DBE Program Subcontractor Performance Form* to each DBE subcontractor prior to opening of the contractor's bid or proposal (§ 33.302(e) and (f)).
- Complete EPA form number 6100-4 – *DBE Program Subcontractor Utilization Form* (§ 33.302(g)).
- Submit to recipient with its bid package or proposal the completed EPA form number 6100-4, plus an EPA form number 6100-3 for each DBE subcontractor used in the contractor's bid or proposal (§ 33.302(f) and (g)).
- Pay subcontractors for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the recipient (§ 33.302(a)).
- Notify the recipient in writing prior to prime contractor termination of a DBE subcontractor for convenience (§ 33.302(b)).
- Employ the six good faith efforts described in § 33.301 if soliciting a replacement subcontractor after a DBE subcontractor fails to complete work under the subcontract for any reason. (§ 33.302(c)).
- Employ the six good faith efforts described in § 33.301 even if the prime contractor has achieved its fair share objectives under subpart D of Part 33. (§33.302(d)).
- Semiannually inform recipient of DBE participation achieved (§ 33.502).
- Maintain records documenting its compliance with the requirements of Title 40 Part 33, including documentation of its, and its prime contractors', good faith efforts (§ 33.501(a)).

Subcontractor Responsibilities:

- May submit EPA form 6100-2 – *DBE Subcontractor Participation Form* to Charles Hayes, EPA Region 4 DBE Coordinator (§ 33.302(e)).
- Must complete EPA form 6100-3 – *DBE Program Subcontractor Performance Form*, and submit it to the prime contractor soliciting services from the subcontractor prior to the opening of bids for the prime contract.

SPAP Requirements:

Form	Requirement	Provided By:	Completed By:	Submitted To:
EPA Form 6100-2	Grant Recipients required to have prime contractors provide form to Subcontractors	Prime Contractors	DBE Subcontractors	EPA Region 4 DBE Coordinator Charles Hayes
EPA Form 6100-3	Grant Recipients required to have prime contractors provide form to Subcontractors	Prime Contractors	DBE Subcontractors	Grant Recipients as part of a bid or proposal package
EPA Form 6100-4	Grant Recipients required to have prime contractors complete the form	Grant Recipients	Prime Contractors	Grant Recipients as part of a bid or proposal package

SRF Requirements:

Form	Requirement	Provided By:	Completed By:	Submitted To:
EPA Form 6100-2	Recipients required to have prime contractors provide form to Subcontractors	Prime Contractors	DBE Subcontractors	DOW Project Administrator
EPA Form 6100-3	Recipients required to have prime contractors provide form to Subcontractors	Prime Contractors	DBE Subcontractors	Dow Project Administrator w/ ATA Package
EPA Form 6100-4	Recipients required to have prime contractors complete the form	Recipients	Prime Contractors	DOW Project Administrator w/ ATA Package
Pay Request DBE Form	Recipients required to have prime contractors complete the form	Recipients	Prime Contractors	DOW Project Administrator w/ EACH PAYMENT

DISADVANTAGED ENTERPRISE PARTICIPATION POLICY

PROJECT NAME: _____ **BID DATE:** _____

1. Name, address and telephone number of contact person on all DBE matters:

Prime Contractor's Name: _____

Contact Person: _____

Address: _____

Phone: _____

Cell Phone: _____

Email: _____

Total Contract Amount:

5. Total dollar amount/percent of contract of MBE participation:

6. Total dollar amount/percent of contract of WBE participation:

7. Certifications* for each subcontractor enclosed: Yes No

8. Subcontracts or letters of intent signed by both parties enclosed: Yes No

9. **List of MBE Subcontractors:**

Name: _____

Contact Person: _____

Address: _____

Phone: _____

Cell Phone: _____

Email: _____

Type of Contract: _____

Work to be Done: _____

Amount: _____

10. **List of WBE Subcontractors:**

Name: _____

Contact Person: _____

Address: _____

Phone: _____

Cell Phone: _____

Email: _____

Type of Contract: _____

Work to be Done: _____

Amount: _____

Attach Additional Sheets, If Necessary

*Self-certification: Self certification of MBE/WBE/DBE firms will NOT be accepted as a valid form of certification of MBE/WBE/DBE status.

Information concerning the efforts for obtaining subcontractor(s)

11. Information to be submitted by the bidder concerning good faith efforts taken

- a. Advertisements, etc.: List each publication in which an announcement or notification was placed and attach the tear sheet of each announcement from each publication

Name of publication: _____

Address: _____

Dates of advertisement: _____

Specific subcontract areas announced: _____

- b. List each DBE construction firm or supplier to which a letter of solicitation was sent or with whom negotiations were held.

Company name and phone number: _____

Area of Work Expertise: _____

Date of any follow-up call and person spoke to: _____

- c. Copies of returned envelopes.
- d. Copies of faxes sent.
- e. Copies of certified mail return receipts.
- f. Copies of letters or e-mails from solicited firms declining offer.
- g. Copy of bidders list (see sheet below):

Attachment Number 13

REGION 4
DISADVANTAGED BUSINESS ENTERPRISE (DBE) NEGOTIATED RATES
(Subject to change - refer to grant award for specific fair share objectives)

KENTUCKY	
SRF Construction: (both programs)	0.70% MBE and 7.60% WBE
Equipment:	1.20% MBE and 1.10% WBE
Services:	1.20% MBE and 16.30% WBE
Supplies:*	3.70% MBE and 4.60% WBE

Attachment Number 14

BONDS AND INSURANCE

The minimum requirements shall be as follows:

Bonding requirements for contracts of \$100,000 or less are contained in 40 CFR 31.36(h).

Bond requirements for contracts in excess of \$100,000 are:

- < Bid guarantee equivalent to five percent of the bid price. The bid guarantee shall consist of a firm commitment such as a certified check or bid bond submitted with the bid;
- < Performance bond equal to 100 percent of the contract price, and
- < Payment bond equal to 100 percent of the contract price. Bonds must be obtained from companies holding Certificates of Authority as acceptable sureties, issued by the U.S. Treasury.

Insurance requirements are contained in the General Conditions of the contract. In addition to the other required insurance, the owner or the contractor, as appropriate, must acquire any flood insurance made available by the Federal Emergency Management Agency as required by 44 CFR Parts 59-79, if construction will take place in a flood hazard area identified by the Federal Emergency Management Agency. The owners requirements on Flood Insurance are contained in the Special Conditions Section of the Contracts Documents.

Attachment No. 15

OUTLAY MANAGEMENT

The contractor must provide a contract progress schedule of percentage of work in place and costs against time; and a schedule of projected payments (cumulative) for construction and for the architectural/engineering contract when the contract is awarded. The payment schedule must be submitted, in a format similar to the attached sample, to the owner for forwarding to the State when the contract is awarded, and whenever actual payments on a project vary beyond -5 percent and +10 percent from the schedule, as determined by the grantee.

Contractor will be required to review each of these contract schedules during the month of June and to submit revised schedules, as necessary, no later than July 1st of each year.

THIS FORMAT IS A SAMPLE ONLY.

CONSTRUCTION AND OUTLAY SCHEDULE

Project No.: _____

Applicant: _____

Contract Identification: _____

Description of Contract: _____

(INSTRUCTIONS FOR USE ON REVERSE SIDE)

SCHEDULE I - CONSTRUCTION SCHEDULE

Date for Advertisement: _____

Date for Opening Bids: _____

Pre-Construction Conference Date: _____

Date of Contract Award: _____

Contract Period: _____ days Projected Contract Completion Date: _____

Total Eligible Contract Amount: _____

Work Order Date: _____

Start Construction Date: _____

Contract Completed: _____

SCHEDULE II - CUMULATIVE OUTLAY SCHEDULE (55% EPA Share) - Projection
only for quarters that remain in the fiscal year (FY) plus cumulative
annual amount for the next FY.

Cum EPA Amount thru 1 st Qtr. Oct./Dec.:	\$ _____
Cum EPA Amount thru 2 nd Qtr. Jan./Mar.:	\$ _____
Cum EPA Amount thru 3 rd Qtr. Apr./June:	\$ _____
Cum EPA Amount thru 4 th Qtr. July/Sept.:	\$ _____
Cum EPA Amount for Next Fiscal Year:	\$ _____

INSTRUCTIONS (Construction and Outlay Schedules)

To insure timely achievement of the grant objectives the owner (grantee) must provide EPA with a grants activities schedule, contract construction schedules and corresponding payment outlay schedules for the grant and each contract under the grant. One copy of information similar to that showing the Construction and Outlay Schedule Form will be submitted for the grant schedule with the grant acceptance. A separate form will accompany each contract at time of contract award.

- A. The grant activities schedule shall depict the period from grant award through grant closeout and cover all major milestone date. The grant activities schedule shall include Schedule I information items as well as other appropriate items necessary to monitor the grant. Schedule II shall be filled out to estimate the cumulative (all construction and architectural/engineering contracts) payment schedule to be requested by the grantee from EPA during the grant period, and whenever actual outlays vary beyond -5% and +10% from the schedule.
- B. Individual contractor's construction schedules for each contract will be submitted to support the grant activities schedule. The Schedule I shall be submitted prior to date of advertisement of each contract and Schedule II along with the contractor's construction schedule shall be submitted seven (7) calendar days prior to the dates of the pre-construction conference. The contractor's construction schedule shall depict the contractor's plan for completing all contract requirements and show work placement in dollars versus contract time. Schedule II shall depict the contract payment outlay by month or quarter. The contract schedule will be coordinated with all parties at the pre-construction conference.

The grants activities schedule, contractor construction schedules, will be the basis for monitoring progress towards completion of the project. The schedules shall be maintained at the available for inspection and updated at least monthly. The schedules shall be revised to incorporate approved change orders as they occur.

All of the schedules will be submitted to the State Division of Water.

Attachment No. 16

NOTICE OF INTENT

All construction projects with surface disturbance of more than 1 acre during the period of construction must have a KPDES Storm Water General Permit. The permit can be found at the following web address: **<https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7>**.

If you have any questions regarding the completion of this form call the Surface Water Permits Branch, at (502) 564-3410.

KPDES FORM NOI-SW

Kentucky Pollutant Discharge Elimination System (KPDES)

Instructions

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity
To Be Covered Under The KPDES General Permit

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, Industrial Section, Kentucky Division of Water at (502) 564-3410.

If you have any questions regarding the completion of this form call the Storm Water Contact, Industrial Section, at (502) 564-3410.

SECTION I - 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 as the name of the facility. The responsible party is the legal entity that 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.

Enter the appropriate letter to indicate the legal status of the operator of the facility.

F = Federal M = Public (other than federal or state)
S = State P = Private

SECTION II - FACILITY/SITE LOCATION INFORMATION

Enter the facility's or site's official or legal name and complete street address, including city, state, and ZIP code.

SECTION III - SITE ACTIVITY INFORMATION

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g., municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges.

If data is available submit with this form.

List, in descending order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section II of this application.

If the facility listed in Section II has participated in Part 1 of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other KPDES permits presently issued for the facility or site listed in Section II, list the permit numbers.

SECTION IV - ADDITIONAL INFORMATION REQUIRED FOR CONSTRUCTION ACTIVITIES ONLY

Construction activities must complete Section IV in addition of Sections I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, permits, or storm water management plans.

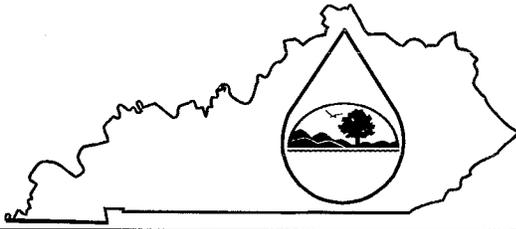
SECTION V - CERTIFICATION

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 officer or ranking elected official.



Kentucky Pollutant Discharge Elimination System
(KPDES)
Notice of Intent (NOI)
for Storm Water Discharges
Associated with Industrial Activity Under the
KPDES General Permit

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a KPDES permit issued for storm water discharges associated with industrial activity. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM (See Instructions on back)

I. Facility Operator Information

Name:		Phone:	
Address:		Status of Owner/Operator:	
City, State, Zip Code:			

II. Facility/Site Location Information

Name:			
Address:			
City, State, Zip Code:			
County:			
Site Latitude: (degrees/minutes/seconds)		Site Longitude: (degrees/minutes/seconds)	

III. Site Activity Information

MS4 Operator Name:				
Receiving Water Body:				
Are there existing quantitative data?	Yes <input type="checkbox"/>	If Yes, submit with this form.		
	No <input type="checkbox"/>			
SIC or Designated Activity Code Primary		2nd	3rd	4th
If this facility is a member of a Group Application, enter Group Application Number:				
If you have other existing KPDES Permits, enter Permit Numbers:				

IV. Additional Information Required FOR CONSTRUCTION ACTIVITIES ONLY

Project Start Date:		Completion Date:	
Estimated Area to be disturbed (in acres):			
Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	

V. Certification: 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, 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.

Printed or Typed Name:			
Signature:		Date:	

WAGE RATES

Federal Davis-Bacon rates are applicable for these funds. This determination applies only to the grant/loan portion of this project. Please contact the other funding sources, if applicable, for their requirements pertaining to federal wage rates. You must contact the Kentucky Labor Cabinet for determination of applicable state wages.

23.

KENTUCKY PREVAILING WAGE DETERMINATION



Steven L. Beshear
Governor

Daniel Mongiardo
Lieutenant 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) 564-2248
www.labor.ky.gov

Mark S. Brown
Secretary

Michael L. Dixon
Commissioner

November 4, 2011

Bryan Kirby
CEDA
PO Box 855
Richmond KY 40476

Re: Breathitt County Fiscal Court, Southfork Waterline Extension Project

Advertising Date as Shown on Notification: November 10, 2011

Dear Bryan Kirby:

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 5-030, dated August 2, 2010 for BREATHITT 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: 013-H-00063-10-5, Heavy/Highway

Sincerely,

Michael L. Dixon
Commissioner



KENTUCKY LABOR CABINET
PREVAILING WAGE DETERMINATION
CURRENT REVISION
LOCALITY NO. 030

Determination No. CR-5-030

Project No.	013-H-00063-10-5
Type:	_____ Bldg _____ x _____ HH

Date of Determination: August 2, 2010

This schedule of the prevailing rate of wages for Locality No. 030, which includes Breathitt, Floyd, Knott and Letcher 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-5-030.

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

Overtime is to be computed at not less than one and one-half (1 1/2) times the indicated BASE RATE for all hours worked in excess of eight (8) per day, and/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 calendar day, but not more than ten (10) hours worked in any one calendar day, if such written agreement is prior to the over eight (8) hours in a calendar day 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

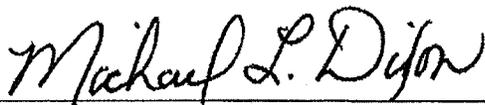
Building construction is the construction of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment, or supplies. It includes all construction of such structures, the installation of utilities and the installation of equipment, both above and below grade level,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



Michael L. Dixon, Commissioner
Department of Workplace Standards
Kentucky Labor Cabinet

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

BREATHITT, FLOYD, KNOTT & LETCHER

ASBESTOS/INSULATION WORKERS:

Mechanics:		BASE RATE	\$26.22
		FRINGE BENEFITS	12.90

Insulation removers & hazardous waste handlers:		BASE RATE	\$11.13
		FRINGE BENEFITS	3.40

BREATHITT, FLOYD, KNOTT & LETCHER

BOILERMAKERS:		BASE RATE	\$24.65
		FRINGE BENEFITS	12.59

BREATHITT, FLOYD, KNOTT & LETCHER

BRICKLAYERS:		BASE RATE	\$12.00
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BREATHITT, FLOYD, KNOTT & LETCHER COUNTIES:

CARPENTERS:

Carpenters:	BUILDING	BASE RATE	\$27.02
		FRINGE BENEFITS	14.14

Piledriver:	BUILDING	BASE RATE	\$27.42
		FRINGE BENEFITS	14.14

CARPENTERS/ HEAVY HIGHWAY:

BREATHITT, FLOYD, KNOTT & LETCHER COUNTIES:

Carpenters:	HEAVY & HIGHWAY	BASE RATE	\$23.60
		FRINGE BENEFITS	9.05

Piledriver:	HEAVY & HIGHWAY	BASE RATE	\$23.85
		FRINGE BENEFITS	9.05

Divers:	HEAVY & HIGHWAY	BASE RATE	\$35.77
		FRINGE BENEFITS	9.05

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

BREATHITT, FLOYD & KNOTT COUNTIES:

CEMENT MASONS:	BASE RATE	\$12.00
	FRINGE BENEFITS	1.28

LETCHER COUNTY:

CEMENT MASONS & PLASTERERS:	BASE RATE	\$ 14.00
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BREATHITT, FLOYD, KNOTT & LETCHER

ELECTRICIANS:	BASE RATE	\$31.87
	FRINGE BENEFITS	19.96

BREATHITT, FLOYD, KNOTT & LETCHER

ELEVATOR CONSTRUCTORS:	BASE RATE	\$32.00
	FRINGE BENEFITS	10.33

BREATHITT, FLOYD, KNOTT & LETCHER

GLAZIERS:	BASE RATE	\$8.43
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BREATHITT, FLOYD, KNOTT & LETCHER

IRONWORKERS:	BASE RATE	\$27.12
	FRINGE BENEFITS	17.19

BREATHITT, FLOYD, KNOTT & LETCHER

LABORERS:

LABORERS:	BUILDING	BASE RATE	\$8.00
		FRINGE BENEFITS	1.28

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

BREATHITT, FLOYD, KNOTT & LETCHER

LABORERS/HEAVY HIGHWAY

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:

HEAVY & HIGHWAY	BASE RATE	\$17.43
	FRINGE BENEFITS	8.23

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	\$17.68
	FRINGE BENEFITS	8.23

HEAVY HIGHWAY GROUP 3:

Asphalt luteman 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	\$17.73
	FRINGE BENEFITS	8.23

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 driller (all types), powderman and blaster,:

HEAVY & HIGHWAY	BASE RATE	\$18.33
	FRINGE BENEFITS	8.23

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

BREATHITT, FLOYD, KNOTT & LETCHER

MARBLE, TILE & TERRAZZO:

Workers:	BASE RATE	\$19.88
	FRINGE BENEFITS	6.30
Finishers:	BASE RATE	\$13.68
	FRINGE BENEFITS	2.41

BREATHITT, FLOYD, KNOTT & LETCHER

MILLWRIGHTS:	BASE RATE	\$18.73
	FRINGE BENEFITS	10.22

BREATHITT, FLOYD, KNOTT & LETCHER

OPERATING ENGINEERS

OPERATING ENGINEERS:	BUILDING	BASE RATE	\$14.00
		FRINGE BENEFITS	1.28

OPERATING ENGINEERS/ HEAVY HIGHWAY:

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	\$23.60
	FRINGE BENEFITS	12.40

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

BREATHITT, FLOYD, KNOTT & LETCHER

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.), 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	\$21.18
	FRINGE BENEFITS	12.40

HEAVY HIGHWAY CLASS B2:

Greaser on Grease Facilities servicing Heavy Equipment:

HEAVY & HIGHWAY	BASE RATE	\$21.56
	FRINGE BENEFITS	12.40

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	\$20.92
	FRINGE BENEFITS	12.40

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.

BREATHITT, FLOYD & KNOTT COUNTIES:

PAINTERS:

Painters:	BUILDING	BASE RATE	\$13.42
		FRINGE BENEFITS	1.28
	HEAVY & HIGHWAY	BASE RATE	\$17.30
		FRINGE BENEFITS	3.80

CR-5-030
August 2, 2010

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

LETCHER COUNTY:

PAINTERS:

Painters:	BUILDING	BASE RATE	\$12.00
	HEAVY & HIGHWAY	BASE RATE	\$17.30
		FRINGE BENEFITS	3.80

BREATHITT, FLOYD, KNOTT & LETCHER

PLUMBERS & STEAMFITTERS:		BASE RATE	\$25.70
		FRINGE BENEFITS	17.91

BREATHITT, FLOYD, KNOTT & LETCHER

ROOFERS: (Excluding Metal Roofs)		BASE RATE	\$9.30
		FRINGE BENEFITS	1.28

BREATHITT, FLOYD, KNOTT & LETCHER

SHEETMETAL WORKERS: (Including Metal Roofs)		BASE RATE	\$10.97
		FRINGE BENEFITS	1.28

BREATHITT, FLOYD, KNOTT & LETCHER

SPRINKLER FITTERS:		BASE RATE	\$27.80
		FRINGE BENEFITS	13.80

BREATHITT, FLOYD, KNOTT & LETCHER

TRUCK DRIVERS:	BUILDING	BASE RATE	\$10.50
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BREATHITT, FLOYD, KNOTT & LETCHER

TRUCK DRIVERS/HEAVY & HIGHWAY:

Truckhelper and warehouseman:	HEAVY & HIGHWAY	BASE RATE	\$16.65
		FRINGE BENEFITS	5.80

CLASSIFICATIONS **RATE AND FRINGE BENEFITS**
TRUCK DRIVERS: HEAVY/HIGHWAY (CONTINUED):

Driver, winch truck and A-Frame when used in transporting materials:	HEAVY & HIGHWAY	BASE RATE	\$16.75
		FRINGE BENEFITS	5.80
Driver, (semi-trailer or pole trailer), driver (dump truck, tandem axle), driver of distributor:	HEAVY & HIGHWAY	BASE RATE	\$16.85
		FRINGE BENEFITS	5.80
Driver on mixer trucks (all types):	HEAVY & HIGHWAY	BASE RATE	\$16.90
		FRINGE BENEFITS	5.80
Truck mechanic:	HEAVY & HIGHWAY	BASE RATE	\$16.95
		FRINGE BENEFITS	5.80
Driver (3 tons and under), tire changer and truck mechanic helper:	HEAVY & HIGHWAY	BASE RATE	\$16.98
		FRINGE BENEFITS	5.80
Driver on pavement breakers:	HEAVY & HIGHWAY	BASE RATE	\$17.00
		FRINGE BENEFITS	5.80
Driver (over 3 tons), driver (truck mounted rotary drill):	HEAVY & HIGHWAY	BASE RATE	\$17.19
		FRINGE BENEFITS	5.80
Driver, Euclid and other heavy earth moving equipment and Low Boy:	HEAVY & HIGHWAY	BASE RATE	\$17.76
		FRINGE BENEFITS	5.80
Greaser on greasing facilities:	HEAVY & HIGHWAY	BASE RATE	\$17.85
		FRINGE BENEFITS	5.80

END OF DOCUMENT CR-5-030

AUGUST 2, 2010

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24.

FEDERAL PREVAILING WAGE DETERMINATION

General Decision Number: KY100193 10/07/2011 KY193

State: Kentucky

Construction Type: Heavy
Including Water and Sewer Line Construction

Counties: Bath, Breathitt, Carter, Elliott, Harlan, Harrison, Johnson, Knott, Lawrence, Lee, Leslie, Letcher, Lewis, Magoffin, Martin, Mason, Menifee, Morgan, Nicholas, Owsley, Perry, Pike, Robertson, Rowan and Wolfe Counties in Kentucky.

HEAVY CONSTRUCTION PROJECTS (including sewer/water construction).

Modification Number	Publication Date
0	10/15/2010
1	12/03/2010
2	01/28/2011
3	05/20/2011
4	06/03/2011
5	06/17/2011
6	07/01/2011
7	07/22/2011
8	10/07/2011

CARP0472-008 07/01/2011

BREATHITT, CARTER, ELLIOTT, JOHNSON, KNOTT, LAWRENCE, LETCHER, LEWIS, MAGOFFIN, MARTIN, MASON, MENIFEE, MORGAN, PERRY, PIKE, ROBERTSON, ROWAN & WOLFE COUNTIES

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 25.95	13.18

CARP0549-008 04/01/2010		

BATH, HARLAN, HARRISON, LEE, LESLIE, NICHOLAS & OWSLEY COUNTIES

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 21.34	12.17

ENGI0181-068 07/01/2011		

	Rates	Fringes
OPERATOR:		
Cherry Picker, Crane, Loader, Mechanic, Scraper & Trackhoe.....	\$ 26.50	13.00
Oiler.....	\$ 23.82	13.00

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

All crane operators operating cranes where the length of the boom in combination with the length of the piling leads equal or exceeds one hundred fifty (150) feet, shall receive one dollar (\$1.00) above the rate.

IRON0372-016 06/26/2011

Harrison, Lewis & Robertson Counties; 80% Western part of Mason County; and 95% Western part of Nicholas County

	Rates	Fringes
IRONWORKER, REINFORCING.....	\$ 26.50	17.40

IRON0384-011 05/01/2011

BREATHITT, HARLAN, KNOTT, LEE, LESLIE, LETCHER, OWSLEY & PERRY COUNTIES

	Rates	Fringes
IRONWORKER, REINFORCING.....	\$ 24.03	10.19

IRON0769-017 06/01/2011

BATH, CARTER, ELLIOTT, JOHNSON, LAWRENCE, MAGOFFIN, MARTIN, MENIFEE, MORGAN, PIKE, ROWAN & WOLFE COUNTIES; 20% EASTERN PART OF MASON COUNTY; and 5% EASTERN PART OF NICHOLAS COUNTY

	Rates	Fringes
IRONWORKER, REINFORCING.....	\$ 30.96	18.07

* LABO0189-032 07/01/2011

BATH, BREATHITT, HARLAN, HARRISON, LEE, LESLIE, LETCHER, MASON, MENIFEE, NICHOLAS, OWSLEY, PERRY, ROBERTSON & WOLFE COUNTIES

	Rates	Fringes
LABORER		
Grade Checker.....	\$ 20.81	10.85
Pipelayer.....	\$ 21.06	10.85

* LABO1445-009 07/01/2011

CARTER, ELLIOTT, JOHNSON, KNOTT, LAWRENCE, LEWIS, MAGOFFIN, MARTIN, MORGAN, PIKE & ROWAN COUNTIES

	Rates	Fringes
LABORER		
Grade Checker.....	\$ 20.81	10.85
Pipelayer.....	\$ 21.06	10.85

SUKY2010-142 09/14/2010		

	Rates	Fringes
LABORER: Common or General.....	\$ 15.42	5.73
LABORER: Flagger.....	\$ 16.65	4.38
OPERATOR: Backhoe/Excavator.....	\$ 19.88	5.47
OPERATOR: Bulldozer.....	\$ 23.30	0.00
OPERATOR: Grader/Blade.....	\$ 20.90	0.00
OPERATOR: Roller.....	\$ 19.57	0.00
OPERATOR: Trencher.....	\$ 19.03	5.78
TRUCK DRIVER: Dump Truck.....	\$ 25.15	0.00

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

=====
 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)).

 --
 In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

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

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

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

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

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

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

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

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

3.) If the decision of the Administrator is not favorable, an interested

party may appeal directly to the Administrative Review Board
(formerly the
Wage Appeals Board). Write to:

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

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

END OF GENERAL DECISION

25.

Approval Letters & Permits

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

January 7, 2011

Mr. Bobby Thorpe, Jr. Chairman
Breathitt Co Water District
1137 Main St., Suite 305
Jackson, Ky 41339

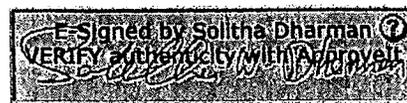
RE: Breathitt Co Water District
AI # 45303, APE20100006
PWSID # 0131012-10-006
KY 1089 Southfork Cont
Breathitt County, KY

Dear Mr. Thorpe:

We have reviewed the plans and specifications for the above referenced project. The plans include the construction of approximately 12,000 LF of 8-inch, 32,500 LF of 6-inch, 3,000 LF of 4-inch, 4,000 LF of 2-inch PVC water lines and 64,000 gallon water storage tank. 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 with the requirements contained in the attached construction permit.

If you have any questions concerning this project, please contact Mr. Hamid Beykzadeh at 502-564-3410, Ext.4822 .

Sincerely,



Solitha Dharman, PE
Supervisor, Engineering Section
Water Infrastructure Branch
Division of Water

SD:HB

Enclosures

C: Honorable Mayor Rose Wolf (City of Jackson)
Abbie Jones (Nesbitt Eng.)
Breathitt County Health Department
Public Service Commission

Kentucky

Distribution-Major Construction

Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

GACT0000000015 (Southfork Water and Storage Tank) 12,000 LF of 8-inch, 32,500 LF of 6-inch, 3,000 LF of 4-inch and 4,000 LF of 2-inch PVC water lines:

Monitoring Requirements:

Condition No.	Parameter	Condition
M-1	Coliform	The presence or absence of total Coliform monitored by sampling and analysis as needed shall be determined for the new or relocated water line(s). Take samples at connection points to existing lines, at 1 mile intervals, and at dead ends without omitting any branch of the new or relocated water line. Sample bottles shall be clearly identified as "special" construction tests. [401 KAR 8:100 Section 1(7), 401 KAR 8:150 Section 4, Recommended Standards for Water Works 8.5.6] This requirement is applicable during the following months: All Year. Statistical basis: Instantaneous determination.
M-2	Coliform	The presence or absence of total Coliform monitored by sampling and analysis as needed shall be determined for the new storage structure(s). With at least 1 sample taken at least 24 hours after the first construction complete sample(s), take 2 or more samples from the yard hydrant, the outlet piping from the storage structure, or a sample tap directly connected to the storage structure. Sample bottles shall be clearly identified as "special" construction tests. [Recommended Standards for Water Works 7.0.18, 401 KAR 8:150 Section 4] This requirement is applicable during the following months: All Year. Statistical basis: Instantaneous determination.

Submittal/Action Requirements:

Coliform:

Condition No.	Condition
S-1	Coliform For new construction projects, the distribution system, using the most expedient method, shall submit Coliform test results to the Cabinet: Due immediately following disinfection and flushing. [401 KAR 8:150 Section 4(2)]

Condition No.	Condition
S-2	For proposed changes to the approved plan, submit information: Due prior to any modification to the Cabinet for approval. Changes to the approved plan shall not be implemented without the prior written approval of the Cabinet. [401 KAR 8:100 Section 1(8)]

Distribution-Major Construction
Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

Submittal/Action Requirements:

Condition
No. Condition

S-3 The person who presented the plans shall submit the professional engineer's certification: Due when construction is complete to the Division of Water. The certification shall be signed by a registered professional engineer and state that the water project has been constructed and tested in accordance with the approved plans, specifications, and requirements. [401 KAR 8:100 Section 1(8)]

Narrative Requirements:
Additional Limitations:

Condition
No. Condition

T-1 Additional Limitations:
Chlorinated water resulting from disinfection of project components shall be disposed in a manner which will not violate 401 KAR 5:031. [401 KAR 8:020 Section 2(20)]

Condition
No. Condition

T-2 This project has been permitted under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the applicant from the responsibility of obtaining any other approvals, permits or licenses required by this Cabinet and other state, federal and local agencies. Further, this permit does not address the authority of the permittee to provide service to the area to be served. [401 KAR 8:100 Section 1(7)]

T-3 Unless construction of this project is begun within 1 year from the issuance date of this permit, the permit shall expire. If requested prior to the permit expiration, an official extension from the Division of Water may be granted. If this permit expires, the original plans and specifications may be resubmitted for a new comprehensive review. If you have any questions concerning this project, please contact the Drinking Water Branch at 502/564-3410. [401 KAR 8:100 Section 1(9)]

T-4 Final approval of facility. Upon completion of construction, the person who presented the plans shall certify in writing that the project has been completed in accordance with the "approved" plans and specifications. The public water supply shall operate the facility consistent with the approved plans and specifications. Any proposed change to the approved plan shall be submitted to the cabinet for approval. The public water supply shall not implement any change to the approved plan without the prior written approval of the cabinet. [401 KAR 8:100 Section 401 KAR 8:100(1)(8)]

Distribution-Major Construction
Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

Narrative Requirements:

Condition No.	Condition
1-5	During construction, a set of approved plans and specification shall be available at the job site at all times. All work shall be performed in accordance with the approved plans and specifications. [401 KAR 8:100 Section 1(7)(a)]

Distribution-Major Construction

Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

Page 4 of 16

PORT0000000025 (WLE) 12,000 LF of 8-inch, 32,500 LF of 6-inch, 3,000 LF of 4-inch and 4,000 LF of 2-inch PVC water lines:

Limitation Requirements:

Condition No.	Parameter	Condition
L-1	Depth	A continuous and uniform bedding shall be provided in the trench for all buried pipe. Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. Stones found in the trench shall be removed for a Depth ≥ 6 in below the bottom of the pipe. [Recommended Standards for Water Works 8.5.2] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.
L-2	Depth	All water lines shall be covered to a Depth ≥ 30 in to prevent freezing. [Recommended Standards for Water Works 8.5.3, 401 KAR 8:100 Section 1(7)] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-3	Diameter	All water lines shall have Diameter ≥ 3 in. [Recommended Standards for Water Works 8.1.4] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-4	Diameter	Water lines with Diameter < 6 in shall not have fire hydrants. [Recommended Standards for Water Works 8.1.5] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-5	Diameter	All new and existing water lines serving fire hydrants or where fire protection is provided shall have Diameter ≥ 6 in. [Recommended Standards for Water Works 8.1.2] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-6	Distance	Water lines shall have a sufficient quantity of valves so that inconvenience and sanitary hazards will be minimized during repairs. A valve spacing Distance ≤ 1.0 mi should be utilized. [Recommended Standards for Water Works 8.2] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.
L-7	Distance	Hydrant drains shall not be connected to sanitary sewers or storm drains and shall be located a Distance > 10 ft from sanitary sewers and storm drains. [Recommended Standards for Water Works 8.3.4] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.
L-8	Distance	Except when not practical, water lines shall be laid a horizontal Distance ≥ 10 ft from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, water lines may be installed closer to a sewer provided that the water lines shall be laid in a separate trench or on an undisturbed shelf located on one side of the sewer at such an elevation that the bottom of the water line is at least 18 inches above the top of the sewer. [Recommended Standards for Water Works 8.6.2] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.

Distribution-Major Construction
Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

PORT0000000025 (continued):

Limitation Requirements:

Condition No.	Parameter	Condition
L-9	Distance	<p>When water lines and sewers cross,</p> <ol style="list-style-type: none"> 1) water lines shall be laid such that either <ol style="list-style-type: none"> a) the top of the water line is a vertical Distance ≥ 18 in below the bottom of the sewer line or b) the bottom of the water line is a vertical Distance ≥ 18 in above the top of the sewer line, 2) 1 full length of the water pipe shall be located so that both joints of the water pipe will be as far from the sewer as possible, and 3) special structural support for the water and sewer pipes may be required. [Recommended Standards for Water Works 8.6.3] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable. <p>The open end of an air relief pipe from automatic valves shall be extended a Distance ≥ 1.0 ft above grade and provided with a screened, downward-facing elbow. The pipe from a manually operated valve shall be extended to the top of the pit. Use of manual air relief valves is recommended wherever possible. [Recommended Standards for Water Works 8.4.2] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.</p>
L-10	Distance	<p>Pipes shall not be installed unless all points of the distribution system remain designed for ground level Pressure ≥ 20 psi under all conditions of flow. [Recommended Standards for Water Works 8.1.1] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.</p>
L-11	Pressure	<p>Pressure ≥ 30 psi must be available on the discharge side of all meters. [401 KAR 8:100 Section 4(2)] This requirement is applicable during the following months: All Year. Statistical basis: Instantaneous determination.</p>
L-12	Pressure	<p>New or relocated water lines shall be thoroughly disinfected (in accordance with AWWA Standard C651) upon completion of construction and before being placed into service. To disinfect the new or relocated lines use chlorine or chlorine compounds in such amounts as to produce an initial disinfectant concentration of at least 50 ppm and a Residual Disinfection ≥ 25 ppm at the end of 24 hours. Follow the line disinfection with thorough flushing and place the lines into service if, and only if, Coliform monitoring applicable to the line does not show the presence of Coliform.</p> <p>If Coliform is detected, repeat flushing of the line and Coliform monitoring. If Coliform is still detected, repeat disinfection and flushing as if the line has never been disinfected. Continue the described process until monitoring does not show the presence of Coliform. [401 KAR 8:150 Section 4(1), Recommended Standards for Water Works 8.5.6] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.</p>
L-13	Residual Disinfection	

Distribution-Major Construction

Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

PORT0000000025 (continued):

Limitation Requirements:

Condition No.	Parameter	Condition
L-14	Velocity	Each blow-off, fire hydrant, or flush hydrant shall be sized so that Velocity ≥ 2.5 ft/sec can be achieved in the water main served by the blow-off or hydrant during flushing. [Recommended Standards for Water Works 8.1.6.b, 401 KAR 8:100 Section 1(7)] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.

Monitoring Requirements:

Condition No.	Parameter	Condition
M-1	leaks	The presence or absence of leaks monitored by physical testing as needed shall be determined in all types of installed pipe. Pressure testing and leakage testing shall be in accordance with the latest edition of AWWA Standard C600. [Recommended Standards for Water Works 8.5.5] This requirement is applicable during the following months: All Year. Statistical basis: Instantaneous determination.

**Narrative Requirements:
Asbestos (Friable):**

Condition No.	Condition
T-1	Asbestos (Friable): If the existing water line to be tapped is asbestos concrete, then the contractor shall conform to OSHA regulations governing the handling of hazardous waste during the process of tapping the asbestos concrete line. Pieces of asbestos concrete resulting from the tap shall be double bagged, placed in a rigid container and disposed of in an approved landfill. [401 KAR 8:100 Section 1(7)]

Distribution-Major Construction
Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

PORT0000000025 (continued):

**Narrative Requirements:
Additional Limitations:**

Condition No.	Condition
T-2	<p>Additional Limitations: Water line installation shall be in accordance with AWWA standards or manufacturer recommendations. [Recommended Standards for Water Works 8.5.1]</p>
T-3	<p>Additional Limitations: Pipes, fittings, valves and fire hydrants shall conform to the latest standards issued by the AWWA or NSF (if such standards exist). PVC and PE piping used must be certified to ANSI/NSF Standard 61. [Recommended Standards for Water Works 8.0.1]</p>
T-4	<p>Additional Limitations: At high points in water lines, where air can accumulate, provisions shall be made to remove the air by means of hydrants or air relief valves. Automatic air relief valves shall not be used in situations where manhole or chamber flooding may occur. [Recommended Standards for Water Works 8.4.1]</p>
T-5	<p>Additional Limitations: All tees, bends, plugs and hydrants shall be provided with reaction blocking, tie rods or joints designed to prevent movement. [Recommended Standards for Water Works 8.5.4]</p>
T-6	<p>Additional Limitations: A fire hydrant or blow-off shall be required at the end of each dead end line. [Recommended Standards for Water Works 8.1.6]</p>
T-7	<p>Additional Limitations: For each fire or flush hydrant, auxiliary valves shall be installed in the hydrant lead pipe. [Recommended Standards for Water Works 8.3.3]</p>
T-8	<p>Additional Limitations: No flushing device, blow-off, or air relief valve shall be directly connected to any sewer. Chambers, pits or manholes containing valves, blow-offs, meters, or other such appurtenances shall not be directly connected to any storm drain or sanitary sewer. Such chambers, pits or manholes shall be drained to absorptions pits underground or to the surface of the ground where they are not subject to flooding by surface water. [Recommended Standards for Water Works 8.1.6, Recommended Standards for Water Works 8.4.3]</p>
T-9	<p>Additional Limitations: If water lines are installed or replaced in areas of organic contamination or in areas within 200 ft of underground or petroleum storage tanks, ductile iron or other nonpermeable materials shall be used in all portions of the water line installation or replacement. [401 KAR 8:100 Section 1(5)(d)6, Recommended Standards for Water Works 8.0.2]</p>

Distribution-Major Construction

Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

PORT000000025 (continued):

Narrative Requirements:

Additional Limitations:

Condition No.	Condition
T-10	Additional Limitations: No water pipe shall pass through or come in contact with any part of a sewer manhole. [Recommended Standards for Water Works 8.6.6]
T-11	Additional Limitations: If a fire sprinkler system is to be installed, a double check detector assembly approved for backflow prevention shall be utilized. The double check detector assembly of the system shall be accessible for testing. [401 KAR 8:100 Section 1(7)]
T-12	Additional Limitations: If water lines cross a stream or wetland, the provisions in the attached Water Quality Certification shall apply. If you have any questions please contact the Water Quality Certification Supervisor of the Water Quality Branch at (502) 564-2225. [401 KAR 8:100 Section 1(7)]

Subfluvial Pipe Crossings:

Condition No.	Condition
T-13	Subfluvial Pipe Crossings: For subfluvial pipe crossings, a floodplain construction permit will not be required pursuant to KRS 151.250 if the following requirements of 401 KAR 4:050 Section 2 are met. <ol style="list-style-type: none">1) No material may be placed in the stream or in the flood plain of the stream to form construction pads, coffer dams, access roads, etc. during construction of pipe crossings.2) Crossing trenches shall be backfilled as closely as possible to the original contour.3) All excess material resulting from construction displacement in a crossing trench shall be disposed of outside the flood plain.4) For erodible channels, there shall be at least 30 inches of backfill on top of all pipe or conduit points in the crossing.5) For nonerodible channels, pipes or conduits in the crossing shall be encased on all sides by at least 6 inches of concrete with all pipe or conduit points in the crossing at least 6 inches below the original contour of the channel. [401 KAR 8:100 Section 1(7)]

Distribution-Major Construction
 Breathitt Co Water District
 Facility Requirements

Activity ID No.: APE20100006

PORT000000025 (continued):

Narrative Requirements:
Subfluvial Pipe Crossings:

Condition No.	Condition
1-14	Subfluvial Pipe Crossings: For subfluvial pipe crossings greater than 15 feet in width, 1) the pipe shall be of special construction, having flexible, restrained, or welded watertight joints, and 2) valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair. Valves shall a) be easily accessible, b) not be subject to flooding, and c) if closest to the supply source, be in a manhole with permanent taps made on each side of the valve to allow insertion of a small meter to determine leakage and for sampling purposes. [Recommended Standards for Water Works 8.7.2]

Distribution-Major Construction

Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

Page 10 of 16

STOR0000000016 (water storage tank) 64,000 gallon:

Limitation Requirements:

Condition No.	Parameter	Condition
L-1	Depth	High and low level Depth \geq 30 ft apart should not be allowed in storage structures providing pressure to a distribution system. [Recommended Standards for Water Works 7.3.2] This requirement is applicable during the following months: All Year. Statistical basis: Maximum.
L-2	Depth	Water Depth \geq 50 percent of the total water depth should be above grade. [Recommended Standards for Water Works 7.0.2.b] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.
L-3	Distance	Sewers, drains, standing water and similar sources of possible contamination shall be a Distance \geq 50 ft from ground-level storage structures. The only exception allowed is for gravity sewers. Gravity sewers are allowed within 50 ft of ground-level storage structures only if they are a) greater than 20 ft from all ground-level storage structures and b) constructed of water main pipe pressure tested in place to 50 psi without leakage. [Recommended Standards for Water Works 7.0.2.b] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-4	Distance	To prevent excessive erosion of storage structure foundations, the overflow and main drain shall either a) discharge to concrete or other stable surfaces (splash pads) which extend a Distance \geq 10 ft away from the base of the storage structure or b) discharge directly into a crushed stone pit that is at least 2' x 2' x 2' which is a Distance \geq 10 ft away from the base of the storage structure. [401 KAR 8:100 Section 1(7)] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.
L-5	Height	Tanks shall have an overflow which is a) brought down to a Height \geq 12 and \leq 24 in above the ground surface, b) of sufficient diameter to permit waste of water in excess of the filling rate, c) open downward, d) screened with twenty-four mesh noncorrodible screen installed within the pipe at a location least susceptible to damage by vandalism, and e) located on the outside of the tank so that any discharge is visible. [Recommended Standards for Water Works 7.0.7] This requirement is applicable during the following months: All Year. Statistical basis: Not applicable.

Distribution-Major Construction
 Breathitt Co Water District
 Facility Requirements

Activity ID No.: APE20100006

STOR000000016 (continued):

Limitation Requirements:

Condition No.	Parameter	Condition
L-6	Height	Tanks shall have manholes that are a) framed a Height ≥ 4 in above the surface of the roof at the opening and b) fitted with a solid watertight cover which overlaps the framed opening and extends down around the frame at least 2 inches. Manholes should be hinged at one side and shall have a locking device. [Recommended Standards for Water Works 7.0.8] This requirement is applicable during the following months: All Year. Statistical basis: Minimum.

Narrative Requirements:

Additional Limitations:

Condition No.	Condition
T-1	Additional Limitations: The materials and designs used for storage structures shall provide stability and durability as well as protection for the quality of the stored water. Steel structures shall follow the AWWA standards wherever they are applicable. Other materials of construction are acceptable when properly designed to meet the requirements in this permit. [Recommended Standards for Water Works 7.0]
T-2	Additional Limitations: The safety of employees must be considered in the design of any storage structure. The design of storage structures shall a) meet or exceed the minimum requirements of pertinent safety laws and regulations in the areas where the structures are constructed, b) include ladders, ladder guards and balcony railings (where applicable), c) locate entrance hatches in safe places, and d) consider confined space entry requirements. [Recommended Standards for Water Works 7.0.12]
T-3	Additional Limitations: Storage structures shall be designed with reasonably convenient access to the interior for cleaning and maintenance. Where space permits, at least 2 manholes shall be provided above the waterline at each water compartment. [Recommended Standards for Water Works 7.0.8]
T-4	Additional Limitations: Fencing, locks on access manholes, and other necessary precautions shall be provided to prevent trespassing, vandalism, and sabotage. [Recommended Standards for Water Works 7.0.4]

Distribution-Major Construction
 Breathitt Co Water District
 Facility Requirements

Activity ID No.: APE20100006

STOR000000016 (continued):

Narrative Requirements:

Additional Limitations:

Condition No.	Condition
T-5	<p>Additional Limitations: All storage structures and their appurtenances, especially the riser pipes, overflows, and vents, shall be designed to prevent freezing. [Recommended Standards for Water Works 7.0.13]</p>
T-6	<p>Additional Limitations: Tanks shall be constructed with no openings except properly constructed vents, manholes, overflows, risers, drains, pump mountings, control ports, and piping for inflow and outflow. For steel tanks, any pipes running through the roof or sidewall must be welded or properly gasketed. For concrete tanks, any pipes running through the roof or sidewall shall be connected to standard wall castings which were poured in place during the forming of the concrete and which should have seepage rings imbedded in the concrete. [Recommended Standards for Water Works 7.0.10]</p>
T-7	<p>Additional Limitations: All finished water storage structures shall have suitable watertight roofs and sidewalls which exclude birds, animals, insects, and excessive dust. [Recommended Standards for Water Works 7.0.3, Recommended Standards for Water Works 7.0.10]</p>
T-8	<p>Additional Limitations: The roof of each storage structure shall be well drained. Downspout pipes shall not enter or pass through storage structures. Parapets or similar structures which would tend to hold water and snow on a storage structure roof shall not be approved unless adequate waterproofing and drainage are provided. [Recommended Standards for Water Works 7.0.11]</p>
T-9	<p>Additional Limitations: Storage structures shall be designed so they can be isolated from the distribution system and drained for cleaning or maintenance without necessitating loss of pressure in the distribution system. [Recommended Standards for Water Works 7.3.2, Recommended Standards for Water Works 7.0.5]</p>
T-10	<p>Additional Limitations: Storage structure drains shall discharge to the ground surface at a drainage structure inlet or splash plate. [Recommended Standards for Water Works 7.3.2, Recommended Standards for Water Works 7.0.7]</p>
T-11	<p>Additional Limitations: No drain on a storage structure may have a direct connection to a sewer or storm drain. [Recommended Standards for Water Works 7.0.5, Recommended Standards for Water Works 7.0.7, Recommended Standards for Water Works 7.3.2]</p>

Distribution-Major Construction
Breathitt Co Water District
Facility Requirements

Activity ID No.: APE20100006

STOR000000016 (continued):

**Narrative Requirements:
Additional Limitations:**

Condition No.	Condition
T-12	<p>Additional Limitations: Main drains from storage structures shall have a twenty-four mesh noncorrodible screen installed within the drain pipe at a location least susceptible to damage by vandalism. [401 KAR 8:100 Section 1(7)]</p>
T-13	<p>Additional Limitations: Storage structures shall be designed to facilitate turn over of water. [401 KAR 8:100 Section 1(7), Recommended Standards for Water Works 7.0.6]</p>
T-14	<p>Additional Limitations: Ground level storage tanks and standpipes shall be equipped with separate inlet/outlet pipes installed on opposite sides of the tank. A check valve shall be installed in the outlet pipe to insure turnover of the water. The inlet pipe</p> <ul style="list-style-type: none">a) shall be installed near the overflow elevation andb) shall not interfere with the overflow discharge. [401 KAR 8:100 Section 1(7)]
T-15	<p>Additional Limitations: Storage structures shall have sufficient capacity, as determined from engineering studies, to meet domestic demands. Additionally, if fire protection is provided, capacity shall also be sufficient to meet fire flow demands. [401 KAR 8:100 Section 1(7), Recommended Standards for Water Works 7.0.1]</p>
T-16	<p>Additional Limitations: The bottom of the structure shall be above</p> <ul style="list-style-type: none">a) the maximum flood level andb) the groundwater level. [Recommended Standards for Water Works 7.0.2]
T-17	<p>Additional Limitations: Storage structure discharge pipes shall be located in a manner that will prevent the flow of sediment into the distribution system. Additionally, removable silt stops should be provided. [Recommended Standards for Water Works 7.0.15]</p>
T-18	<p>Additional Limitations: Appropriate sampling tap(s) shall be provided to facilitate collection of water samples for both bacteriologic and chemical analyses. [Recommended Standards for Water Works 7.0.19]</p>

Distribution-Major Construction
 Breathitt Co Water District
 Facility Requirements

Activity ID No.: APE20100006

STOR000000016 (continued):

**Narrative Requirements:
 Additional Limitations:**

Condition No.	Condition
T-19	<p>Additional Limitations: Storage structures shall not be considered as vents. Open construction between the sidewall and roof is not permitted. Vents shall</p> <ul style="list-style-type: none"> a) prevent the entrance of rainwater, b) exclude birds and animals, and c) exclude insects and dust (as much as compatible with effective venting). <p>Vents may use four-mesh noncorrodible screen. [Recommended Standards for Water Works 7.0.9]</p>
T-20	<p>Additional Limitations: Adequate controls shall be provided to maintain levels in storage structures. The level controls shall be acceptable to the Division of Water. Level indicating devices should be provided at a central location. Overflow and low-level warnings or alarms should be located at places in the community where they will be under responsible surveillance 24 hrs a day. [401 KAR 8:100 Section 1(7), Recommended Standards for Water Works 7.3.3]</p>
T-21	<p>Additional Limitations: If storage structures have a catwalk over the water, the catwalk floor shall be solid with raised edges so that shoe scrapings and dirt will not fall into the water. [Recommended Standards for Water Works 7.0.14]</p>
T-22	<p>Additional Limitations: The area around the storage structure shall be graded in a manner that will prevent surface water from standing within 50 ft of the storage structure. [Recommended Standards for Water Works 7.0.16]</p>
T-23	<p>Additional Limitations: Proper protection shall be given to metal surfaces by</p> <ul style="list-style-type: none"> a) paints or other protective coatings and/or b) cathodic protective devices. [Recommended Standards for Water Works 7.0.17]
T-24	<p>Additional Limitations: If cathodic protection is utilized,</p> <ul style="list-style-type: none"> a) competent technical personnel should design and install the protection and b) a maintenance contract should be provided. [Recommended Standards for Water Works 7.0.17]

Distribution-Major Construction
 Breathitt Co Water District
 Facility Requirements

Activity ID No.: APE20100006

STOR000000016 (continued):

Narrative Requirements:
Additional Limitations:

Condition No.	Condition
I-25	<p>Additional Limitations: If the interior of the storage structure is coated or lined, the coating or lining shall be of a type approved by the Division of Water for use in contact with potable water. [401 KAR 8:020 Section 2(19)]</p>
I-26	<p>Additional Limitations: Paints and coatings</p> <ul style="list-style-type: none"> a) shall meet NSF standard 61, b) shall be acceptable to the Division of Water, c) shall be properly applied and cured, and d) shall not transfer any substance to the water which will be toxic or cause tastes or odors (following curing). <p>Wax coatings shall not be used in any storage structure and must be completely removed before using other paints or coatings in an existing storage structure. [401 KAR 8:100 Section 1(7), Recommended Standards for Water Works 7.0.17]</p>
I-27	<p>Additional Limitations: New water storage structures shall be thoroughly disinfected (in accordance with AWWA Standard C652) upon completion of construction and before being placed into service. To disinfect new storage structures</p> <ul style="list-style-type: none"> 1) remove all scaffolding, planks, tools, rags, and other items that are not part of the structural or operational facilities of the storage structure, 2) clean thoroughly by sweeping, scrubbing, using high-pressure water jets, or some equivalently effective means, and 3) use chlorine or chlorine compounds as subsequently described. <p>Finalize disinfection by</p> <ul style="list-style-type: none"> a) chlorination method 1, described in detail at AWWA Standard C652 Section 4.3.1, b) chlorination method 2, described in detail at AWWA Standard C652 Section 4.3.2, or c) chlorination method 3, described in detail at AWWA Standard C652 Section 4.3.3. <p>See the following conditions for abbreviated descriptions of the methods. Following the finalization of disinfection, place storage structures into service if, and only if, Coliform monitoring applicable to the storage structure does not show the presence of Coliform. If Coliform is detected, flush the tank and repeat Coliform monitoring. If Coliform is still detected, repeat disinfection and flushing as if the tank has never been disinfected. Continue the described process until monitoring does not show the presence of Coliform. [Recommended Standards for Water Works 7.0.18]</p>

Distribution-Major Construction

Breathitt Co Water District
Facility Requirements

Activity ID No.: APEZ0100006

STOR000000016 (continued):

Narrative Requirements:

Condition No.	Condition
T-28	<p>If applicable, chlorination method 1 generally requires</p> <ul style="list-style-type: none">a) filling a storage structure to the overflow level with water providing a free chlorine Residual Disinfection ≥ 10 ppm andb) i) completely draining the storage facility and refilling orii) otherwise reducing (in accordance with method 1) the free chlorine residual to a level appropriate for distribution. [Recommended Standards for Water Works 7.0.18]
T-29	<p>If applicable, chlorination method 2 generally requires</p> <ul style="list-style-type: none">a) scrubbing or spraying the water-contact surfaces of a storage structure with a water solution having an available chlorine concentration = 200 ppm andb) purging of the strong chlorine solution and filling to the overflow level. [Recommended Standards for Water Works 7.0.18]
T-30	<p>If applicable, chlorination method 3 generally requires</p> <ul style="list-style-type: none">a) filling a storage structure to approximately 5% of the total storage volume with water having an available chlorine concentration of 50 ppm,b) continued filling of the storage structure to the overflow level with normal potable water, andc) purging the storage structure so that various disinfection by-products do not reach water consumers. [Recommended Standards for Water Works 7.0.18, 401 KAR 8:100 Section 1(7)]



TRANSPORTATION CABINET

Department of Highways District 10 Office
P.O. Box 621
Jackson, KY 41339
(606) 666-8841
(606) 666-7074 fax

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

November 1, 2011

Breathitt Co. Water District
Estill McIntosh
1137 Main Street
Jackson KY 41339

Re: Permit # 10-0115-11-
Breathitt Co. KY 1098
South Fork Waterline Project

Dear Mr. McIntosh:

After review of subject permit, this office requests that a revised set of plans be submitted. The following changes should be specified. From Station 310+00 on needs to stay off roadway slopes. Additionally, the waterline needs to be installed to specifications, maintain clear zone and existing drainage patterns.

If you have any questions or need further explanation, please call.

Sincerely,

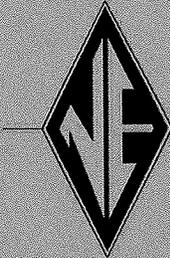
A handwritten signature in cursive script that reads "Greg Potts".

Greg Potts
Tech III Permits
D-10 Jackson

Cc: Nesbitt Engineering
James Wade



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227 North Upper Street
Lexington, KY 40507-1016

Technical Specifications

**KY 1098 South Fork
Contract 1 – Waterline Extension
Breathitt County Water District
Jackson, Kentucky**

November, 2011

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Waterline Extensions
Contract #1 – KY 1098 South Fork

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SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 SCOPE OF WORK COVERED BY THE CONTRACT

- A. These SPECIFICATIONS and the accompanying DRAWINGS describe the WORK to be done and the materials to be furnished for construction of the Contract #1 – KY 1098 South Fork Waterline Project.
- B. The proposed WORK is located along KY 1098 and adjacent side roads, at the location shown on the drawings.
- C. Contract WORK includes:
 - 1. Approximately 17,000 linear feet of 8-inch, 6-inch, 4-inch & 2-inch waterline.
 - 2. Twenty-seven (27) 8-inch, 6-inch, & 4-inch gate valves and boxes.
 - 3. Thirteen (13) Flushing Hydrant Assemblies.
 - 4. Six (6) Post Hydrant Assemblies.
 - 5. Approximately 750 linear feet of 10-inch, 8-inch & 6-inch DR-9 HDPE, directional drilled.
 - 6. Approximately 70 linear feet of 14" steel casing, Bore & Jack.
 - 7. One hundred twenty-three (123) residential meters.
 - 8. Improvements to KY 30 Booster Station & Telemetry.
 - 9. Two (2) Check Valve Assembly Vaults.

1.02 RELATED REQUIREMENTS

- A. Refer to the CONTRACT AGREEMENT for a listing of the CONTRACT DOCUMENTS.
- B. Refer to Section 00700, paragraph 25 for coordination with other contractors.

1.03 WORK SEQUENCE

- A. This project includes WORK that must be properly sequenced and collection system and all other utilities. Sequencing information in this Section is intended to identify constraints with respect to maintenance of existing service, and to assist the CONTRACTOR in planning the WORK. This information does not relieve the CONTRACTOR from his responsibility to complete the WORK on time.

- B. All existing water services must remain active during construction and residential and commercial traffic flow shall be maintained during construction.

Temporary pumping and piping facilities for rerouting the flows shall be provided by the CONTRACTOR as required to maintain service.

- C. The CONTRACTOR shall plan, schedule and accomplish the WORK of this Contract to avoid interruption of system service. Should any such interruptions become necessary, the CONTRACTOR shall notify the OWNER and ENGINEER in writing of such need as far ahead of the interruption as possible, but in no case less than one (1) week. The CONTRACTOR must state in his notification of need to interrupt the existing system at least the following:

1. Construction sequence to minimize the interruption time, and propose time-of-day that WORK would be accomplished.
2. Expected length of time of the interruption.
3. Alternate procedures in the event the expected time is exceeded.
4. List of all equipment and material that must be on hand to complete the WORK.

- D. The ENGINEER shall review the CONTRACTOR'S written notification, and the ENGINEER and OWNER must concur that the proposed interruption is acceptable prior to commencement of the interruption

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all necessary labor, machinery, tools, apparatus, equipment, materials, service, other necessary supplies and perform all work including all excavation and backfilling (without additional compensation, except where specifically set out in these specifications) at the unit or lump sum bid price for the items or work described under PART 2 of this section.

1.02 PROGRESS AND PAYMENTS SCHEDULES

- A. Within fifteen (15) days after the date of formal execution of the AGREEMENT, the Contractor shall prepare and submit to the Engineer, for approval, a construction schedule which depicts the Contractor's plan for completing the contract requirements and show work placement in dollars versus contract time. The Contractor's construction schedule must be approved by the Engineer before any payments will be made on this contract.
- B. Within fifteen (15) days after the date of formal execution of the CONTRACT AGREEMENT, the Contractor shall prepare and submit to the Engineer, for approval, a periodic estimate which depicts the Contractor's cost for completing the contract requirements and show by major unit of the project work, the Contractor's dollar value for the material and the labor (two separate amounts) to be used as a basis for the periodic payments. The Contractor's periodic estimate must be approved by the Engineer before any payments will be made on this contract.
- C. The Engineer's decision as to sufficiency and completeness of the Contractor's construction schedule and periodic estimate will be final.
- D. The Contractor must make current, to the satisfaction of the Engineer, the construction schedule and periodic estimate each time he requests a payment on this contract.
- E. The Contractor's construction schedule and periodic estimate must be maintained at the construction site available for inspection and shall be revised to incorporate approved change orders as they occur.
- F. When the Contractor requests a payment on this contract, it must be on the approved periodic estimate and be current. Further, the current periodic estimate and construction schedule (both updated and revised) shall be submitted for review and approval by the Engineer before monthly payments will be made by the Owner. The Contractor shall submit six (6) current copies of each (periodic estimate and construction schedule) when

requesting payment.

1.03 CONDITIONS FOR PAYMENT

- A. The Owner will make payments for acceptable work in place and materials properly stored on-site. The value of payment shall be as established on the approved construction schedule and periodic estimate, EXCEPT the Owner will retain ten percent (10%) of the work in place and a percentage as hereinafter listed for items properly stored or untested.
- B. No payment will be made for stored materials unless a proper invoice from the supplier is attached to the pay request. Further, no item whose value is less than \$1,000.00 will be considered as stored materials for pay purposes.
- C. Payment for pipeline items shall be limited to eighty percent (80%) of the bid price until the pipeline items have been tested and accepted by the Engineer.
- D. Payment for equipment items shall be limited to eighty-five percent (85%) of their scheduled value (materials portion only) until they are set in place. Eighty-five percent (85%) payment for stored materials and equipment shall be contingent on proper on-site storage as recommended by the manufacturer or required by the Engineer.
- E. Payment for equipment items set in-place shall be limited to ninety percent (90%) of their scheduled value until they are ready for operation and have been certified by the manufacturer. Ninety percent (90%) payment for installed equipment shall be contingent on proper routine maintenance of the equipment in accordance with the manufacturer's recommendations.
- F. Payment for equipment items set in place and ready for operation shall be limited to ninety-five percent (95%) of their scheduled value until all acceptance tests have been completed and the required manufacturer's pre-startup operator's training has been completed.
- G. Payment for the labor portion of equipment items will be subject only to the degree of completeness and the appropriate retainage.
- H. The Owner may reduce the percent of retainage once the project has achieved satisfactory progress and is at the fifty percent (50%) mark. If the percent of retainage is reduced, the dollar amount of retainage for work-in-place will not be reduced but will remain constant following the fifty percent (50%) constructed status. The retainage on the equipment items shall be determined as defined hereinbefore.
- I. Additionally, the Owner may reinstate the retainage to a full ten percent (10%) of the scheduled value of work-in-place and material items should the Owner, at its discretion, determine that the Contractor is not making satisfactory progress or there is other specific cause for such withholding.

1.04 CLAIMS FOR EXTRA WORK

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- A. If the Contractor claims that any instructions by Drawings or otherwise involve extra cost, he shall give the Engineer written notice of said claim within ten (10) days after the receipt of such instructions, and in any event before proceeding to execute the work, stating clearly and in detail the basis of his claim or claims. No such claim shall be valid unless so made.
- B. Claims for additional compensation for extra work, due to alleged errors in spot elevations, contour lines, or bench marks, will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material, or performing more work than would reasonably be estimated from the Drawings and/or topographical maps issued.
- C. Any discrepancies which may be discovered between actual conditions and those represented by the topographical maps and/or Drawings shall at once be reported to the Engineer, and work shall not proceed, except at the Contractor's risk, until written instructions have been received by him from the Engineer.
- D. If, on the basis of the available evidence, the Engineer determines that an adjustment of the Contract Price or time is justifiable, the procedure shall then be as provided herein for "Changes in the Work".
- E. By execution of this Contract, the Contractor warrants that he has visited the site of the proposed work and fully acquainted himself with the existing site conditions relating to construction and labor, and that he fully understands the facilities, difficulties, and restrictions attending the execution of the work under this Contract. The Contractor further warrants that he has thoroughly examined and is familiar with the Drawings, Specifications and all other documents comprising the Contract. The Contractor further warrants that by execution of this Contract his failure when he was bidding on this Contract to receive or examine any form, instrument or document, or to visit the site and acquaint himself with conditions there existing, in no way relieves him from any obligation under the Contract, and the Contractor agrees that the Owner shall be justified in rejecting any claim based on facts regarding which he should have been on notice as a result thereof.

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

- A. The value of extra (additional) or omitted work shall be determined in one or more of the following ways:
 - 1. On the basis of the actual cost of all the items of labor (including on-the-job supervision), materials, and use of equipment, plus a maximum 15 percent for added work or a minimum 15 percent for deleted work which shall cover the Contractor's general supervision, overhead and profit. In case of subcontracts, the 15 percent

(maximum for added work and minimum for deleted work) is interpreted to mean the subcontractor's supervision, overhead and profit, and an additional 5 percent (maximum for added work and minimum for deleted work) may then be added to such costs to cover the General Contractor's supervision, overhead and profit. The cost of labor shall include required insurance, taxes and fringe benefits. Equipment costs shall be based on current rental rates in the areas where the work is being performed but, in no case shall such costs be greater than the current rates published by the Associated Equipment Distributors, Chicago, Illinois.

2. By estimate and acceptance in a lump sum.
 3. By unit prices named in the Contract or subsequently agreed upon.
- B. Provided, however, that the cost or estimated cost of all extra (additional) work shall be determined in advance of authorization by the Engineer and approved by the Owner.
- C. All extra (additional) work shall be executed under the conditions of the original Contract. Any claim for extension of time shall be adjusted according to the proportionate increase or decrease in the final total cost of the work unless negotiated on another basis.
- D. Except for over-runs in contract unit price items, no extra (additional) work shall be done except upon a written Field Order Directive, or Change Order from the Engineer, and no claim on the part of the Contractor for pay for extra (additional) work shall be recognized unless so ordered in writing by the Engineer.

PART 2 – PRODUCTS

2.01 TIE INTO EXISTING WATERLINE (Item #1)

Payment for the **Tie Into Existing Waterline** will be made at the contract unit price for this item. The CONTRACTOR shall locate existing potable waterline, (verifying exact location, orientation, material, and size); furnish and install appropriate sized D.I.M.J. fittings (including but not limited to reducer, 90 bend, 45 bend, etc.); making the necessary cuts of existing waterline to make final connection and to terminate existing waterline as shown on the drawings. Payment shall also include excavation (including rock excavation); dewatering; bedding material; temporary shoring, sheeting, and bracing; all mechanical components; testing of connection; any necessary asphalt or concrete pavement restorations; regrading; seed and straw of all areas disturbed during construction activities; erosion control measures; and all other materials not specifically delineated herein, but necessary to complete the construction of the tie in by means of tapping sleeve. Testing shall be conducted on everything except the final connection to the existing waterline; any additional material required to conduct testing is incidental and to be included in unit cost as set

forth in bid. Decommissioning of the existing waterlines (as displayed in drawings) after construction is completed shall also be included in the CONTRACTOR'S contract bid price for this item. Contractor shall notify OWNER and the City of Jackson 72 hours prior to any connections to existing waterlines are commenced.

2.02 COMBINATION AIR RELEASE VALVE & BOX (Item #2)

Payment for the **Combination Air Relief Valve (CARV)** assembly will be made at the contract unit price per assembly, which shall include compensation for all labor, material and equipment required for furnishing and installing CARV & box; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; terminal for tracer wire; testing of the completed lines; and any utility relocation if necessary. Incidental to the construction of the air release valve shall be valve box, crushed stone, asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, gate valve concrete collar and sidewalks.

Miscellaneous fittings required to complete the installation as shown on the drawings shall be incorporated into the unit price. Such fittings include but are not limited to as adapters, elbows, tees, wyes and mechanical restraint.

2.03 WATERLINES (Item #3 thru Item #8)

Payment for **Waterlines** will be made at the contract unit price per linear foot in place, which shall include compensation for all labor, material and equipment required for furnishing and installing pipe; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; marker posts; Locator; testing of the completed lines; and any utility relocation if necessary. Incidental to the construction of the waterline shall be crushed stone, asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, and sidewalks.

Miscellaneous fittings required to complete the installation as shown on the drawings shall be incorporated into the unit price per linear foot of pipe. Such fittings include but are not limited to as elbows, tees, wyes and mechanical restraint.

2.04 GATE VALVE & BOXES (Item #9 thru Item #11)

Payment for the **Gate Valves & Boxes** will be made at the contract unit price per assembly, which shall include compensation for all labor, material and equipment required for furnishing and installing Gate Valve & Box; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; terminal for tracer wire; testing of the completed valves; and fittings. Incidental to the construction of the Gate Valve & Box shall be valve box, crushed stone,

asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, gate valve concrete collar and sidewalks.

Miscellaneous fittings required to complete the installation as shown on the drawings shall be incorporated into the unit price. Such fittings include but are not limited to as adapters, elbows, tees, wyes and mechanical restraint.

2.05 FLUSHING HYDRANT ASSEMBLY (Item #12)

Payment for the **Flushing Hydrant Assembly** will be made at the contract unit price per assembly, which shall include compensation for all labor, material and equipment required for furnishing and installing hydrant, valve & box; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; marker posts; terminal for tracer wire; testing of the completed lines; and any utility relocation if necessary. Incidental to the construction of the hydrant assembly shall be valve box, crushed stone, asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, gate valve concrete collar and sidewalks.

2.06 POST HYDRANT ASSEMBLY, BLOW OFF (Item #13)

Payment for the **Post Hydrant Assembly** will be made at the contract unit price per assembly, which shall include compensation for all labor, material and equipment required for furnishing and installing hydrant, valve & box; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; marker posts; terminal for tracer wire; testing of the completed lines; and any utility relocation if necessary. Incidental to the construction of the hydrant assembly shall be valve box, crushed stone, asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, gate valve concrete collar and sidewalks.

2.07 CREEK CROSSING, DIRECTIONAL DRILLED (Item #14 thru Item #16)

Payment for **Creek Crossing** will be made at the contract unit price per linear foot, which shall include compensation for all labor, material and equipment required for furnishing and installing pipe, excavation (including rock excavation), dewatering, bedding material, laying, jointing, pipe anchoring, erosion control measures, temporary trench shoring, sheeting and bracing, and initial and final backfill, seed and straw of all areas disturbed during construction activities, tracer wire; marker posts; testing of the completed lines, and any utility relocation if necessary.

Miscellaneous fittings required to complete the installation as shown on the drawings shall be incorporated into the unit price. Such fittings include but are not limited to as adapters, elbows, tees, wyes and mechanical restraint.

2.08 HIGHWAY CROSSING, BORE & JACK (Item #17)

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Payment for the **Highway Crossing, Bore & Jack** will be made at the contract unit price per linear foot, which shall include compensation for all labor, material and equipment required for furnishing and installing highway bore; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; carrier pipe; casing spacers; end seals; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; marker posts; terminal for tracer wire; testing of the completed lines; and any utility relocation if necessary. Incidental to the construction of the hydrant assembly shall be valve box, crushed stone, asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, gate valve concrete collar and sidewalks.

2.09 5/8" x 3/4" INDIVIDUAL RESIDENTIAL METERS (Item #18 & Item #19)

Payment for the **Residential Meters** will be made at the contract unit price per assembly, which shall include compensation for all labor, material and equipment required for installing new meter, furnishing and installing new meter, new meter box, new box lid, new coppersetter, etc; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; and any utility relocation if necessary. Incidental to the construction of the residential meters shall be necessary fittings, any work required to make installation complete, crushed stone, asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, gate valve concrete collar and sidewalks.

New water meters shall be installed per District's ordinances.

2.10 SERVICE TUBING (Item #20 & Item #21)

Payment for **Service Tubing** will be made at the contract unit price per linear foot in place, which shall include compensation for all labor, material and equipment required for furnishing and installing pipe; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; reconnection to existing yoke; testing of the completed lines; and any utility relocation if necessary. Incidental to the construction of the service tubing shall be crushed stone, asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, and sidewalks.

Miscellaneous fittings required to complete the installation as shown on the drawings shall be incorporated into the unit price per linear foot of pipe. Such fittings include but are not limited to as service saddle, elbows, tees, wyes and mechanical restraint.

2.11 LEAK DETECTION ASSEMBLY (Item #22)

Payment for the **Leak Detection Assembly** will be made at the contract unit price per each installation, which shall include compensation for all labor, material and

equipment required for furnishing and installing LEAK DETECTION ASSEMBLY; excavation (including rock excavation); dewatering; bedding material; laying; meter box; copper setter; service tubing; gate valve; box lid; service saddles; initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; marker posts; terminal for tracer wire; testing of the completed lines; and any utility relocation if necessary. Incidental to the construction of the leak detection assembly shall be valve box, crushed stone, asphalt, or concrete surface replacement (in kind), replacement or repair to drainage ditches, rip rap ditches, curb and gutter, gate valve concrete collar and sidewalks.

2.12 WATERLINE MARKER (Item #23)

Payment for the **Waterline Marker** will be made at the contract unit price per assembly, which shall include compensation for all labor, material and equipment required for furnishing and installing Waterline Marker; excavation (including rock excavation); initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; terminal for tracer wire; and identification sticker. Incidental to the construction of the Waterline Marker shall be marker post, identification sticker, replacement or repair to drainage ditches, rip rap ditches, curb and gutter.

2.13 KY 30 EAST BOOSTER STATION IMPROVEMENTS (Item #24)

Payment for the **KY 30 East Booster Station Improvements** will be made at the contract unit price, which shall include compensation for all labor, material and equipment required for furnishing, installing and upgrades to the KY 30 East Booster Station; removal of existing equipment to be replaced; delivery of removed equipment to the OWNER, and startup procedures. Incidental to the improvement of the KY 30 East Booster Station shall be electrical conduit, necessary hardware to hang/secure new control panels, installation of electrical wiring, pulling of existing electrical wiring, miscellaneous hardware, retro-fitting of the existing control panel to accept integration from new VFDs, and any modifications required to make new equipment operational.

2.14 NEW TELEMETRY & TELEMETRY IMPROVEMENTS (Item #25)

Payment for the **New Telemetry & Telemetry Improvements** will be made at the contract unit price, which shall include compensation for all labor, material and equipment required for furnishing, installing and upgrades to the existing telemetry system and the new telemetry equipment; removal of existing equipment to be replaced; startup procedures. Incidental to the improvement of the Telemetry shall be electrical conduit, necessary hardware to secure new tower, installation of electrical wiring, pulling of existing electrical wiring, miscellaneous hardware, retro-fitting of the existing control panel to accept integration from new RTU, upgrades to existing telemetry software at the OWNER's office and any modifications required to make new equipment operational.

2.15 NEW TELEMETRY REPEATER STATION (Item #26)

Payment for the **New Telemetry Repeater Station** will be made at the contract unit

price, which shall include compensation for all labor, material and equipment required for furnishing, installing a new telemetry repeater system and the new solar equipment; programming at existing KY 30 East Booster Station; startup procedures. Incidental to the installation of the telemetry repeater station shall be electrical conduit, necessary hardware to secure new tower, installation of electrical wiring, pulling of existing electrical wiring, miscellaneous hardware, upgrades to existing telemetry software at the OWNER's office and any modifications required to make new equipment operational.

2.16 CHECK VALVE ASSEMBLY VAULT (Item #27)

Payment for the **Check Valve Assembly Vault** will be made at the contract unit price for this item, which shall include compensation for all labor, material and equipment required for furnishing and installing Check Valve Assembly Vault; excavation (including rock excavation); dewatering; bedding material; laying; jointing; pipe anchoring; erosion control measures; temporary trench shoring; sheeting and bracing; initial and final backfill, seed and straw of all areas disturbed during construction activities; tracer wire; marker posts; terminal for tracer wire; internal & external piping as shown on plans; testing of the completed lines; and any utility relocation if necessary.

Miscellaneous fittings required to complete the installation as shown on the drawings shall be incorporated into the unit price. Such fittings include but are not limited to as adapters, elbows, tees, wyes and mechanical restraint.

PART 3 QUANTITIES OF ESTIMATE

- A. Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents, including the Bid Proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall not give cause for claims or liability for damages. The Engineer will not be financially responsible for any omissions from the Contract Documents and therefore not included by the Contractor in his proposal.
- B. Aerial photographs utilized for plan sheets in the Contract Documents are indicated at an approximate scale and shall not be scaled for quantity take-offs. The quantities listed in the bid schedule are given for use in comparing bids and may not be the actual quantities to be installed. It is the Contractor's responsibility to field verify the bid item quantities to be installed prior to the ordering of materials. Payment on unit price contracts are based on actual quantities installed. The Owner or Engineer will not be financially responsible for any shortage of the bid items or overrun of bid items ordered for the quantities.
- C. The actual quantities of all materials to be used for this project shall be field

verified prior to the Contractor ordering the necessary materials. The quantity listed in the bid schedule is given for use in comparing bids and may increase or diminish as may be deemed necessary or as directed by the Owner. Any such increase or diminution shall not give cause for claims or liability for damages. The Engineer or Owner will not be financially responsible for any charges incurred for restocking of materials ordered.

- END OF SECTION -

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 LABOR REGULATIONS ON KENTUCKY PUBLIC WORKS PROJECTS

- A. All Public Works Project submitted for BIDS and constructed by a Public Authority in the State of Kentucky are subject to the provisions of the Kentucky Revised Statutes, Chapter 337, entitled Wages and Hours as may be amended from time to time.

CONTRACTORS are hereby advised that both State and Federal labor wage decisions are applicable to this contract. This does not guarantee nor infer that employees may be obtained for these rates. Should the CONTRACTOR choose or find it necessary to pay higher wage rates, the OWNER will not be liable for such higher rates.

1.02 ACCESS TO WORK

- A. The representative of the OWNER, the ENGINEER, the U.S. Environmental Protection Agency, the Kentucky Division of Water, OSHA and related agencies shall have access to the WORK wherever it is in preparation or progress, and the CONTRACTOR shall provide proper facilities for such access and inspection.

1.03 LOCAL GOVERNMENT REQUIREMENTS

- A. The CONTRACTOR and all SUBCONTRACTORS and SUPPLIERS shall fully comply with all local government requirements.
- B. Construction debris must be disposed in accordance with the local Solid Waste Management Plan, and with DWM regulatory requirement.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used

END OF SECTION

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SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.01 PRE-CONSTRUCTION CONFERENCES

- A. Prior to commencing the work, a pre-construction conference will be held and representatives of the following organizations shall have at least one (1) representative in attendance:

OWNER, ENGINEER, CONTRACTOR, major Subcontractors,
and representatives of the appropriate State and Federal
agencies as they choose.

- B. The pre-construction conference will be for the purpose of reviewing procedures to be followed concerning the orderly flow of required paperwork; coordination of the various parties involved with the project, review of shop drawing submittals, contract time, liquidated damages, payment estimates, change orders, and other items to the parties involved.

1.02 PROGRESS MEETINGS

- A. A progress meeting will be held once each month to review progress of the work, discuss problems encountered or foreseen, coordinate for the following month with the OWNER, and answer any questions as they arise.
- B. The organizations listed under 1.01 above shall have at least one representative in attendance at each meeting.

1.03 SCHEDULE UPDATE MEETINGS

- A. Schedule update meetings shall be in accordance with schedule requirements in Division 1, Section 01310.

PART 2 PRODUCTS

Not Used.

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PART 3 EXECUTION

Not Used.

END OF SECTION

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. This section specifies the general methods and requirements of submissions applicable to the following WORK-related submittals:

1. General Procedures for Submittals
2. Construction Schedule
3. Schedule of Values and Payments
4. Schedule of SHOP DRAWING Submittals
5. SHOP DRAWINGS, Product Data, Samples and O&M Instructions
6. Construction Photographs
7. Test Reports
8. Manufacturer's Certificates
9. Manufacturer's Instructions
10. Contractor's Responsibility
11. Submission Requirements
12. Resubmission Requirements

Additional general submissions requirements are contained in paragraphs 5.1 through 5.7 of the General Conditions. The CONTRACTOR is responsible for the submittal of all weekly payrolls, monthly utilization and other required forms and reports, including reports and forms from his SUBCONTRACTORS. The prompt submittal of all required reports and forms will help to insure the timely processing of pay request. Detailed submittal requirements will be specified in the technical SPECIFICATIONS sections.

1.02 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times:

The CONTRACTOR shall prepare and transmit each submittal sufficiently in advance of performing the related WORK or other

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applicable activities, or within the time specified in the individual WORK section of the SPECIFICATIONS, so that the installation will not be delayed by processing times including disapproval and re-submittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the WORK.

1.03 CONSTRUCTION SCHEDULE

- A. In addition to the progress schedule requirements specified in Article 3 of the General Conditions, the CONTRACTOR shall, within ten (10) days after the NOTICE TO PROCEED provide and submit to the ENGINEER for review the schedule he plans to maintain in order to successfully construct the WORK within the time allotted. The schedule shall account for all WORK of the CONTRACTOR and his SUBCONTRACTORS.
- B. The CONTRACTOR shall update the schedule information monthly and submit the update information to the ENGINEER at the same time the pay estimate is prepared. The schedule shall contain all of the items of the periodic estimate and pay schedule.
- C. The CONTRACTOR bears full responsibility for scheduling all phases and stages of the WORK including his SUBCONTRACTOR WORK to insure its successful prosecution and completion within the time specified in accordance with all provisions of these SPECIFICATIONS.
- D. Refer to Section 01310 for additional requirements.

1.04 SCHEDULE OF VALUES AND PAYMENTS

- A. Within the (10) days after award of the Contract the CONTRACTOR shall submit to the OWNER in triplicate, a breakdown of the pay items, including a schedule of values and a schedule of payments. This breakdown shall be subject to approval by the OWNER, and when so approved shall become the basis for determining progress payments and for negotiation of CHANGE ORDERS, if required.

1.05 SCHEDULE OF SHOP DRAWING SUBMITTALS

- A. The CONTRACTOR shall, within ten (10) days after the NOTICE TO PROCEED provide and submit to the ENGINEER for review a SCHEDULE OF SHOP DRAWING SUBMITTALS. The schedule shall account for all materials used by the CONTRACTOR and his SUBCONTRACTORS.
- B. The schedule shall be organized to reflect the respective specification division under which it applies.

1.06 SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND O & M INSTRUCTIONS

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A. Shop Drawings

1. SHOP DRAWINGS, as defined in the General Conditions, and as specified in the technical SPECIFICATIONS include, but are not necessarily limited to custom-prepared data such as fabrication and erection/installation DRAWINGS, scheduled information, setting diagrams, actual shop WORK manufacturing instructions, custom templates, special wiring diagrams, coordination DRAWINGS, individual system of equipment inspection and test reports including performance curves and certifications, as applicable to the WORK.
2. All details on SHOP DRAWINGS submitted for review shall show clearly the relation of the various parts to the main member and lines of the structure, and where correct fabrication of the WORK depends upon field measurements, such measurements shall be made and noted on the SHOP DRAWINGS before being submitted for review by the ENGINEER.
3. Unless otherwise specified, the CONTRACTOR is not required to resubmit SHOP DRAWINGS on existing equipment. The CONTRACTOR shall, however, be responsible for obtaining all SHOP DRAWINGS and/or other information from the manufacturer necessary to complete the installation and startup of existing equipment.

B. Product Data

1. Product data as specified in individual sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare parts listing, and printed product warranties, as applicable to the WORK.

C. Samples

1. Samples specified in individual sections, included, but are not necessarily limited to, physical examples of the WORK such as sections of manufactured or fabricated WORK, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effects, graphic symbols, and units of WORK to be used by the ENGINEER or OWNER for independent inspection and testing, as applicable to the WORK.

D. Operation and Maintenance Instructions

1. O&M instructions shall conform to Article 5 of the General Conditions (Section 00710) and the particular requirements of the individual sections.
2. Refer to Section 01785 for additional requirements.

1.07 CONSTRUCTION PHOTOGRAPHS

A. Miscellaneous photographs as directed by the ENGINEER or OWNER.

1. Photographs are required on this PROJECT and are the responsibility of the CONTRACTOR. Photographs shall be 3" x 5" color snapshots taken with a standard 35mm camera, or a digital camera with 8 MP minimum. CONTRACTOR shall be responsible for the taking, development, labeling and organizing of the photographs. All photographs shall be identified as to location, date and subject matter. Photographs shall be arranged in a photo album(s) by location, subject matter and date taken. Upon completion of the project, the CONTRACTOR shall supply the OWNER with the negatives or digital photo files. The later, if provided, shall be supplied on CD media in .jpg format.
2. Upon completion of the project, the CONTRACTOR shall provide three (3) professional-quality 8 x 10 color aerial photographs. Prior to photographing, the CONTRACTOR shall confirm with the ENGINEER that the site is ready. The photo shall also be provided in digital format (.jpg) on CD media.
3. The CONTRACTOR, before final payment is made, shall deliver one (1) set of photographic prints and negatives/.jpg's to the OWNER, one (1) set of prints to the ENGINEER, and one aerial photograph to each. Both sets of prints shall be arranged in a photo album(s) and labeled as outlined above.
4. No pay item has been set up for the photographs. The CONTRACTOR shall allow for a minimum of 200 - 3" x 5" color photographs (taken and arranged as outlined above) in his BID.

1.08 TEST REPORTS

- A. Submit for the Architect/Engineer's knowledge as contract administrator or for the Owner.
- B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.09 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the Contractor to Architect/Engineer, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect/Engineer.

1.10 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Architect/Engineer for delivery to owner in quantities specified for Product Data.

1.11 CONTRACTOR'S RESPONSIBILITY

- A. The CONTRACTOR shall review SHOP DRAWINGS, product data and samples prior to submission to determine and verify the following:
 - 1. Field measurements
 - 2. Field construction criteria
 - 3. Catalog numbers and similar data
 - 4. Conformance with the SPECIFICATIONS
- B. All SHOP DRAWINGS submitted by SUBCONTRACTORS for review shall be sent directly to the CONTRACTOR for preliminary checking. The CONTRACTOR shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
- C. The CONTRACTOR shall check all SUBCONTRACTOR'S SHOP DRAWINGS regarding measurements, size of members, materials, and details to satisfy himself that they conform to the intent of the DRAWINGS and SPECIFICATIONS. DRAWINGS found to be inaccurate or otherwise in error shall be returned to the SUBCONTRACTORS for correction before submission thereof.
- D. Each shop drawing, WORKING drawing, sample and catalog data submitted by the CONTRACTOR shall have affixed to it a certification statement, signed

by the CONTRACTOR. The certification shall state that the CONTRACTOR represents that he has determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and has checked and coordinated each item with other applicable review SHOP DRAWINGS and all Contract requirements.

- E. The CONTRACTOR shall notify the OWNER in writing, at the time of submittal, of any deviations in the submittals from the requirements of the CONTRACT DOCUMENTS.
- F. The CONTRACTOR should include the notation "Critical Path" on critical path submittals.
- G. The review of SHOP DRAWINGS, samples or catalog data by the ENGINEER shall not relieve the CONTRACTOR from his responsibility with regard to the fulfillment of the terms of the Contract.
- H. No portion of the WORK requiring a shop drawing, WORKING drawing, sample or catalog data shall be started nor shall any materials be fabricated or installed prior to the review or qualified review SHOP DRAWINGS and data shall be at the CONTRACTOR'S risk. The OWNER will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- I. PROJECT WORK, materials, fabrication, and installation shall conform with reviewed SHOP DRAWINGS, WORKING DRAWINGS, applicable samples, and catalog data.

1.12 SUBMISSION REQUIREMENTS

- A. The CONTRACTOR shall make submittals promptly in accordance with the accepted schedule, and in such sequence as to cause no delay in the WORK or in the WORK of any other CONTRACTOR.
- B. Number of submittals required:
 - 1. SHOP DRAWINGS: Submit six (6) copies.
 - 2. Operation and Maintenance Instructions: Submit six (6) copies.
- C. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The PROJECT title, contract number, and submittal number.
 - 3. CONTRACTOR identification.
 - 4. The names of:

- a. CONTRACTOR
 - b. SUPPLIER
 - c. Manufacturer
5. Identification of the product, with the specification section number.
 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. Identification of revisions on re-submittals.
 10. An 8-inch x 3-inch blank space for CONTRACTOR'S and ENGINEER'S stamps.
- D. Submittals shall be clear and legible. Submittals with facsimile copies will be automatically rejected.

1.13 RESUBMISSION REQUIREMENTS

- A. The CONTRACTOR shall make any corrections or changes in the submittals required by the ENGINEER and resubmit until accepted, in accordance with the following:
1. SHOP DRAWINGS and Product Data:
 - a. Revise initial DRAWINGS or data, and resubmit as specified for the initial submittal.
 - b. Indicate any changes which have been made other than those requested by the ENGINEER.
 2. Samples:
 - a. Submit new samples as required for initial submittal.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

01300-7

END OF SECTION

01300-8

SECTION 01310

PROGRESS SCHEDULES

PART 1 GENERAL

1.01 GENERAL

A. Scheduling Responsibilities

1. In order to provide a definitive basis for determining job progress, a construction schedule of a type approved by the OWNER will be used to monitor the PROJECT.
2. The CONTRACTOR shall be responsible for preparing the schedule and updating on a monthly basis. It shall at all times remain the CONTRACTOR'S responsibility to schedule and direct his forces in a manner that will allow for the completion of the WORK within the contractual period.

B. Construction Hours

1. No WORK shall be done between 8:00 p.m. and 7:00 a.m. nor on Sundays or legal holiday without the written permission of the OWNER. However, emergency work may be done without prior written permission.
2. If the CONTRACTOR, for his convenience and at no additional cost to the OWNER, should desire to carry on his WORK at night or outside the regular hours, he shall submit a written request to the ENGINEER and shall allow nine (9) days for satisfactory arrangements to be made for inspecting the WORK in progress. If permission is granted, the CONTRACTOR shall light the different parts of the PROJECT as required to comply with all applicable Federal, State and local regulations. The CONTRACTOR shall also revise his schedule as appropriate at the next monthly schedule update meeting to reflect the changes in working hours.

C. Progress of the WORK

1. The WORK shall be started within ten (10) days following the NOTICE TO PROCEED and shall be executed with such progress as may be required to prevent delay to other CONTRACTORS or to the general completion of the PROJECT. The WORK shall be executed at such times and in or on such parts of the PROJECT, and with such forces, material and equipment, to assure completion of the WORK in the time established by the Contract.
2. The CONTRACTOR agrees that whenever it becomes apparent from the current monthly Schedule update that delays have resulted and, hence, that the Contract completion date will not be met or when so directed by the OWNER, he will take some or all of the following actions at no additional cost to the OWNER.

- (a) Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of WORK.
- (b) Increase the number of working hours per shift, shifts per working day or days per week, the amount of construction equipment, or any combination of the foregoing to substantially eliminate the backlog of WORK.
- (c) Reschedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised schedule.
- (d) The CONTRACTOR shall submit to the OWNER or the OWNER'S representative for review a written statement of the steps he intends to take to remove or arrest the delay to the critical path in the accepted schedule. If the CONTRACTOR should fail to submit a written statement of the steps he intends to take or should fail to take such steps as required by the Contract, the OWNER may direct the level of effort in manpower (trades), equipment, and work schedule (overtime, weekend and holiday work, etc.), to be employed by the CONTRACTOR in order to remove or arrest the delay to the critical path in the accepted schedule, and the CONTRACTOR shall promptly provide such level of effort at no additional cost to the OWNER.

1.02 CONSTRUCTION SCHEDULE

A. Schedule Submissions

- 1. With ten (10) calendar days of the NOTICE TO PROCEED, the CONTRACTOR shall submit to the ENGINEER five (5) copies of his proposed schedule. The schedule will be the subject of a schedule review meeting with the CONTRACTOR, the ENGINEER and the OWNER or the OWNER'S representative within one (1) week of its submission. The CONTRACTOR will revise and resubmit schedule until it is acceptable and accepted by the OWNER or the OWNER'S representative.

1.03 SCHEDULE UPDATES

A. Monthly Meetings

- 1. A monthly Schedule Update Meeting will be held in conjunction with the applicable progress meeting at the construction site to review and update the Schedule. The Schedule Update Meetings will be chaired by the OWNER or the OWNER'S representative and attended by the CONTRACTOR and the ENGINEER. Actual progress of the previous month will be recorded and future activities will be reviewed. The duration of activities and their logical connections may be revised as needed. Decisions made at these meetings and agreed to by all parties are binding with the exception that no contractual completion dates will be modified without formal written requests and acceptance as specified herein.

B. Conditions Requiring Revisions are as follows:

1. When a delay in completion of any WORK item or sequence of WORK items results in an extension of the PROJECT completion.
2. When delays in submittals or deliveries or work stoppages are encountered which make re-planning or rescheduling of the WORK necessary.
3. When the schedule does not represent the actual prosecution and progress of the PROJECT.

1.04 CONTRACT COMPLETION TIME

A. Causes for Extensions

1. The Contract completion time will be adjusted only for cause specified in this Contract. In the event the CONTRACTOR requests an extension of any Contract completion date, he shall furnish such justification and supporting evidence as the OWNER or the OWNER'S representative may deem necessary for a determination as to whether the CONTRACTOR is entitled to an extension of time under the provision of this Contract. The OWNER, with the assistance of ENGINEER and OWNER'S representative, will, after receipt of such justification and supporting evidence, make findings of fact and will advise the CONTRACTOR in writing thereof.

B. Request for Time Extension

1. Each request for change in any Contract completion date shall be initially submitted to the OWNER within the time frame stated in the General Conditions. All information known to the CONTRACTOR at that time concerning the nature and extent of the delay shall be transmitted to the OWNER at that time. Within the time frame stated in the General Conditions but before the date of final payment under this Contract, all information as required above concerning the delay must be submitted to the OWNER. No time extension will be granted for requests which are not submitted within the foregoing time limits.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

01310-4

SECTION 01456

TESTING TANKS AND RESERVOIRS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Testing wet wells, basins, tanks, and other structures which are to hold wastewater.

1.02 SUBMITTALS

- A. Test Results:
 - 1. Records on tank testing indicating date of test, amount of leakage, amount of evaporation, corrective action if any, and retest results.
- B. Submit in accordance with Section 01300.

PART 2 PRODUCTS

Not Used

PARTS EXECUTION

3.01 GENERAL

- A. CONTRACTOR will provide on-site source of water for testing. Provide pumps and piping required to bring water to point of use.
 - 1. CONTRACTOR shall secure any permits that may be required.

3.02 PREPARATION

- A. Structures shall be subjected to leakage tests after concrete has obtained design strength, and before backfilling or other Work which will cover faces of walls is begun.
- B. Tanks laterally restrained or supported by cross-walls, beams or slabs shall not be tested until such restraining or supporting construction is placed and design strength obtained.
- C. Perform cleaning in accordance with Section 01740.

01456-1

3.03 TESTING

- A. Fill structure with water to liquid level as directed by ENGINEER. After structure has been full for 72 hrs, it will be assumed for purposes of test that absorption of moisture by concrete in structure is complete. Measure change in water level at 24 hr intervals for 3 days.
- B. Fill 55 gal container with water and place next to or in tank. Container shall be used as indicator to measure loss of water due to evaporation. Level of water in 55 gal container shall be measured and recorded for same period as tank.
- C. If drop in water level, adjusted for evaporation in 24 hr period, exceeds 1/10 of 1% of volume of liquid contained in structure, leakage shall be considered excessive.
- D. During test period, examine structure and mark visible leaks or damp spots.
- E. Drain structure to 2 ft minimum below leaks and damp spots, and repair. Method of repair shall be CONTRACTOR'S, subject to requirements of these Specifications and review by ENGINEER.
- F. If leakage excessive, refill structure and retest.
- G. Continue this process until drop in water surface in 24 hr period is less than 1/10 of 1% of volume of liquid held in structure.
- H. Repairs and additional tests shall be made by CONTRACTOR in acceptable manner at no additional cost to OWNER.

END OF SECTION

01456-2

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SANITARY FACILITIES

- A. The CONTRACTOR shall construct and maintain sanitary facilities for his employees and employees of the subcontractors. The CONTRACTOR shall, at completion of the Contract Work, properly dispose of these sanitary facilities.

1.02 UTILITIES

- A. The CONTRACTOR shall be totally responsible for installation, maintenance and cost of his and his sub-contractor's telephone service.
- B. The CONTRACTOR shall install meters at all his points of use of electric, water, and natural gas utilities. The CONTRACTOR shall pay the monthly billed cost from the servicing utility for the CONTRACTOR'S use of these utilities. The CONTRACTOR shall pay any initial installation costs.
- C. If CONTRACTOR requires other utilities, he shall obtain and pay for them.

1.03 MAINTENANCE OF SERVICE IN EXISTING UTILITIES

- A. Where the existing utilities must be disturbed during construction under this Contract, their operation and function shall be maintained by the CONTRACTOR to such a degree that service to customers will be interrupted for minimum time periods only. Such disturbances and any maintenance use of these lines shall constitute no cost to the OWNER. The OWNER shall be notified of interruptions in sufficient time to prepare for them and shall agree to the hour, date, and duration of them before they are undertaken.
- B. Should shutdowns in service be in excess of the time of duration agreed upon, and such excessive shutdown time be due to the CONTRACTOR'S negligence, faulty Work and/or inability to perform, then and in that event, the CONTRACTOR shall be held liable to the OWNER for any and all damages that may accrue to the OWNER, by reason of such excessive shutdown periods.
- C. Digging through services with trenching machines will not be permitted. Upon damage to utility services, such services shall be repaired immediately and tested to the satisfaction of the ENGINEER. The CONTRACTOR shall notify all utility users of impending interruption of service and shall be responsible for all damage resulting from same. Payment for necessary disconnection and reconnection of utility services shall be included as a part of the CONTRACTOR'S bid and no extra compensation will be made for same.

01500-1

- D. The CONTRACTOR shall at all times maintain on hand an adequate supply of repair materials and tools with which to make repair to damaged water, gas and sewer lines. Should the CONTRACTOR inadvertently damage existing utilities, he shall make immediate repair thereto and in no event shall he leave the site before such repair has been made and proven to be successful.
- E. As far as possible, the locations and sizes of existing mains are indicated on the drawings; however, exact locations, pipe materials and sizes cannot be guaranteed. It shall be the responsibility of the CONTRACTOR to locate and uncover existing lines. The CONTRACTOR shall provide all connecting fittings of the correct size and type for each connection to existing lines.

1.04 PROPERTY PROTECTION

- A. Care is to be exercised by the CONTRACTOR in all phases of construction, to prevent damage and/or injury to the OWNER'S and/or other property.
- B. The CONTRACTOR shall avoid unnecessary injury to trees and shall remove only those authorized to be removed by written consent of the OWNER. Fences, gates, and terrain damaged or disarranged by the CONTRACTOR'S forces shall be immediately restored in their original condition or better.

1.05 CONSTRUCTION WARNING SIGNS

- A. The CONTRACTOR shall provide construction warning signs for each location where he is working in the state highway right-of-way or in City or County streets. He will further provide flag men as required and shall abide by all Kentucky Transportation Cabinet, Department of Highways safety rules, including size, type and placement of construction signs.

1.06 RESIDENT OBSERVER OFFICE

- A. The CONTRACTOR shall provide at the beginning of construction and remove at the completion of construction, an office for the exclusive use of the Resident Observer.

The office shall be furnished with a desk, chair and plans table. The office shall be equipped with a one-drawer steel filing cabinet, telephone, electric lights, and plug-in duplex receptacles.

During occupancy, the office shall be supplied with janitor services, adequate heat and air conditioning.

Subject to approval of the ENGINEER, the CONTRACTOR may furnish office space in an existing building or a trailer.

1.07 EXCAVATION

- A. No separate payment for solid rock excavation will be made under this Contract, unless specifically noted on the Bid Form. All excavation shall be

01500-2

considered unclassified, except in locations where solid rock excavation is paid for on a unit price basis.

1.08 ACCESS ROADWAYS

- A. The CONTRACTOR shall construct all access roadways needed during construction, and the planned access roadways for the completed project. The CONTRACTOR shall maintain access roadways continuously during the construction period.
- B. The CONTRACTOR shall maintain all existing roadways within the project site which are used for any purpose by construction operations. The degree and frequency of maintenance shall be adequate to keep existing roadways in a condition at least equal to their condition prior to construction. Road maintenance shall include dust control and sweeping.

1.09 RESPONSIBILITY FOR TRENCH SETTLEMENT

- A. The CONTRACTOR shall be responsible for any settlement caused by the construction, that occurs within one (1) year after the final acceptance of this Contract by the OWNER. Temporary fences shall be provided at no extra cost to the OWNER wherever necessary to keep livestock away from the construction area. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Damaged limbs shall be trimmed and damaged tree trunks shall be treated with wound dressing.

1.10 DAMAGE TO CROPS, LIVESTOCK AND VEGETATION

- A. The CONTRACTOR shall protect crops, livestock and vegetation against damage or injury from construction operations at all times. Crops damaged or equipment access obtained outside of the easements provided shall be the responsibility of the CONTRACTOR. Temporary fences shall be provided at no extra cost to the OWNER wherever necessary to keep livestock away from the construction area.
- B. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Damaged limbs shall be trimmed and damaged tree trunks shall be treated with wound dressing.

1.11 WASTE DISPOSAL

- A. The CONTRACTOR shall dispose of waste, including hazardous waste, off-site in accordance with all applicable laws and regulations.

1.12 CONTRACTOR'S TRAILERS AND MATERIAL STORAGE

- A. The location of the CONTRACTOR'S and Subcontractor's office, work trailers and parking areas for the project shall be subject to the OWNER'S approval.

- B. The CONTRACTOR'S and Subcontractor's material storage yards for the project shall be subject to the OWNERS approval.

1.13 JURISDICTIONAL DISPUTES

- A. It shall be the responsibility of the CONTRACTOR to pay all costs that may be required to perform any of the work shown on the Drawings or specified herein in order to avoid any work stoppages due to jurisdictional disputes. The basis for subletting work in question, if any, shall conform with precedent agreements and decisions on record with the Building and Construction Trades Department, AFL-CIO, dated June, 1973, including any amendments thereto.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

01500-4

SECTION 01510

SURFACE WATER POLLUTION PREVENTION PLAN

PART 1 GENERAL

1.01 EROSION CONTROL MEASURES

Reference Section 2270.

All disturbed areas require erosion control. Erosion control shall consist of both natural and manmade barriers to the transport of sediment from the project area to surrounding areas not disturbed under this project.

This specification focuses on the requirement to avoid introduction of sediment into streams and other natural and manmade waterways and conveyances. A second focus is to prevent the deposition of sediment onto traffic surfaces.

A sediment pond is required to be constructed and completed prior to disturbance of the project area. All storm water run-offs from the project area will be routed to the sediment pond, where practical. Any areas not practical to route to the sediment pond shall be protected by the construction of silt fences between the disturbed area and the receiving stream. Silt fence placement shall be approved by the OWNER or his representative. Prior to beginning construction of the sediment pond, a silt fence will be constructed downstream from the downstream toe of the sediment pond to prevent silt from the construction of the embankment entering the stream.

Surface water from adjacent areas shall not be routed to the sediment pond, but rather routed around the sediment pond area.

PART 2 BEST MANAGEMENT PRACTICES

1.01 TEMPORARY BMP'S FOR

On-site storage tanks – On site storage tanks shall have a containment structure constructed around the tank. The containment structure shall be impervious to the substance stored in the tank and shall have a volume equal to 1.5 times the volume of the storage tank. Provisions shall be made to evacuate any water accumulation inside the containment structure to prevent loss of containment volume.

Stockpile areas – Stockpile areas shall have a silt fence constructed at the lower portion of the stockpile area to trap any sediment generated from the stockpile area.

Parking areas – Parking areas shall have a silt fence constructed at the lower perimeter of the parking area to trap any sediment generated from the parking area. Additionally, should the parking area be adjacent to a paved public road, a gravel pad shall be constructed at the entrance from the public

road to the parking area to prevent tracking of sediment onto the paved public road.

Equipment maintenance areas – Equipment maintenance areas shall have a silt fence constructed along the lower perimeter of the maintenance area to trap any sediment generated from the maintenance area.

Excavation areas – Excavation areas shall have a silt fence constructed at the lower perimeter of the excavation area to trap any sediment generated from the excavation area.

All temporary BMP's shall be maintained in accordance with the operations and maintenance plan until such time as permanent BMP's are constructed and completed, or until such time as the controlled area has been graded, mulched, seeded and vegetation has been restored to the area.

1.02 PERMANENT BMP'S

Permanent BMP's shall consist of diversion ditches, sediment outfall structures, vegetation restoration and leachate containment lagoon as applicable.

1.03 OPERATIONS AND MAINTENANCE PLAN

The CONTRACTOR shall implement the following Best Management Practices (**BMP**) and shall maintain these BMP's until no longer needed or the completion of the project. The CONTRACTOR shall not remove any BMP without the agreement of the OWNER or his representative.

The CONTRACTOR shall have the sole responsibility for compliance with the requirements of the Storm Water Pollution Prevention Plan (**SWPPP**) as described in these BID DOCUMENTS, and shall be required to have a full and complete understanding of the SWPPP and the required BMP's contained in the SWPPP. It shall also be the responsibility of the CONTRACTOR to submit to the Kentucky Division of Water a completed Notice of Intent (**NOI**) prior to beginning work on this project and to submit a completed Notice of Termination (**NOT**) to the Kentucky Division of Water at the completion of this project.

Copies of the above forms are contained in this SECTION.

The required BMP's, the locations to be used, inspection frequency, and approved maintenance actions are shown in the following table.

Location	BMP	Inspection Frequency	Maintenance Action
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On-site Storage Tanks	Containment Structure	1. Daily 2. After rain event	Remove captured water, check for leakage
Stockpile Areas	Silt Fence	1. Weekly 2. After rain event 3. Prior to forecast storm	Clean out surplus silt, repair fence as needed
Parking Areas	Silt Fence Gravel Entrance Pad	1. Weekly 2. After rain event	Clean out surplus silt, repair fence as needed. Add gravel to pad as needed
Equipment maintenance areas	Silt Fence	1. Weekly 2. After rain event	Remove surplus silt, repair fence as needed.
Excavation Areas	Silt Fence	1. Weekly 2. After rain event 3. Prior to forecast storm	Remove surplus silt, repair fence as needed
Project Perimeter	Diversion Ditch	1. Weekly 2. After rain event	Remove accumulated sediment, install erosion protection after completion
Perimeter, along stream buffer	Silt Fence	1. Daily 2. After rain event 3. Prior to forecast storm	Remove accumulated silt when half of depth of fence is covered, straighten posts, replace destroyed sections and spray paint date on repaired sections.
Sediment Pond	Sediment Pond	1. Weekly 2. After rain event 3. Prior to forecast storm	Remove any observed obstructions in spillway systems, remove any surplus sediment accumulation
Inlets	Inlet Protection (aka "Pigs in a Blanket")	1. Weekly 2. After rain event	Remove accumulated silt when half of depth of fence is covered, straighten and replace destroyed sections

1.04 CONTINUING EDUCATION

01510-3

All personnel actively involved in this project, whether associated with the Design A/E or the General Contractor, shall be notified of this SWPPP and shall be given the opportunity to review the S.O.P. prepared by the DOE for SWPPP's.

The General Contractor (CONTRACTOR), before beginning work, shall formally review the SWPPP with his site management staff, including the site superintendent, key foremen, safety officers, designated workmen, etc., as well as with any subsequent replacements. Failure to understand the details of the SWPPP will not be accepted as an excuse for violations.

1.05 OPERATION AND MAINTENANCE GUIDELINES

The CONTRACTOR's jobsite superintendent and project manager shall familiarize themselves with the SWPPP and the requirements of the SOP developed by the DOE.

The CONTRACTOR shall assemble a Maintenance Log Book to be kept on site and accessible by DOW, Project A/E, DOE, etc. Log Book shall include the following:

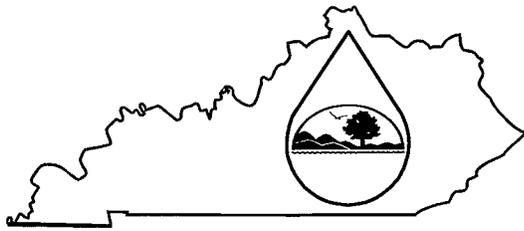
- a. Copy of the NOI
- b. Copy of the General Permit
- c. Copy of the SWPPP (may be kept separate if sheet size dictates)
- d. Maintenance Log Sheets

The CONTRACTOR shall inspect all BMP's on the project at intervals as stipulated on the SWPPP or in the Log Book.

The Contractor shall promptly repair, clean out, replace, or otherwise perform required maintenance of every BMP at stipulated intervals or after a significant rain event. The CONTRACTOR shall make formal notification to the A/E of any BMP's that do not appear to be functioning properly or that may need review.

END OF SECTION

KPDES FORM NOI-SW



Kentucky Pollutant Discharge Elimination System
(KPDES)

**Notice of Intent (NOI)
for Storm Water Discharges
Associated with Industrial Activity Under the
KPDES General Permit**

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a KPDES permit issued for storm water discharges associated with industrial activity. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM (See Instructions on back)

I. Facility Operator Information

Name:		Phone:	
Address:		Status of Owner/Operator:	
City, State, Zip Code:			

II. Facility/Site Location Information

Name:			
Address:			
City, State, Zip Code:			
County:			
Site Latitude: (degrees/minutes/seconds)		Site Longitude: (degrees/minutes/seconds)	

III. Site Activity Information

MS4 Operator Name:			
Receiving Water Body:			
Are there existing quantitative data?	Yes <input type="checkbox"/>	If Yes, submit with this form.	
	No <input type="checkbox"/>		
SIC or Designated Activity Code Primary		2nd	3rd
			4th
If this facility is a member of a Group Application, enter Group Application Number:			
If you have other existing KPDES Permits, enter Permit Numbers:			

IV. Additional Information Required FOR CONSTRUCTION ACTIVITIES ONLY

Project Start Date:		Completion Date:	
Estimated Area to be disturbed (in acres):			
Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	

V. Certification: 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, 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.

Printed or Typed Name:			
Signature:		Date:	

**Kentucky Pollutant Discharge Elimination System (KPDES)
Instructions
Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity
To Be Covered Under The KPDES General Permit**

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, Industrial Section, Kentucky Division of Water at (502) 564-3410.**

WHERE TO FILE NOI FORM

NOIs must be sent to the following address:

**Section Supervisor
Inventory & Data Management Section
KPDES Branch, Division of Water
Frankfort Office Park
14 Reilly Road
Frankfort, KY 40601**

COMPLETING THE FORM

Type or print legibly in the appropriate areas only. If you have any questions regarding the completion of this form call the **Storm Water Contact, Industrial Section, at (502) 564-3410.**

SECTION I - 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 as the name of the facility. The responsible party is the legal entity that 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.

Enter the appropriate letter to indicate the legal status of the operator of the facility.

F = Federal M = Public (other than federal or state)
S = State P = Private

SECTION II - FACILITY/SITE LOCATION INFORMATION

Enter the facility's or site's official or legal name and complete street address, including city, state, and ZIP code.

SECTION III - SITE ACTIVITY INFORMATION

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g., municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges. If data is available submit with this form.

List, in descending order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section II of this application.

If the facility listed in Section II has participated in Part 1 of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other KPDES permits presently issued for the facility or site listed in Section II, list the permit numbers.

SECTION IV - ADDITIONAL INFORMATION REQUIRED FOR CONSTRUCTION ACTIVITIES ONLY

Construction activities must complete Section IV in addition of Sections I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, permits, or storm water management plans.

SECTION V - CERTIFICATION

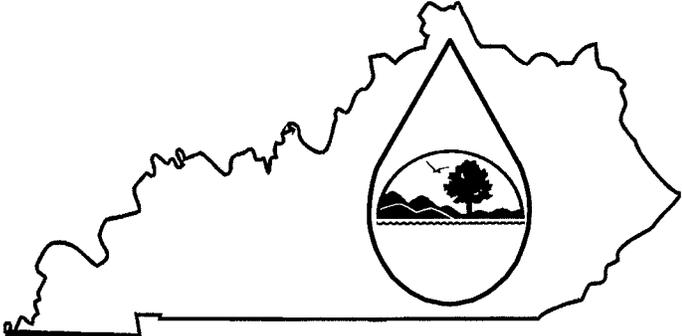
Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

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 officer or ranking elected official.

KPDES FORM NOT-SW

	<p style="text-align: center;">Kentucky Pollutant Discharge Elimination System (KPDES)</p> <p style="text-align: center;">NOTICE OF TERMINATION (NOT) of Coverage Under the KPDES General Permit for Storm Water Discharges Associated with Industrial Activity</p>
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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

SECTION 01788

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Maintain at site one record copy of:
1. Drawings.
 2. Project Manual.
 3. Addenda.
 4. Change orders and other modifications to Contract.
 5. ENGINEER field orders, written instructions, or clarifications.
 6. Approved submittals.
 7. Field test records.
 8. Construction photographs.
 9. Associated permits.
 10. Certificates of inspection and approvals.

1.02 SUBMITTALS

- A. At Substantial Completion:
1. Deliver one marked up set of Drawings to ENGINEER for use in preparation of record drawings.
- B. Accompany submittals with transmittal letter containing following.
1. Date.
 2. Project title and number.
 3. CONTRACTOR'S name and address.
 4. Title of record document.
 5. Signature of CONTRACTOR or authorized representative.

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PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in CONTRACTOR'S field office on-site apart from documents used for construction.
 - 1. Provide files and racks for storage of documents.
 - 2. Provide secure storage space for storage of samples.
- B. Maintain documents in clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- C. Make documents and samples available for inspection by ENGINEER or OWNER.
- D. Failure to properly maintain record documents may be reason to delay a portion of progress payments until records comply with Contract Documents.

3.02 RECORD DOCUMENTS

- A. Label each document "PROJECT RECORD" in neat, large printed letters.
- B. Maintain record set of Drawings and Specifications legibly annotated to show all changes are made during construction.
 - 1. Graphically depict changes by modifying or adding to plans, details, sections, elevations, or schedules.
 - 2. Make changes on each sheet affected by changes.
- C. Record information concurrently with construction progress.
 - 1. Do not conceal Work until required information is recorded.
 - 2. Record changes made by Written Amendment, Field Order, Change Order or Work Directive Change.
 - 3. Give particular attention to concealed equipment and materials that would be difficult to measure and record at later date.

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D. Drawings:

1. Graphically depict changes by modifying or adding to plans, details, sections, elevations, or schedules.
2. Make changes on each sheet affected by changes.
3. Dimensions:
 - a. Depths of various elements of foundation in relation to finish first floor datum.
 - b. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
4. Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
5. Details not on original Drawings.
6. Location and identification of exposed interior piping, including those shown schematically on Drawings.
7. Size of equipment and location including connections.
8. Electrical and Instrumentation:
 - a. Horizontal and vertical locations and size of underground cable, conduit, and duct runs dimensioned from established building lines.
 - b. Plan location and size of interior concealed and exposed feeders.
 - c. Size and location of access panels.
 - d. Variations from original Drawings.

E. Specifications:

1. Mark Specification sections to show substantial variations in actual Work performed in comparison with text of Specifications and modifications.
2. Include variations in products delivered to site and from manufacturer's installation instructions and recommendations.

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3. Give particular attention to substitutions and selection of options and similar information.
4. Note related record drawing information and Product Data.

END OF SECTION

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SECTION 02050

SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required to perform all demolition and removal work as shown on the Drawings and as specified herein. All work shall be carried out in accordance with the Department of Labor:
 - 1. Occupational and Health Hazards (29 CFR - Part 1910).
 - 2. Safety and Health Regulations for Construction (29 CFR - Part 1518).
 - 3. Any applicable local ordinances or codes.
- B. None of the existing river bank slope protection hand placed rip rap may be removed. Sheet piling may be driven through the rip rap and it may be covered by the new construction; however, the rip rap is to remain in place throughout construction.
- C. Demolition work is expected to be minimal. Any removal work shall be carried to the limits necessary for construction of the new work, as specified hereinafter as directed by the ENGINEER.

1.02 RELATED WORK

- A. Concrete work is included in Division 3.
- B. Trench, backfilling, and compacting is included in Division 2.

1.03 SUBMITTALS

- A. Demolition and Removal Plan

The CONTRACTOR shall submit to the ENGINEER for his review and acceptance a plan for demolition and removal work, in accordance with the requirements of Division 1, Section 01300. After the contract is awarded and prior to the commencement of the work, the CONTRACTOR shall meet with the ENGINEER and OWNER and discuss the demolition and removal plan. The plan shall include a schedule for disconnection of utility services and procedures for the careful removal and disposal of materials, and coordination with other work or City activity in progress. Included in the plan must be a detailed description of the methods and equipment to be used for each operation and the sequence of operations.

- 1. Do not proceed with demolition until the ENGINEER has given written

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acceptance of the demolition plan.

2. Obtain all demolition permits required, including any necessary transportation permits, and submit copies of these to the ENGINEER.
- B. The demolition plan submitted for approval shall specifically describe in detail the proposed methods and sequences of implementation of demolition work to be performed in connection with facilities, processes, and systems or parts thereof, the operation of which cannot be interrupted. The CONTRACTOR shall provide and operate at his own expense any temporary equipment, connections, bypasses, or other means necessary to assure continuous operation of facilities which in the opinion of the OWNER cannot be interrupted. Following the completion of work, any such temporary provisions shall be removed from the site to the satisfaction of the OWNER, unless otherwise directed.

1.04 PROTECTION

- A. Erect barriers, fences, guardrails, enclosures, chutes, and shoring to protect personnel, structures, and utilities remaining intact.

- B. Protection of Existing Work

Existing work to remain shall be protected from damage. Work damaged by the CONTRACTOR shall be repaired to match existing work at no additional cost to the OWNER, as directed by the ENGINEER. Provide temporary support and shoring as required for existing materials until new work is installed.

- C. Protection of Utilities

Existing utilities that are indicated or the locations of which are made known to the CONTRACTOR prior to demolition work shall be protected from damage. Damaged utilities shall be repaired as directed by the ENGINEER at no additional cost to the OWNER.

- D. Protection of Personnel

Where the safety of personnel is endangered in the area of removal work, barricades for traffic shall be used and advance notice shall be given to the ENGINEER prior to beginning any such work.

- E. Wherever piping is removed for disposition, adjacent pipe and headers that are to remain in service shall be maintained in service as reconnection is accomplished.

- F. Use of Saw Cuts and Pneumatic Hammers

Saw cuts shall be used wherever applicable. Pneumatic hammers shall only be used with the approval of the ENGINEER.

G. Use of Explosives

Use of explosives will not be allowed on this project..

H. Carry out all demolition work in accordance with the accepted demolition plan and applicable permit requirements.

PART 2 PRODUCTS

None this Section.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify that the use of the facilities and related equipment to be demolished has been discontinued.
- B. Do not commence work until conditions are acceptable to the ENGINEER.

3.02 PREPARATION

- A. Arrange for and verify termination of utility services, including removal of existing utility company appurtenances.

3.03 DEMOLITION

- A. Perform demolition in accordance with the accepted demolition plan, applicable permit requirements, and as directed by the ENGINEER.

3.04 DISPOSAL

- A. Debris and Rubbish Control: Debris and rubbish shall be removed and transported in a manner that will prevent spillage on streets or adjacent areas.
- B. Regulations: Federal, state, and local regulations regarding hauling and disposal shall be complied with.

END OF SECTION

02050-3

SECTION 02110

SITE CLEARING AND GRUBBING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnish all labor and equipment required and perform all clearing, grubbing and stripping of topsoil complete as shown on the DRAWINGS and as specified herein.

1.02 RELATED WORK

None this section.

1.03 SUBMITTALS

None this section.

PART 2 PRODUCTS

None in this Section.

PART 3 EXECUTION

3.01 GENERAL

- A. The proposed areas designated for embankment construction, impoundments, ditches and channel changes, borrow pits, etc., (except any portions thereof that may be reserved) shall be cleared of all trees, timbers, brush, stumps, rubbish and other debris. All this material, unless otherwise specified, shall be burned or otherwise removed, as may be directed and without injury to adjoining property. Burning must be in compliance with any applicable regulations covering open burning and smoke abatement. Where clearing is to be done, all stumps and roots shall be grubbed. No debris will be allowed to be left under or in the embankments. In felling trees near structures and wire lines, necessary precaution must be exercised in order to prevent damage to wire lines, structures, the facilities of others. Payment for all clearing and grubbing shall be incidental to the prices bid for doing other work.

3.02 TREES

- A. Trees (3" caliper and larger) shall not be disturbed by construction without written permission from the OWNER, except in those areas to be cleared. Trees disturbed by construction shall be replaced by the CONTRACTOR with same size and type at no additional cost to the OWNER.

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END OF SECTION

02110-2

SECTION 02140

DEWATERING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnish all labor and equipment required to dewater all excavations. Dewatering of all excavations shall be the responsibility of the CONTRACTOR, and no additional compensation will be allowed for same unless specifically included as a BID item.

1.02 RELATED WORK

- A. Earthwork is included in Division 2, Section 02200.

1.03 SUBMITTALS

Not applicable to this CONTRACT.

PART 2 PRODUCTS

Not applicable to this CONTRACT.

PART 3 EXECUTION

3.01 GENERAL

- A. Dewatering equipment shall be of adequate size and quantity to assure maintaining proper conditions for installing pipe, concrete, backfill or other material or structure in the excavation. Dewatering shall include proper removal of any and all liquid, regardless of its source, from the excavation and the use of all practical means available to prevent surface runoff from entering any excavation. No extra payment shall be made for dewatering.
- B. No sanitary sewer shall be used for the disposal of water from trenches or other excavations. (From "10-States' Standards)

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of earthwork is indicated on the DRAWINGS.
 - 1. Preparation of sub-grade for embankments and outlet works is included as part of this WORK.
 - 2. Engineered fill course for support of concrete slabs is included as part of this WORK.
 - 3. Backfilling of structures, headwalls, channels, manholes and trenches is included as part of this WORK.

- B. Excavation for Mechanical/Electrical WORK

Excavation and backfill required in conjunction with underground mechanical and electrical appurtenances is included as WORK of this Section.

- C. Definition

“Excavation” consists of removal of material encountered to sub-grade elevations indicated and subsequent disposal of materials removed.

1.02 RELATED WORK

- A. Dewatering is included in this Division, Section 02140.
- B. Erosion and sedimentation control is included in this Division, Section 02270.
- C. Piping is included in this Division, Section 02610 and 02700.
- D. Landscaping is included in this Division, Section 02900.

1.03 QUALITY ASSURANCE

- A. Codes and Standards

Perform excavation WORK in compliance with applicable requirements of governing authorities having jurisdiction.

- B. Testing and Inspection Services

Employ, at CONTRACTOR'S expense, testing laboratory acceptable to the OWNER and the ENGINEER to perform soil testing and inspection service for quality control during earthwork operations.

1.04 SUBMITTALS

A. Test Reports

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

1. Test reports on borrow material.
2. Verification of each cutoff trench elevation and embankment sub-grade elevation.
3. Field density test reports, one per 3,000 S.F. per lift.
4. One optimum moisture-maximum dry density curve for each type of soil encountered, per ASTM D-698.

1.05 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.

B. Existing Utilities

Locate existing underground utilities in areas of WORK. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

C. Use of Explosives

Do not bring explosives onto site or use in WORK without prior written permission from authorities having jurisdiction. Contact Kentucky Department of Mines and Minerals for information. CONTRACTOR is solely responsible for handling, storage, and use of explosive materials when their use is permitted.

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 directed 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.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. Definitions

1. Sub-base material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.
2. Backfill and fill materials: Satisfactory soil materials free of debris, waste, frozen materials, vegetable, and other deleterious matter.
3. Embankment Materials

All fill materials shall be obtained from required excavations and from the proposed borrow areas if shown on the CONTRACT DRAWINGS. The selection, blending, routing and disposition of materials shall be subject to the approval of the ENGINEER.

a. Materials - Impervious Clay Core

Core fill materials shall consist of residual overburden soils within the proposed excavation and borrow areas. These soils consist primarily of brown clays classified as CH or CL using the Unified Soil Classification System.

Fill materials shall contain no sod, organic topsoil, brush, roots or other deleterious materials. Fill material shall be rock free and shall be approved by the ENGINEER prior to fill placement.

b. Materials - Random Earth and Rock Zones

Fill material shall consist of non-organic soil or weathered rock with a maximum particle size of 12 inches. Rock materials from the borrow area shall be excavated by ripping methods.

No blasting will be allowed without written permission from the OWNER.

2.02 EMBANKMENT DRAINAGE MATERIALS

- A. No. 57 crushed stone is specified in this Division, Section 02255.
- B. Filter fabric for use with the embankment drain location at the downstream face of the impervious core, where called for in this Section, on the DRAWINGS or as determined by the ENGINEER shall be Mirafi 140N as manufactured by Celanese Corporation, New York, NY 10036, or equal.

PART 3 EXECUTION

3.01 STRIPPING AND TOPSOILING

- A. Before excavation and grading is commenced for structures, the embankment, outlet works or other WORK described hereinafter (except pipelines and manholes) or before material is removed from borrow pits, (impoundment area) the topsoil shall be removed from the areas affected and stockpiled. When final grading is accomplished, the topsoil shall be spread evenly over the disturbed area, except within the impoundment area. Rough grading 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.

3.02 EXCAVATION

- A. All excavation to be unclassified standard excavation includes excavation to sub-grade elevations indicated including excavation of earth, rock (at depth shown on DRAWINGS), bricks, wood, cinders, and other debris.
- B. Differing Site Conditions
 - 1. Should the CONTRACTOR, during the course of construction, encounter subsurface or latent physical conditions differing materially from the subsurface information provided, or unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in this CONTRACT, he shall immediately notify the ENGINEER in writing of the conditions encountered.
 - 2. Upon receipt of such notice, the ENGINEER shall promptly investigate the conditions described by the CONTRACTOR and shall advise the CONTRACTOR in writing of the decision and/or disposition of the conditions encountered.
- C. Unanticipated Material

1. No classification of excavation will be made when unanticipated material is encountered in WORK:
 - a. Excavation includes excavation of pavements and other obstructions visible on ground surface; underground structures, utilities, and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as unauthorized excavation.

- D. Unauthorized excavation consists of removal of materials beyond indicated sub-grade 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 or foundation bases 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 classification, unless otherwise directed by the ENGINEER.

- E. Additional Excavation
 1. When excavation has reached required sub-grade elevations, notify the ENGINEER who will make an inspection of conditions.
 - a. If unsuitable bearing materials are encountered at required sub-grade elevations, carry excavations deeper and replace excavated material as directed 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 using Unit Price Modification prices.

- F. Stability of Excavations
 1. Slope sides of excavations to comply with Federal, State and 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.

- G. Shoring and Bracing

Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross-braces, in good serviceable condition.

1. Establish requirements for trench shoring and bracing to comply with Federal, State and local codes and authorities having jurisdiction.
2. Maintain shoring and bracing in excavations regardless of time period excavation progresses.
3. 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.

H. Dewatering

1. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding PROJECT site and surrounding area.
 - a. Do not allow water to accumulate in excavation. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of sub-grades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
 - b. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavation to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.
2. Prevent impoundment of water behind embankment during construction and prior to acceptance of OWNER.
3. See this Division, Section 02140 for additional requirements.

I. 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.

J. 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. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other WORK.

K. Excavation for Pavements

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

L. 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 and stumps encountered in the 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 may direct. Trenching also includes such items as 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. 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 will be required in areas where machine trenching would result in undue damage to existing structures and facilities.
5. Excavation shall be open trenches.
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.

7. Where sub-grade 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 price set up 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 or after 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.
9. Tunneling may be used 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 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. 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 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 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 sub-base depth indicated or, if not indicated, then to 2 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 sub-base, excavate to sub-base depth indicated or, if not otherwise indicated, to 6 inches below bottom of WORK to be supported.
- e. Except as otherwise indicated, excavate for exterior water-bearing piping (water, steam, condensate, drainage) so top of piping is no less than 2 feet 6 inches below finish grade.
- f. Grade bottoms of trenches as indicated on DRAWINGS, notching under pipe bells to provide solid bearing for entire body of pipe.
- g. Concrete is specified in Division 3.
- h. Do not backfill trenches until tests and inspections have been made and backfilling authorized by the ENGINEER. Use care in backfilling to avoid damage or displacement of pipe systems.
- i. For piping or conduit less than 2 feet 6 inches below surface of roadways, provide 4-inch thick concrete base slab support. After installation and testing of piping or conduit, provide minimum 4-inch thick encasement (sides and top) of concrete prior to backfilling or placement of roadway sub-base.

M. Cold Weather Protection

1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F (1°C).

3.03 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 percentage of relative density, determined in accordance with ASTM D2049, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils). CONTRACTOR is responsible for providing one optimum moisture content - maximum dry density curve in accordance with the above referenced ASTM standards for each soil type encountered.
 - b. Structures, building slabs and steps, pavements: Compact top 12 inches of sub-grade and each 8 inch loose, uncompacted layer of backfill or fill material at 100 percent maximum density for cohesive material or 95 percent relative density for cohesionless material.
 - c. Lawn or unpaved areas: Compact to 6 inches of sub-grade and each 8 inch loose, uncompacted layer of backfill or fill material at 90 percent maximum density for cohesive soils and 90 percent relative density for cohesionless soils.
 - d. Walkways: Compact top 6 inches of sub-grade and each 8 inch loose, uncompacted layer of backfill or fill material at 95 percent maximum density for cohesive material or 95 percent relative density for cohesionless material.
2. Subgrade and backfill for sewers located in fill areas shall be compacted to not less than 95 percent maximum density.

B. Moisture Control

1. Where sub-grade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface or sub-grade, or layer of soil material, to prevent free water from 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 deicing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

3.04 BACKFILL AND FILL

02200-10

A. General

1. Place acceptable soil material in layers to required sub-grade elevations, for each area classification listed below.
 - 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 sub-base material, or satisfactory excavated or borrow material, or combination of both.
 - d. Under steps, use sub-base material.
 - e. Under building slabs, use engineered fill material for a minimum depth of 6 inches.
 - f. Sub-base material or satisfactory excavated or borrow material may be used below engineered fill at building slabs.
 - g. Under piping and conduit, use sub-base material where sub-base is indicated under piping or conduit; shape to fit bottom 90° of cylinder.

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, dampproofing, 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 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, except as otherwise specified in Section 02200-3.05 for embankments.

2. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, adjust 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.
 - a. Before compaction, add moisture to 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. 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. The ENGINEER shall be given a maximum of 24 hours for inspection before backfilling.
2. The backfill over the pipe shall be in accordance with the standard details shown on the DRAWINGS for bedding and backfilling pipe.
3. 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.
4. 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 12 inches in any dimension and to an extent not greater than one-half the backfill materials used. If additional earth is required for backfilling, it

must be obtained and placed by the CONTRACTOR at no additional cost to the OWNER. Filling with rock and earth shall proceed simultaneously, such that no voids are left in the rock. 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. All rock over 1-1/2 inch diameter shall be broomed to remove all earth and loose rock, all immediately following backfilling.

5. 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.
6. In the case of tunnels, 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 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 3 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.
7. 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 passable to traffic at original ground level, until acceptance of PROJECT or replacement of paving or sidewalks.
8. Excavated materials from trenches and tunnels in excess of that required for backfill shall be disposed of on the plant lot, as directed by the ENGINEER.
9. The CONTRACTOR shall protect all sewer, gas, electric, telephone, water, and drain pipes of conduits from damage while pipelines are being constructed and backfilled, and from danger due to settlement of trench backfill.

10. No extra payment shall be made for backfilling of any kind, except as specified herein before. Backfilling shall be included as a part of the Unit Price 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.

3.05 EMBANKMENTS

A. Borrow Excavation

Should insufficient quantities of suitable soil fill material for construction of the embankment be located within the designated areas, where shown on the PLANS, the CONTRACTOR shall obtain suitable soil material conforming to the requirements of the "Materials" SPECIFICATIONS at no additional cost to the OWNER.

Excavation areas shall be excavated and finally dressed in a manner such that no steep or unstable side slopes or other hazardous or unsightly conditions exist.

To the extent that they are needed, all suitable materials shall be used in the construction of permanent earth fill or rock fill. The suitability of materials for specific purposes will be determined by the ENGINEER. The CONTRACTOR shall not waste or otherwise dispose of suitable excavated materials.

B. Foundation Preparation

Foundations for earth fill shall be stripped of all topsoil to remove vegetation and other deleterious materials or shall be excavated as specified.

Except as otherwise specified for foundation benches, earth foundation surfaces shall be graded to remove surface irregularities and shall be scarified parallel to the axis of the fill or otherwise acceptably scored and loosened to a minimum depth of 2 inches. The moisture content of the loosened material shall be controlled as specified for the earth fill, and the surface materials of the foundation shall be compacted and bonded with the first layer of earth fill as specified for subsequent layers of earth fill.

When the original ground surface is sloping at rate of 15 percent or greater, perpendicular to the embankment axis, embankment foundation benches shall be constructed as shown on the CONTRACT DRAWINGS. Preparation of the foundation shall proceed as described in the previous paragraph. Earth abutment surfaces shall be free of loose, uncompacted earth in excess of two inches in depth normal to the slope and shall be at such a moisture content that the earth fill can be compacted against them to effect a good bond between the fill and the abutments.

C. Fill Placement

Fill shall not be placed until the required excavation and foundation preparation have been completed and the foundation has been inspected and approved by the ENGINEER. Fill shall not be placed upon a frozen surface, nor shall snow, ice or frozen material be incorporated in the fill.

Fill shall be placed in approximately horizontal layers. The thickness of each layer before compaction shall not exceed twelve inches (12"). Materials placed by dumping in piles or windrows shall be spread uniformly to not more than the specified thickness before being compacted. Hand compacted fill, including fill compacted by manually directed power tampers, shall be placed in layers whose thickness before compaction does not exceed six inches (6").

Adjacent to pipe or structures, fill shall be placed in a manner which will prevent damage to the pipes or structures and will allow the pipes or structures to assume the loads from the fill gradually and uniformly. The height of the fill adjacent to a structure shall be increased at approximately the same rate on all sides of the structures.

Earth fill for embankments shall also be placed so as to meet the following additional requirements:

1. The distribution of materials, throughout the zone shall be essentially uniform, and the fill shall be free from voids, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding material.
2. If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified parallel to the axis of the fill to a depth of not less than 2 inches before the next layer is placed.
3. The top surfaces of embankments shall be maintained approximately level during construction, except that a crown or cross-slope of not less than 2 percent shall be maintained to insure effective drainage. If the DRAWINGS or SPECIFICATIONS require or the ENGINEER directs that fill be placed at a higher level in one part of an embankment than another, the top surface of each part shall be maintained as specified above.
4. Embankments shall be constructed in continuous layers except where openings to facilitate construction or to allow the passage of stream flow during construction are specifically authorized.
5. Embankments built at different levels as described under (3) or (4) above shall be constructed so that the slope of the bonding surfaces between embankment in place and embankment to be placed is not steeper than 3 feet horizontal to 1 foot vertical. The bonding surface of the embankment in place shall be stripped of all loose material, and shall be scarified, moistened and recompacted when the new fill is

placed against it as needed to insure a good bond with the new fill and to obtain the specified moisture content and density in the junction of the in place and new fill.

6. Embankment materials shall be placed in the zones (impervious core and random earth and rock) shown on the CONTRACT DRAWINGS. Prior to fill placement in the cutoff trench, the bottom of the cut off trench shall be inspected by the ENGINEER. All fractures or joints shall be clean and filled with mortar or concrete unless otherwise directed by the ENGINEER.
7. Fill placement shall then proceed in accordance with CONTRACT PLANS AND SPECIFICATIONS and in a manner such that no steep or unstable slopes or other hazardous or unsightly conditions exist. Fill material used shall conform to requirements of the "Materials" SPECIFICATIONS previously mentioned.
8. Rocks placed in the random earth and rock zones shall be kept at least 2 feet below the embankment surface. The rock shall not be dumped into final position, but shall be distributed by blading or dozing in a manner that will ensure proper placement in the embankment so that voids, pockets and bridging will be eliminated.

D. Compaction

Each layer of fill shall be compacted as necessary to make density of the fill matrix not less than the minimum density specified. The fill matrix is defined as the portion of the fill material finer than the maximum particle size used in the compaction test method specified. Embankment fill shall be compacted to minimum field densities equal to or greater than 95 percent of maximum dry density as determined by the Standard Procter Maximum Dry Density test method ASTM D-698. Moisture content may vary optimum, -2 percent to +1 percent as also determined by ASTM D-698.

CONTRACTOR shall provide one moisture content vs. dry density relationship curve as determined by standard test method ASTM D-698 to help determine optimum moisture content and maximum dry density for each soil type encountered during construction prior to placement in the embankment.

Fill adjacent to structures shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tampers or plate vibrators. Heavy equipment shall not be operated within 2 feet of any structure. Vibrating rollers shall not be operated within 5 feet of any structure. Compaction by means of drop weights operating from a crane or hoist will not be permitted.

The passage of heavy equipment will not be allowed: (a) over cast-in place conduits prior to 14 days after placement of the concrete; (b) over cradled pre-cast conduits prior to 7 days after placement of the concrete cradle; or (c) over any type of conduit until the backfill has been placed above the top

surface of the structure to a height equal to one-half of the clear span width of the structure or pipe or 2 feet, whichever is greater.

E. Testing

During the course of the WORK, the CONTRACTOR will perform such tests as are required to identify the materials, to determine compaction characteristics, to determine moisture content, and to determine density of fill in place. These tests performed by the CONTRACTOR will be used to verify that the fills conform to the requirements of the SPECIFICATIONS. Such tests are intended to provide the CONTRACTOR with the information required by him for the proper execution of the WORK.

Submittals shall be per Section 02200, paragraph 1.04 A.

F. Removal and Replacement of Defective Fill

Fill placed at densities lower than the specified minimum density or at moisture contents outside the specified acceptable range of moisture content or otherwise not conforming to the requirements of the SPECIFICATIONS shall be reworked to meet the requirements or removed and replaced by acceptable fill. The replacement fill, the foundation, and the surfaces upon which the fill is placed shall conform to all requirements of the SPECIFICATIONS for foundation preparation, approval, placement, moisture control and compaction.

3.06 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 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, foundations, 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 sections 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 herein before, 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 re-grade. The surface shall be free from clods greater than 2 inches in diameter. Excavated rock (6 inches maximum size) 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 sub-grade elevations.
 - (2) Walks: Shape surface of areas under walks to line, grade, and cross-section, with finish surface not more than 0.10 ft. above or below required sub-grade elevation.
 - (3) Pavements: Shape surface of areas under pavement to line, grade, and cross-section, with finish surface not more than 0.04 ft. above or below required sub-grade elevation.

C. Grading Surface of Fill Under Building Slabs

1. Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 0.04 ft. when tested with a 10ft. straightedge.

D. Compaction

1. After grading, compact sub-grade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.07 PAVEMENT SUB-BASE COURSE

A. General

1. Sub-base course consists of placing sub-base material, in layers of specified thickness, over sub-grade surface to support a pavement base course.

B. Grade Control

1. During construction, maintain lines and grades including crown and cross-slope of sub-base course.

C. Shoulders

1. Place shoulders along edges of sub-base course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each sub-base course layer. Compact and roll at least a 12 inch width of shoulder simultaneously with compacting and rolling of each layer of sub-base course.

D. Placing

1. Place sub-base course material on prepared sub-grade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting sub-base material during placement operations.
2. When a compacted sub-base course is shown to be 6 inches thick or less, place material in a single layer. When it is shown to be more than 6 inches thick, place material in equal layers, such that no single layer shall be more than 6 inches or less than 3 inches in thickness when compacted.

3.08 BUILDING SLAB ENGINEERED FILL COURSE

A. General

1. Engineered fill course consists of placement of fill material, in layers of indicated thickness, over sub-grade surface to support concrete building slabs.

B. Placing

1. Place fill material on prepared sub-grade 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 it is shown to be more than 6 inches thick, place material in equal layers, such that no single layer shall be more than 6 inches or less than 3 inches in thickness when compacted.

3.09 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction

1. Allow testing service to inspect and report to the ENGINEER on findings and approve sub-grades 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 sub-grade: 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 sub-grade may be based on a visual comparison of each sub-grade with related tested strata, when acceptable to ENGINEER.
 - c. Paved areas and building slab sub-grade: Make at least one field density test of sub-grade 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 the opinion of the ENGINEER, based on testing service reports and inspection, sub-grade or fills which have been placed are below specified density, CONTRACTOR shall provide additional compaction and testing at no additional expense to the OWNER.

3.10 MAINTENANCE

A. Protection of Graded Areas

1. 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

1. 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

1. 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.

3.11 BASIS FOR PAYMENT

Payment for excavation shall be made on a unit price or a lump sum basis where a separate bid item is provided. Otherwise payment for all excavation, trenching and backfilling required for other work, such as structures, pipelines, etc., shall be made on a unit price or lump sum basis bid for that work.

END OF SECTION

SECTION 02255

CRUSHED STONE AND DENSE GRADED AGGREGATE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish and install crushed stone for miscellaneous uses as shown on the Drawings, as called for in the Specifications, or as may be directed in writing by the ENGINEER.
- 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.

PART 2 PRODUCTS

2.01 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, 2000 Edition.
- 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, 2000 Edition, and conforming to the following requirements:

Sieve Size	Percent Passing
1 Inch	100
3/4 Inch	70 - 100
3/8 Inch	50 - 80
#4	30 - 65
#30	10 - 40
#200	4 - 13

PART 3 EXECUTION

3.01 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 inter-granular locking of the aggregate under controlled placement depth. Acceptable compaction can be achieved with pneumatic-tired and tracked vibratory equipment and vibratory rollers.

- B. All compaction operations shall be performed to the satisfaction of the ENGINEER.
- C. Crushed stone shall be placed in those areas as shown on the Drawings and as may be directed by the ENGINEER.

3.02 BASIS FOR PAYMENT

Payment for crushed stone or DGA shall be made on a unit price or a lump sum basis where a separate bid item is provided. Otherwise payment for crushed stone or DGA required for other work show on the PLANS shall be made on a unit price or lump sum basis bid for that work.

END OF SECTION

SECTION 02270

EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment required for erecting, maintaining and removing temporary erosion and sedimentation controls as shown on the Drawings and as specified herein.
- B. Temporary erosion controls include, but are not limited to grassing, mulching, seeding, watering, and reseeding on all disturbed surfaces including waste area surfaces and stockpile and borrow area surfaces; scheduling work to minimize erosion and providing interceptor ditches at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits.
- C. Temporary sedimentation controls include, but are not limited to, silt dams, silt fences, traps, barriers, staked straw-bale diversions and appurtenances at the foot of sloped surfaces, which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits.
- D. CONTRACTOR is responsible for providing and maintaining effective temporary erosion and sediment control measures during construction or until final controls become effective.
- E. The erosion and sedimentation controls where shown on the Drawings and/or specified herein are intended to provide the required environmental protection. However, should additional controls be directed by the ENGINEER, CONTRACTOR shall furnish, install and maintain additional mulching and straw-bale diversions to control erosion and sedimentation to the satisfaction of the ENGINEER at no additional cost to OWNER.
- F. Construction methods that will minimize siltation and erosion shall be employed. The CONTRACTOR shall take steps to minimize unnecessary excavation and disturbing or uprooting trees and vegetation. The CONTRACTOR is prohibited from dumping soil or debris, or pumping silt-laden water into a stream. Cleanup, grading, seeding and planting or restoration of all work areas shall begin immediately. Exposed areas shall not remain unprotected for more than seven days. (From "10-States' Standards")

1.02 RELATED WORK NOT INCLUDED

- A. Site clearing and grubbing is included in this Division, Section 02110.
- B. Dewatering is included in this Division, Section 02140
- C. Landscape work is included in this Division, Section 02900.

- D. Final erosion protection measures are included in this Division, Section 02200.

PART 2 PRODUCTS

- A. Erosion control blanket where called for in this Section, on the Drawings, or as determined by the ENGINEER, shall be AMXCO Curlex Blanket as manufactured by American Excelsior Company, Arlington, TX 76011, or equal.
- B. Rip-rap lining where called for in this Section, on the Drawings or as determined by the ENGINEER shall be Class III or Class II lining as shown on the Drawings and as specified in Section 703 of the 2000 edition of the Kentucky Department of Highways "Standard Specifications for Road and Bridge Construction."

For Class III, no less than 80 percent, by volume, of individual stones shall range in size from 1/4 to 1-1/2 cubic feet. Stones of smaller sizes are permissible for use in filling voids in the upper surface and dressing to the proper slope. In addition to the above referenced specifications, individual stone dimensions are limited to 4 inches (minimum) and 24 inches (maximum).

For Class II lining, no more than 20 percent of the finished product shall pass through square openings 5 inches by 5 inches.

- C. Filter fabric for use with rip-rap where called for in this Section, on the Drawings, or as determined by the ENGINEER, shall be Mirafi 700X as manufactured by Celanese Corporation, New York, NY 10036, or equal.
- D. Silt fence fabric where called for in this Section, on the Drawings or as determined by the ENGINEER shall be Mirati 100X as manufactured by Celanese Corporation, New York, NY 10036, or equal.

PART 3 EXECUTION

3.01 GENERAL

- A. Erosion control practices shall be adequate to prevent erosion of all disturbed and/or all regraded areas.
- B. Earthwork procedures shall be as specified in this Division, Section 02200.
- C. Silt fences shall be located and staked in all disturbed locations and/or all regraded where erosion may occur.

3.02 TEMPORARY SEEDING

02270-2

- A. This item shall consist of seeding a temporary cover of grass, or grass and small grain, on areas disturbed on the construction site, which will not be redisturbed within a 60 day period. The determination of the area to be temporarily seeded and the time of seeding shall be made by the ENGINEER.
- B. The seed mixtures to be used for temporary cover will be governed by the time of year the seeding is accomplished. The mixture of seeding shall be as follows:
1. Time of Seeding - February 15 to June 1

Rye 1-1/2 bushels and rye grass 25 pounds per acre; or tall fescue 30 pounds and rye grass 20 pounds per acre.
 2. Time of Seeding - June 2 to August 15

Tall fescue 30 pounds and rye-grass 20 pounds per acre; or, spring oats 2 bushels and rye grass 30 pounds per acre.
 3. Time of Seeding - August 16 to February 14

Rye 2 bushels and rye grass 20 pounds per acre; or, tall fescue 30 pounds and rye- grass 20 pounds per acre.
 4. Lime will not be required for temporary seeding.
 5. Fertilizer at the rate of 400 pounds per acre of 10-10-10 fertilizer, or equivalent, broadcast uniformly on the area to be seeded.
 6. All seed shall be broadcast evenly over the area to be seeded and culti-packed or otherwise pressed into the soil. Seed and fertilizer may be mixed together and applied after the seed has been prepared.
 7. Mulch for temporary seeding will not be required except on those areas, in the ENGINEER'S opinion, which are too steep to hold the seed without protective cover.

3.03 RIP-RAP LINING

- A. Rip-rap lining shall be constructed to the lines and grades and at the location designated on the Drawings.

The filter fabric shall be placed at the locations shown on the Drawings. The surface to receive the fabric shall be prepared to a relatively smooth condition free of obstructions, debris or sharp objects that may puncture the fabric. Construction equipment will not be permitted to operate directly on the fabric.

The fabric shall be placed with long dimension parallel to the channel or embankment centerline and shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. If more than one strip is necessary, the strips

shall overlap a minimum of 3 feet. Transverse laps shall be placed so the upstream strip laps over the downstream strip.

Fastener pins shall be installed through both strips of overlapped fabric at no less than 5 foot intervals along a line through the midpoint of the lap, and at any other locations as necessary to prevent any slippage of the fabric.

Fabric shall be covered with the rip-rap lining within 14 calendar days after placement of the fabric. Fabric not covered within this time shall be removed and replaced at the CONTRACTOR'S expense if the ENGINEER determines that damage or deterioration is evident.

The fabric shall be protected from damage due to the placement of the channel lining by limiting the height of drop of the material at no greater than 3 feet or by placing a cushioning layer of sand on top of the fabric before dumping the material, at the CONTRACTOR'S option. The CONTRACTOR shall demonstrate that the placement technique will prevent damage to the fabric.

Placement of channel lining shall begin at the toe of the channel and proceed upstream. The lining shall be placed to conform to the template shown on the Drawings. The lining need not be compacted but shall be placed upgrade in a manner to ensure that the larger rock fragments are uniformly distributed and the smaller rock fragments serve to fill the spaces between the larger rock fragments in such a manner as will result in a well keyed, densely placed, uniform layer of lining of the specified thickness. Hand placing will be required only to the extent necessary to secure the results specified above.

3.04 MAINTENANCE OF CONTROLS AND PERFORMANCE

- A. Erosion and sedimentation controls shall be inspected weekly and after significant rainstorms. Replace silt fencing which is damaged filter stone which is dislodged, erosion control blanket which is damaged, and make other necessary repairs.
- B. Should any of the temporary erosion and sediment control measures employed by the CONTRACTOR fail to produce results consistent with normal and acceptable standards of the industry. The CONTRACTOR shall immediately take whatever steps are necessary to correct the deficiency at his own expense.
- C. Remove all temporary erosion and sedimentation controls as final landscaping and grading is performed.

3.05 CONSTRUCTION ALONG OR ACROSS AN INTERMITTENT OR PERENNIAL STREAM

The following special considerations shall be given to construction along or across an intermittent or perennial stream:

- A. Development/excavation shall be performed during low flow periods to minimize disturbance.
- B. When crossing a stream, the pipe shall be laid perpendicular to the stream bank to minimize the direct impacts to the streambed.
- C. When working adjacent to a stream, soil erosion control structures shall be placed parallel to all streams to minimize entry of silt into the stream.
- D. All disturbed instream habitat shall be returned to its original condition upon completion of construction in the area.
- E. The contractor shall take every possible measure to preserve the tree canopy overhanging the stream.
- F. Streambanks shall be reseeded immediately with the stream bank seed mix described in Section 02900, following completion of the stream crossing, disturbed surfaces shall be restored to original contours, and excess materials removed to a properly confined upland area.

END OF SECTION

SECTION 02326

STEEL CASING PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Steel casing pipe shall be furnished and installed as shown on the DRAWINGS and specified herein.

1.02 RELATED WORK

- A. Erosion and sedimentation control is included in this Division, Section 02270.
- B. Piping is included in this Division, Section 02700.
- C. Landscaping is included in this Division, Section 02900.

PART 2 PRODUCTS

2.01 STEEL CASING PIPE

- A. Steel casing or jack pipe shall be plain end steel pipe with a minimum yield strength of 35,000 psi and tensile strength of 60,000 psi per API-5L Grade B material. The steel pipe supplied shall be manufactured by the seamless, electric-weld, submerged arc weld or gas metal-arc weld process as specified in API-5L. Certifications of 35,000 psi minimum yield strength shall be furnished by the CONTRACTOR.
- B. The inside diameter shall be at least 2 inches greater than the largest outside diameter of the carrier pipe, joint or couplings for carrier pipe less than 6" in diameter and at least 4" greater for carrier pipe 6" and over in diameter unless otherwise noted on the plan sheets. In all cases, the casing pipe shall be great enough to allow the carrier pipe to be removed subsequently without disturbing the casing pipe or roadbed.
- C. Casing pipe shall have minimum wall thickness as shown in the following table:

Nominal Diameter (Inch)	Nominal Thickness (Inch)	Nominal Diameter (Inch)	Nominal Thickness (Inch)
Under 10	0.188	24	0.438
10 - 12	0.250	26	0.438
14 - 16	0.281	28 - 30	0.500

PART 3 EXECUTION

3.01 TUNNELING, BORING OR JACKING

- A. Boring or jacking as specified herein shall be located as shown on DRAWINGS. All other casing pipe installations shall be open cut trench.
- B. Tunneling under paving, railroads, buildings and underground structures is included as an alternate to boring or repaving required by open cut trenching at no extra cost to the OWNER. Bore and casing pipe is also included as an alternate to tunneling. Backfilling of tunnels shall be mechanically tamped in not more than 3-inch layers and with material rendered suitable for tamping before being placed in tunnel unless otherwise shown on the DRAWINGS. No payment will be made for tunnels less than 3 feet long.
- C. In tunneling under buildings, the CONTRACTOR will held responsible for all damage by his operations and methods of excavation and backfilling.
- D. Should the CONTRACTOR elect and receive permission to tunnel and bore, other than locations designated on the DRAWINGS or required by the ENGINEER to be tunneled or bored, the entire compensation therefore shall be the same as the unit prices bid for installation in open trench, including paving replacement, but not including bore or unit prices.
- E. At locations where tunneling or boring or jacking is called for on the DRAWINGS, in addition to the unit prices for permanent tunnel, tunnel liner, temporary tunnel, boring or jacking and/or casing pipe, payment will be made for furnishing and laying carrier pipe inside the tunnel or casing pipe. No payment will be made for separate trench and backfill unit price items where permanent tunnel, tunnel liner, temporary tunnel, boring or jacking and/or casing pipe unit prices is paid.
- F. Boring or jacking under highways, railroads, sidewalks, pipelines, etc., shall be done at the locations shown on the DRAWINGS. It shall be performed by mechanical means and accurate vertical and horizontal alignment must be maintained. When shown on the DRAWINGS, casing pipe shall be used and shall be installed inside bored holes concurrently with boring, or jacking.

3.02 STEEL CASING PIPE INSTALLATION

02326-2

- A. Steel casing pipe shall be of the size and wall thickness as shown on the DRAWINGS or specifications.
- B. When casing pipe is jacked, concurrent with boring, all joints shall be solidly welded. The weld shall be such that the joint shall be of such strength to withstand the forces exerted from the boring and jacking operation as well as the vertical loading imposed on the pipe after installation. The weld shall also be such that it provides a smooth, non-obstructing joint in the interior of the pipe, which will allow easy installation of the carrier pipe without hanging or abrasion to the carrier pipe upon installation.
- C. When casing pipe is installed in open trench or permanent tunnel, it shall be bedded and backfilled as specified in Division 2. When casing pipe is installed in temporary tunnel, it shall be laid accurately to alignment of proposed pipeline and at an elevation below proposed pipeline necessary to support it at the planned elevation. Bedding and backfill for casing pipe in temporary tunnel shall be as specified in Division 2.
- D. Casing pipe in open trench, permanent tunnel and temporary tunnel shall be joined by welding such that it will not be moved out of alignment or grade and will prevent backfill material from entering joint. Where casing pipes are shown on the DRAWINGS to be equipped with vent pipes, vents shall be installed as shown on the DRAWINGS with cost of the same included in the price bid for the casing pipe unless otherwise specified.

3.03 CARRIER PIPE IN CASING PIPE INSTALLATION

A. Pipeline Spacers

Carrier pipes shall be centered inside casing pipe throughout the length of the casing pipe. Centering shall be accomplished by the installation of polyethylene pipeline spacers attached to the casing pipe in such a manner as to prevent the dislodgment of the spacers as the carrier pipe is pulled or pushed through the casing pipe. Spacers shall be of such dimensions to provide (1) full supportive load capacity of the carrier pipe and contents; (2) of such thickness to allow installation and/or removal of the pipe; and (3) to allow no greater than 1/2 inch movement of the carrier pipe within the casing pipe after the carrier pipe is installed. Installation shall be in accordance with manufacturer's recommendations.

- B. Upon completion of installation of the carrier pipe, the annular space at the ends of the cover pipe shall be sealed to prevent the entrance of groundwater, silt, etc., into the casing pipe. The seal shall be a manufactured product specially made for this purpose. The seal shall be the best seal type constructed of synthetic rubber with stainless steel banding straps. Seals may be of the "pull-on" or "wrap around" type as manufactured by Advance Products and Systems, Inc. or equal.

3.04 BASIS FOR PAYMENT

02326-3

Steel Casing Pipe shall be paid for at the unit price bid or lump sum bid and shall include all work incidental to making a complete installation such as excavation, carrier pipe, bedding, backfill, painting, testing, disinfection, cleanup, seeding, etc.

END OF SECTION

SECTION 02411
FOUNDATION DRAINAGE

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of foundation drainage system work is shown on the DRAWINGS and includes the following:
 - 1. Footing drainage system.

1.02 RELATED WORK

- A. Dewatering is included in this Division, Section 02140.
- B. Earthwork is included in this Division, Section 02200.

PART 2 PRODUCTS

2.01 DRAINAGE PIPE AND FITTINGS

- A. Furnish drainage pipe complete with bends, reducers, adapters, couplings and joint materials.
- B. Perforated Polyvinyl Chloride Pipe: ASTM D 2729-latest revision.
- C. Joint Screening
 - 1. Furnish joint screening for each open-joint portion of drain lines of the following:
 - a. Synthetic drainage fabric.

2.02 SOIL MATERIALS

- A. Impervious Fill
 - 1. Clay gravel and sand mixture capable of compacting to a dense composite.
- B. Drainage Fill
 - 1. Evenly graded mixture of natural or crushed gravel, crushed stone, and natural sand with 100 percent passing a 1-1/2 inch sieve and 0-5 percent passing a No. 4 sieve.
- C. Filtering Material

02411-1

1. Crushed stone shall be No. 57 graded in accordance with the Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction, latest edition.

PART 3 EXECUTION

3.01 INSTALLATION

A. Impervious Fill at Footings

1. After concrete footings have been cured and forms removed, place impervious fill material on sub-grade adjacent to bottom of footing. Place and compact impervious fill to dimensions indicated or, if not indicated, not less than 6 inches deep and 12 inches wide.

B. Filtering Material

1. Place supporting layer of filtering material over compacted sub-grade where drainage pipe is to be laid to depth indicated or, if not indicated, to a compacted depth of not less than 4 inches.
 - a. After testing drain lines, place additional filtering material to a 4 inch depth around sides and top of drains.

C. Laying Drain Pipe

1. Lay drain pipe solidly bedded in filtering material. Provide full bearing for each pipe section throughout its length, to true grades and alignment, and continuous slope in direction of flow.
 - a. Lay perforated pipe with perforations down and joints tightly closed in accordance with pipe manufacturer's recommendations. Provide collars and couplings as required.

D. Testing Drain Lines

1. Test or check lines before backfilling to assure free flow. Remove obstructions, replace damaged components, and retest system until satisfactory.

E. Drainage Fill

1. Place drainage fill over drain lines after satisfactory testing and covering of drain lines with filtering material. Completely cover drain lines to a width of at least 6 inches on each side and above top of pipe to within 12 inches of finish grade.
2. Place fill material in layers not exceeding 3 inches in loose depth and compact each layer placed.

- a. Overlay drainage fill material with one layer of 15 pound asphalt - or tar-saturated felt, or synthetic drainage fabric, overlapping edges at least 4 inches.
3. Fill to grade: Apply impervious fill material over compacted drainage fill at footing drains, placing material in layers not exceeding 6 inches in loose depth and thoroughly compacting each layer. Carry impervious fill to indicated finish elevations and slope away from building perimeter.

END OF SECTION

SECTION 02500

BITUMINOUS PAVEMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Extent of bituminous pavement paving, as applicable, is shown on the Drawings, including roads, driveways, and parking areas.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Unless noted, all specification designations refer to the Kentucky Transportation Cabinet Department of Highways Standard Specification for Road and Bridge Construction, latest edition. Appropriate portions of the referenced sections of the Specifications shall apply, but all work shall be included in lump sum bid items described herein unless otherwise specified or shown on the Drawings.
- B. Preparation of sub-base is specified in this Division, Section 02200.
- C. Crushed stone and dense graded aggregate are specified in this Division, Section 02255.

1.03 QUALITY ASSURANCE

- A. Performance: Bituminous seal coat that fails as the result of not meeting the requirements of these Specifications shall be corrected as directed by the ENGINEER at the CONTRACTOR'S expense.
- B. The design plant mix shall be submitted to the ENGINEER for review and acceptance. The submittal shall include the last date the mixture was approved by the Kentucky Transportation Cabinet Department of Highways for use on a state road project; and the location where the mixture was recently used, and the name and address of the paving contractor.

PART 2 PRODUCTS

2.01 BITUMINOUS CONCRETE SURFACE MATERIAL

- A. Aggregates shall meet the applicable requirements of Sections 804 and 805.
- B. Bituminous materials shall meet the applicable requirements of Section 806.
- C. Bituminous materials for tack coat shall be one of the following:

SS-1, SS-1h, CSS-1, CSS-1h, AE-60, RS-1, CRS-1, RC-70 or RC-250.

- D. Steel, wood, or other suitable material shall be of size and strength necessary to resist movement during bituminous placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.

2.02 BITUMINOUS SEAL COAT MATERIAL

- A. Coarse aggregate shall be Kentucky Transportation Cabinet Department of Highways Standard No. 8, graded 3/8 inch to No. 8, meeting applicable requirements of Section 805.
- B. Bituminous materials shall meet applicable requirements of Section 806.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

- A. The road shall be swept with an approved mechanical sweeper and with wire hand brooms, when necessary. Special care shall be taken to clean the edges of the surface so that full width of the roadway to be treated shall be uniformly clean. Where any mud or earth exists, it shall be removed sufficiently in advance of application of bituminous material to allow the surface to become thoroughly dry.

3.02 BITUMINOUS CONCRETE PAVING

- A. Composition of Mixtures: Surface pavement mixture, meeting requirements of Sections 401.02 through 401.05 shall be used as determined by local plant mix availability. The mixture shall have been approved recently by the Kentucky Transportation Cabinet Department of Highways, used recently on a state project, and conform to the requirements below when tested in accordance with ASTM D 1559-latest revision:

Stability, minimum pounds	750
Flow, 0.01 inch	Min. 8, Max. 16
Percent air voids	Min. 3, Max. 5

Minimum voids in mineral aggregate, percent:	
3/4 inch	14
1 inch	13
Voids filled, percent	Min. 75, Max. 85

- B. Construction Methods: Construction requirements shall conform to applicable requirements of Sections 401, 402, and 407.
- C. A tack coat shall be required to bond new paving to the surface of concrete or brick pavements and bases or existing bituminous surfaces. It shall be applied at the rate of 0.8 pound (0.1 gal.) per square yard at the following range of application temperatures:

SS-1, SS-1h, CSS-1, CSS-1h, AE-60	70-160°F
RS-1, CRS-1	70-140°F
RC-70	120°F
RC-250	165°F

* These temperatures should be used unless higher temperatures are required for satisfactory coverage. Caution must be exercised to prevent fire or explosion.

- D. When SS-1, SS-1h, CSS-1, CSS-1h, or AE-60 is furnished for tack material, it shall be diluted with an equal quantity of water conforming to Section 803, shall be thoroughly mixed prior to application, and shall be applied a sufficient time in advance of the paver to ensure that all water has evaporated before the bituminous concrete mixture is placed. The application rate shall be 0.8 pound (0.1 gal.) per square yard of the diluted SS-1, SS-1h, CSS-1, CSS-1h, or AE-60.
- E. Where bituminous paving is placed against vertical surfaces such curbs, gutters, manhole frames, valve boxes, etc., the vertical face shall be tack coated to seal the surface. Where these surfaces are inaccessible to pressure distributor, the tack coat may be brushed or broomed into place. The tack coat shall not be allowed to spill over onto any horizontal surface outside the area to be paved.
- F. Unless otherwise indicated on the Drawings or in these Specifications, the compacted thickness of the bituminous concrete paving shall be a minimum of 2 inches and the minimum ambient temperature for placing shall be 40°F. Mixing and laying temperatures shall be as follows:

Aggregates	Min. 240°F - Max. 325°F
Asphalt Cement	Min. 225°F - Max. 325°F
Mixture at Plant (measured in truck)	Min. 240°F - Max. 325°F
Mixture when Placed (measured in truck when discharging)	275° + 20°F **

** The 275°F + 20°F mixture placing temperature is based on 275°F being about the ideal temperature for obtaining optimum compaction under average conditions. However, when the distance between the asphalt plant and the job is such that specified placing temperatures are covered, insulated hauling equipment as described below are used, the minimum placing temperature shall be 225°F.

- G. Trucks for hauling bituminous mixtures shall have tight, clean, and smooth metal beds that have been sprayed with a minimum amount of soap emulsion, paraffin oil, or other approved material that is not detrimental to the mixture to prevent the mixture from adhering to the beds. All trucks shall be equipped with covers of sufficient size to completely cover the loaded material and all covers shall be securely fastened in place before the truck leaves the plant. Truck beds shall be insulated, when necessary, to maintain the specified temperature to the point of delivery. Any truck causing excessive

segregation of material by its spring suspension or other contributing factors shall be discharged from the work until such conditions are corrected.

- H. The CONTRACTOR shall have an accurate thermometer on the job at all times for verifying all temperature requirements and for taking temperature measurements whenever requested by the ENGINEER or OWNER. The CONTRACTOR shall closely control temperature and compaction requirements to achieve quality bituminous paving and related work.
- I. Bituminous paving that fails as the result of not meeting the requirements of these Specifications shall be removed and replaced as directed by the ENGINEER at the CONTRACTOR's expense.

3.03 BASIS FOR PAYMENT

Payment for Bituminous Pavement shall be made on a unit price or a lump sum basis where a separate bid item is provided.

END OF SECTION

SECTION 02515

PORTLAND CEMENT CONCRETE PAVING

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Extent of portland cement concrete paving for driveways and walks is shown on the DRAWINGS.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Prepare sub-base as specified in this Division, Section 02200.
- B. Concrete and related materials are specified in Division 3.
- C. Bituminous pavement is specified in this Division, Section 02500.
- D. Crushed stone and dense graded aggregate are specified in this Division, Section 02255.

1.03 SUBMITTALS

- A. Furnish samples, manufacturer's product data, test reports, and materials certifications as required in referenced sections for concrete and joint fillers and sealers.

1.04 JOB CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Utilize flagmen, barricades, warning signs and warning lights as required.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
- B. Use flexible spring steel forms or laminated boards to form radius bends as required.
- C. Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.

- D. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A 185-85.
- E. Furnish in flat sheets, not rolls, unless otherwise acceptable to ENGINEER.
- F. Concrete Materials: Comply with requirements of Division 3, Section 03300, for concrete materials, admixtures, bonding material, curing materials, and others as required.
- G. Expansion Joint Materials: Comply with requirements of Division 7, Section 07900 for preformed expansion joint fillers and sealers.
- H. Anti-spalling Compound: 50% (by volume) boiled linseed oil and 50% (by volume) commercial grade kerosene or mineral spirits.

2.02 CONCRETE MIX, DESIGN AND TESTING

- A. Comply with requirements of Division 3, Section 03300 for concrete mix design, sampling and testing, and quality control, and as herein specified.
- B. Design mix to produce normal-weight concrete consisting of portland cement, aggregate, water-reducing or high-range water-reducing admixture (super plasticizer), air-entraining admixture and water to produce the following properties:
 - 1. Comprehensive Strength: 4,000 psi, minimum at 28 days.
 - 2. Slump Range: 8 inches for concrete containing HRWR admixture (super-plasticizer); 3 inches for other concrete.
 - 3. Air Content: 5% to 8%.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

- A. Remove loose material from compacted sub-base surface immediately before placing concrete.
- B. Proof-roll prepared sub-base surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

3.02 FORM CONSTRUCTION

- A. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of WORK and so that forms can remain in place at least twenty-four (24) hours after concrete placement.
- B. Check completed form WORK for grade and alignment to following tolerances:

1. Top of forms not more than 1/8 inch in 10 feet.
2. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.

- C. Clean forms after each use, and coat with form release agent as often as required to ensure separation from concrete without damage.

3.03 REINFORCEMENT

- A. Locate, place and support reinforcement as specified in Division 3, Section 03300, unless otherwise indicated.

3.04 CONCRETE PLACEMENT

- A. General: Comply with requirements of Division 3 sections for mixing and placing concrete, and as herein specified.
- B. Do not place concrete until sub-base and forms have been checked for line and grade. Moisten sub-base if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- C. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate and care to prevent dislocation of reinforcing, dowels, and joint devices.
- D. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place a construction joint.

3.05 JOINTS

- A. General: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
- B. Weakened-plane (contraction) Joints (Wk-PIJt): Provide weakened-plane (contraction) joints, sectioning concrete into areas as shown on DRAWINGS. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:
1. Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.
- C. Construction Joints (CnsJt): Place construction joints at end of placements and at locations where placement operations are stopped for a period of more

than 1/2 hour, except where such placements terminate at expansion joints.

- D. Construct joint as shown or, if not shown, use standard metal keyway-section forms.
- E. Expansion Joints (ExpJt): Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects unless otherwise indicated.
- F. Locate expansion joints at 50 ft. o.c. for each pavement lane, unless otherwise indicated.
- G. Extended joint fillers full-width and depth of joint, and not less than 1/2 inch or more than 1 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
- H. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together.
- I. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
- J. Fillers and Sealants: Comply with the requirements of Division 7, Section 07900, for preparation of joints, materials, installation, and performance.

3.06 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10 foot straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slab, gutters, back top edge of curb and formed joints with an edging tool, and round to a 1/2 inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 - 1. Broom finish, by drawing a fine-hair broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide a fine line texture acceptable to ENGINEER.
 - 2. On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff-bristled broom, perpendicular to line of traffic.

- E. Do not remove forms for twenty-four (24) hours after concrete has been placed. Any form removal, clean ends of joints and point up any minor honeycombed areas. Remove and replace areas or sections with major defects.

3.07 CURING

- A. Protect and cure finished concrete paving, complying with requirements of Division 3, Section 03300. Use curing and sealing compound or approved moist-curing methods.
- B. Do not use liquid membrane-forming material where anti-spalling treatment will be applied.
- C. Anti-spalling Treatment: Apply compound to concrete surfaces no sooner than twenty-eight (28) days after placement. Apply to clean, dry concrete free of oil, dirt, and other foreign materials, in two sprayed applications. First application, 60 sq. yd. per gallon. Allow complete drying between applications.

3.08 REPAIRS AND PROTECTIONS

- A. Repair or replace broken or defective concrete.
- B. Protect concrete from damage until acceptance of WORK. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface and spillage of materials as they occur.
- C. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.

END OF SECTION

SECTION 02610

GENERAL PIPING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals necessary to install and test pipe and fittings as shown on the Drawings and required by the Specifications.
- B. Piping shall be located substantially as shown. The ENGINEER reserves the right to make such modifications in locations as may be found desirable to avoid interference between pipes or for other reasons. Pipe fitting notation is for the CONTRACTOR'S convenience and does not relieve him from laying and jointing different or additional items where required without additional compensation.
- C. Wherever the word pipe or piping is used it shall mean pipe and fittings unless otherwise noted.
- D. All references to Standards/Specifications shall mean the latest revision.

1.02 RELATED WORK

- A. Trenching, backfilling and compacting are included in this Division, Section 02200.
- B. Concrete is included in Division 3, Section 03300.

1.03 DESCRIPTION OF SYSTEM

- A. Piping shall be installed substantially as shown on the Drawings so as to form a complete smooth flow path and workable system.
- B. The piping and materials specified herein are intended to be standard types of pipe for use in transporting the fluids as indicated on the Drawings. The pipe and fittings shall be designed, constructed, and installed in accordance with the best practices and methods and the manufacturer's recommendations.

1.04 QUALIFICATIONS

- A. All pipe and fittings under this section shall be furnished by manufacturers who are fully experienced, qualified, and regularly engaged in the manufacture of the materials to be furnished.

1.05 SUBMITTALS

- A. The CONTRACTOR shall submit to the ENGINEER for review in accordance with Division 1, Section 01300, complete sets of shop drawings showing layout and details of materials, joints and methods of construction and installation of the pipe, specials and fittings required.
- B. Before fabrication and/or shipping of the pipe is begun, the CONTRACTOR shall submit for approval a schedule of pipe lengths for the entire job. All pipe furnished under the Contract shall be fabricated in full accordance with the approved Drawings.

1.06 INSPECTION

- A. The manufacturer shall inspect all pipe joints for out-of-roundness and pipe ends for squareness. The manufacturer shall furnish to the ENGINEER a notarized affidavit stating all pipe meets the requirements of applicable ASTM Specifications, these Specifications, and the joint design with respect to square ends and out-of-round joint surfaces.

PART 2 PRODUCTS

2.01 REINFORCED CONCRETE PIPE

- A. Except as otherwise specified herein, pipe shall conform to ASTM Standard Specifications for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe, Designation C 76 latest revision, Class IV, Wall B. The tabulated reinforcement given in the tables shall be the minimum required. The pipe interior shall be smooth and even, free from roughness, projections, indentations, offsets, or irregularities of any kind. The concrete mass shall be dense and uniform. The supplier is responsible for the performance of all inspection requirements as specified in ASTM C 76 latest revision. A complete set of records of the tests shall be submitted to the ENGINEER.
- B. Non-air-entraining portland cement conforming to ASTM Specifications C 150 latest revision, Type II shall be used, except as otherwise approved in writing to the ENGINEER. The use of a non-bleeding, water-reducing, dispersing agent may be permitted subject to the specific approval of the ENGINEER. The use of any other admixture will not be permitted.
- C. Fine aggregate shall consist of washed inert natural sand conforming to the requirements of ASTM Specifications C 33 latest revision, except for gradation, with a maximum loss of 7.5 percent when subjected to 5 cycles of the soundness test using magnesium sulfate. Coarse aggregate shall consist of well-graded crushed stone or washed gravel conforming to the requirements of ASTM Specifications C 33 latest revision, except for gradation, with a maximum loss of 7.5 percent when subjected to 5 cycles of the soundness test using magnesium sulfate.

- D. The 28-day compressive strength of the concrete, as indicated by cores cut from the pipe shall be not less than 4,000 psi. The concrete mass shall be dense and uniform. The average absorption shall not exceed 5.0 percent of the dry weight and no specimen shall exceed 5.3 percent of the dry weight. Reinforcement shall be circular for all concrete pipe. Reinforcement in the bell and spigot shall be adequate to prevent damage to concrete during shipping, handling and installation. Core indicating reinforcing steel having less than 85 percent bond shall be cause for rejection of the lot of pipes.
- E. Pipe may be rejected for any of the following reasons:
1. Exposure of any wires and positioning spacers or chairs used to hold the reinforcement case in position, or steel reinforcement in any surface of the pipe, except for ends of longitudinal reinforcing.
 2. Transverse reinforcing steel found to be in excess of 1/4 inch out of specified position after the pipe is molded.
 3. Any shattering or flaking of concrete at a crack.
 4. Air bubble voids (bugholes) on the interior and exterior surfaces of the pipe exceeding 1/4 inch in depth unless properly and soundly pointed with mortar or other approved material.
 5. Unauthorized application of any wash coat of cement or grout.
 6. A deficiency greater than 1/4 inch from the specified wall thickness.
 7. A variation from the specified internal diameter in excess of 1 percent or interior surfaces which have been reworked after placing of concrete. The variation in internal diameter permitted herein does not apply to gasket contact surface in gasketed joint pipe.
 8. A hollow spot (identified by tapping the internal surface of the pipe) which is greater than 30 inches in length or wider than 3 times the specified wall thickness. Repair of such defective areas not exceeding these limitations may be made.
 9. Defects that indicate imperfect molding of concrete; or any surface defect indicating honeycomb or open texture (rock pockets) greater in size than an area equal to a square with a side dimension of 2-1/2 times the wall thickness or deeper than two times the maximum graded aggregate size; or local deficiency of cement resulting in loosely bonded concrete, the area of which exceeds, in size, the limits of area described in paragraph 8 above when the defective concrete is removed.

Repair of such defects not exceeding these limits may be made.
 10. Any of the following cracks:

- a. A crack having a width of 0.005 inch to 0.01 inch throughout a continuous length of 36 inches or more.
 - b. A crack having a width of 0.01 inch to 0.03 inch or more throughout a continuous length of 1 foot or more.
 - c. A crack greater than 0.0005 inch extending through the wall of the pipe and having a length in excess of the wall thickness.
 - d. Any crack showing two visible lines of separation for a continuous length of 2 feet or more, or an interrupted length of 3 feet or more anywhere in evidence, both inside and outside.
 - e. Cracks anywhere greater than 0.03 inch in width.
- F. Pipe shall have minimum laying length of approximately 8 feet except for closure and other special pieces as approved by the ENGINEER. The CONTRACTOR shall have available at the site of the work sufficient pipe for various lengths to affect closure at manholes or structures that cannot be relocated to accommodate standard lengths. Short lengths of pipe made for closure, etc., may be used in the pipeline at the end of construction if properly spaced. The length of the incoming and outgoing concrete pipe at each structure shall not exceed 4 feet, except where the joint is cast flush with the exterior wall of the structure. Maximum laying length shall not exceed 16 feet, but the installation of 16 foot lengths will depend upon the ability of the CONTRACTOR to handle such lengths of pipe in deep sheeted trenches, comply with trench width requirements, maintain the integrity of the sheeting and avoid disturbance to adjacent ground. If in the opinion of the ENGINEER the use of 16 foot lengths is impracticable, shorter lengths shall be used.
- G. Fittings and Bends
1. The manufacturer shall submit the proposed method of fabrication of bends and special pieces to the ENGINEER for approval. All such fittings shall conform to all applicable requirements of this Specification.
 2. Pipe for use on curved sections shall be fabricated by beveling one or both ends sufficient to produce the radius of curvature required. Joint deflection shall not be utilized to produce the radius of curvature required. Reinforced concrete bends shall be cast to the degree of curvature required or fabricated by cutting the pipe at the required angle and then rejoining the sections.
 3. Steel wall fittings to be used in the walls of the cast-in-place structures shall be equal to those manufactured by Interpace Corp., and shall be compatible with rubber and steel joints of reinforced concrete pipe and pre-stressed concrete cylinder pipe where applicable.
- H. Joints for Concrete Pipe

1. Joints for concrete pipe shall be the tongue and groove or bell and spigot type of joint with provisions for using a round rubber “O-ring” gasket in a recess in the spigot end of the pipe. The bevel on the bell of the pipe shall be between 1-1/2 degrees and 2-1/2 degrees and the annular open space at the gasket when the joint is made up and pipes are centered and in line shall not exceed 3/16 inches. The faces of pipe in contact with the gasket shall be true, and free of irregularities.
2. The round rubber “O-ring” gaskets shall conform to ASTM C 443 latest revision Specifications for Joints for Circular Concrete Sewer and Culver Pipe using Rubber Gaskets. Two gaskets and a manufacturer’s test report shall be submitted to the ENGINEER for tests at least 30 days before the CONTRACTOR is to joint any of the pipe. Manufacturer’s test report shall state that specimens of the gaskets where subjected to tensile tests of approximately 100 psi before and after immersion and heating tests, and they showed an elongation of at least 25 percent. Upon release from the tensile tests, it shall be noted in each specimen shall return to its original length.
3. The gaskets shall be designed and manufactured so that the completed joints will withstand an internal water pressure in excess of 20 psi for a period of 10 minutes without showing any leakage by the gasket or displacement of it, see ASTM C 443-latest revision. The pipe manufacturer shall provide facilities for testing the effectiveness of the joints against leakage and one such test may be required for each 500 feet of pipe for an internal or external pressure against the joint of at least 20 psi for a period of 10 minutes.

2.02 DUCTILE IRON PIPE

A. General

1. Ductile iron pipe shall be centrifugally cast of ductile iron conforming to ASTM Specifications A 746 latest revision. The pipe design conditions shall be as follows:
 - a. Pressure: Minimum of 250 psi operating plus 100 psi surge allowance.
 - b. Trench Loading: Laying condition Type 4 unless otherwise specified on Drawings. Trench depth not less than 2’ nor more than that shown on the Drawings.
 - c. Metal Design Strengths:

Bursting Tensile	40,000 psi
Modulus of Rupture	90,000 psi
2. The manufacturing tolerances included in the nominal thickness shall not be less than specified by ANSI/AWWA C150/A21.50, latest revision.

3. Minimum wall thickness shall be 0.33 inches (Class 52), or more if required for minimum operating pressure of 250 psi.
4. Pipe may be furnished in 18', or 20' nominal laying lengths; and the weight of any single pipe shall not be less than the tabulated weight by more than 5 percent for pipe 12" or smaller in diameter, nor by more than 4 percent for pipe larger than 12" in diameter.
5. The hydrostatic and acceptance tests for the physical characteristics of the pipe shall be as specified in ANSI/AWWA C151/A21.51, latest revision.
6. Any pipe not meeting the ANSI/AWWA specifications quotes above shall be rejected in accordance with the procedure outlined in the particular specification.
7. The ENGINEER shall be provided with 3 copies of a certification by the manufacturer that the pipe supplied for this Contract has been tested in accordance with the referenced specifications and is in compliance therewith.
8. The net weight, class or nominal thickness and sampling period shall be marked on each pipe. The pipe shall also be marked to show that it is ductile iron.
9. Unless otherwise noted, joints for ductile iron pipe will be "push-on" type consisting of a rubber gasket installed in a recess in the bell.
10. Ductile iron pipe must be used within 200 feet of underground petroleum storage tanks and shall have gaskets designed for this purpose such as Nitrile Butadiene (NBR), approved equal or better.

B. Lining and Coating Ductile Iron Pipe

1. All buried ductile iron pipe shall have manufacturer's outside coal tar or asphaltic base coating and a cement lining and bituminous seal coat on the inside. Cement mortar lining and bituminous seal coat inside shall conform to ANSI/AWWA C104/A21.4 latest revision.

C. Fittings for Ductile Iron Pipe-3" and larger

1. Ductile Iron fittings only shall be used with the ductile iron pipe.
2. Mechanical joint fittings shall be used with underground pipe.
3. Rubber-gasket joints shall conform to ANSI/AWWA C111/A21.11 latest revision for centrifugally cast ductile iron water pipe.
4. All Working Pressures - Fittings shall conform to ANSI/AWWA Specifications C110/A21.10 latest revision for 250 psi water working

pressure plus water hammer. Ductile iron fittings shall be ductile cast iron per ASTM Specifications A536, latest revision.

5. All fittings shall be cement lined and bituminous coated per Federal Specifications WW-P-421b.

D. Ductile Iron Pipe and Fittings - Smaller than 3"

1. Small size ductile iron pipe shall conform to ANSI Specifications A21.12 (AWWA C 112) latest revision. Fittings shall conform to ANSI Specifications A21.10 (AWWA C 110) latest revision.
2. Pipe may be furnished with either mechanical joints or slip-on joints. Buried fittings shall be furnished with mechanical joints.

E. Flanged Cast Iron Pipe and Flanged Coupling Adapters for Flexible Couplings

1. Non-buried ductile iron pipe and fittings shall be flanged unless otherwise specified.
2. Flanged cast iron pipe and fittings shall have dimensions facing and drilling for ANSI Class 125 flanges (125 psi steam working pressure; 250 psi water working pressure).
3. Where flanges are pit cast integrally with pipe in vertical position in dry sand molds, flanged pipe shall be AWWA Class "B" or latest revision of ANSI Specifications A21.2, Class 50 pipe for sewage, sludge, gas and air service and Class 150 pipe for all types of water service.
4. Where flanged pipe is made up by threading plain end, centrifugally cast pipe, screwing on specially designed long hub flanges, and refacing across both the face of the flange and the end of pipe, flange shall be per ANSI Specification B16.1 latest revision and pipe shall be Class 150 per ANSI Specification A21.6 latest revision.
5. Either of the foregoing methods of manufacture of flanged pipe will be acceptable, but when plain ends of flanged pipe are to fit into mechanical joint bells, then the outside diameter of the pipe shall be such that the joint can be made.
6. CBS (rubber and cloth both sides) gaskets 1/16" in thickness shall be used in connecting flanged piping. Nuts and bolts for use in making flanged connections shall have hexagonal heads, be of proper lengths and with U.S. standard threads. The tensile strength of steel used in the bolts shall be not less than 55,000 psi.
7. Flanged Coupling Adapters for flanged pipe shall be a mechanical joint cast to a special flanged joint using a neoprene "O-ring", in place of the usual 1/16" rubber ring gasket. The mechanical bell and special flanged joint piece shall be of high grade gray cast iron with bolt circle, bolt size and spacing conforming to ASA B16.1 Specifications latest

revision. Mechanical joint follower flange shall be of ductile or malleable iron with high strength/weight ratio design. Bolts shall be fine grained, high tensile, malleable iron with malleable iron hexagon nuts.

8. Flanged Coupling Adapters for 12" and smaller cast iron pipe shall be Smith-Blair #912; Dresser style 127; or approved equal. For pipe larger than 12", flexible couplings shall be Smith-Blair #913; Dresser style 128; or approved equal. All flexible couplings shall be furnished with anchor studs.

F. Mechanical Joint Restraints

1. Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.
2. Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.
3. Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.
4. Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.

2.03 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

- A. PVC pipe shall comply with ASTM D01784 and shall be Type 1, Grade 1, with pressure and SDR rating as shown on the drawings or indicated in the proposal form. All PVC pipe shall conform to the latest revisions of the following specifications:

ASTM D2241 (PVC plastic pipe SDR-PR and Class T)
Commercial Standard CS 256 (pressure rated type)
National Sanitation Foundation Testing Laboratories (NSF)

- B. The name of the manufacturer of the plastic pipe to be used must be found on the current listing of Plastic Materials for Potable Water Application, published by the NSF (National Sanitation Foundation), Ann Arbor, Michigan, and must meet the requirements of the Standard Specifications for Polyvinyl Chloride (PVC) Plastic Pipe, D1785, published by ASTM (American Society for Testing and Materials).
- C. Pipe lengths shall not exceed 40 feet. Wall thickness shall be in accordance with CS-256 and ASTM D-2241. Pipe ends shall be beveled to accept the gasketed coupling. Rubber gasketing shall conform to ASTM 1869.

- D. Samples of pipe, physical and chemical data sheets shall be submitted to the ENGINEER for approval and his approval shall be obtained before pipe is purchased. The pipe shall be homogenous throughout and free from cracks, holes, foreign inclusions or other defects. The pipe shall be as uniform as commercially practical in color. Pipe shall have a ring painted around spigot ends in such a manner as to allow field checking of setting depth of pipe in the socket.
- E. Pipe must be delivered to the job site by means which will adequately support it, and not subject it to undue stresses. In particular, the load shall be so supported that the bottom rows of pipe are not damaged by crushing. Pipe shall be unloaded carefully and strung or stored as close to the final point of placement as is practical.
- F. The couplings and fittings shall be furnished by the pipe manufacturer and shall accommodate the pipe for which they are to be used. They shall have a minimum pressure rating of 200 psi. Insertion depth of the pipe in the coupling shall be controlled by an internal PVC mechanical stop in the coupling which will allow for a thermal expansion and contraction. Couplings method shall allow for half of each end of the pipe. Couplings shall permit 5 degree deflection (2-1/2 degrees each side) of the pipe without any evidence of infiltration, cracking or breaking. Couplings shall have rubber seals factory installed.
- G. Pipe markings shall include the following, marked continuously down the length:
 - Manufacturer's Name
 - Nominal Size
 - Class Pressure Rating
 - PVC 1120
 - NSF Logo, and
 - Identification Code
- H. Lubricant shall be water soluble, nontoxic, be non-objectionable in taste and odor imparted to the fluid, be non-supporting of bacteria growth and have no deteriorating effect on the PVC or rubber gaskets.

2.04 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS (SCHEDULE 80)

A. General

Schedule 80 PVC pipe shall be as manufactured by the Celanese Piping Systems, Inc., or approved equal. To ensure installation uniformity, all piping system components shall be the products of one manufacturer.

B. Materials

1. Pipe and fittings shall be manufactured from a PVC compound which meets the requirements of Type 1, Grade 1 polyvinyl chloride as outlined in ASTM D-1784. A Type 1, Grade 1 compound is

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characterized as having the highest requirements for mechanical properties and chemical resistance. Fittings shall be socket type and shall conform to the requirements of ASTM D-2467.

2. Compound from which pipe is produced shall have a design stress rating of 200 psi at 73° F., listed by the Plastics Pipe Institute (PPI).
3. Materials from which pipe and fittings are manufactured shall have been tested and approved for conveying potable water by the National Sanitation Foundation (NSF).

C. Solvent Cement

All socket type connections shall be joined with PVC solvent cement complying to ASTM D-2564. Cement shall have a minimum viscosity of 2000 cps.

D. Installation

Installation shall be in strict accordance with the manufacturer's printed instructions. Printed installation instructions shall be submitted and approved by the ENGINEER prior to shipment of the pipe.

E. Testing

1. Pressure Pipe - Refer to Paragraph 3.02 of this Division.
2. Vacuum Pipe - All pipe intended for use under partial vacuum shall be tested by subjection to 24 inches of mercury vacuum; allowing 15 minutes to stabilize and thereafter lose not more than 1% vacuum pressure per hour over a minimum 4 hour test period. This test must be met or exceed prior to final acceptance.

2.05 HIGH DENSITY POLYETHYLENE PIPE

A. General

1. High density polyethylene pipe shall be Adyl "D" polyethylene pipe manufactured by E.I. DuPont DeNemours and Co., Inc., or "Driscopipe" as manufactured by Phillips Product Co., Inc., or approved equal.

B. Materials for Polyethylene Pipe

1. The polyethylene pipe and fittings shall be made of polyethylene resins classified in ASTM D 1248 as Type III, Category 5, Grade P34 (pipe designation PE 3408 defined per ASTM D 3035 latest revision), having specific base resin densities of 0.942 g/cc minimum and 0.955 g/cc maximum, respectively; and having melt indexes of 0.4 g/10 min. maximum and 0.15 g/0.10 min. minimum, respectively.

2. Pipe made from these resins must have a long-term strength rating of 1,600 psi or more.
3. The polyethylene resin shall contain antioxidants and shall be stabilized with carbon black against ultra-violet degradation to provide protection during processing and subsequent weather exposure.
4. The polyethylene resin compound shall have a resistance to environmental stress cracking as determined by the procedure detailed in ASTM D 16930 latest revision, Condition B with sample preparation by procedure C of not less than 200 hours.

C. Polyethylene Pipe and Fittings

1. Polyethylene pipe furnished and installed under this Contract shall be of nominal outside diameter shown on the Drawings, and shall be designed for a normal internal working pressure and earth cover over top of the pipe to suit the conditions of proposed use.
2. Each length of pipe shall be marked, at no more than 10 foot intervals, with the following information:

Nominal pipe size
Type plastic material - PE3408
Pipe pressure rating
Manufacturer's name, trademark and code

3. All pipe shall be made from virgin material. No rework compound.
4. Pipe shall be homogenous throughout, and be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.
5. Fittings for the polyethylene pipe line shall be molded for fabricated from the same material as specified hereinbefore for the high density polyethylene pipe.
6. Fittings for bends 22-1/2 degrees or greater shall be provided as shown on the Drawings. For alignment changes of less than 20 degrees deflection, the pipe may be laid in curves with a radius of 80 feet or greater.
7. All run-of-the-pipe fittings shall be fusion welded into the pipe line. Tee branches shall be of the size shown on the Drawings and shall be furnished with flanged ends per ANSI B-16.1. All fittings shall be factory made.
8. Fittings shall be capable of withstanding the same pressure and loading conditions specified for the pipe.
9. Wye Branches shall be true wyes.

D. Pipe Jointing

1. Pipe to be joined by leak-proof, thermal, butt fusion joints. All fusion must be done by personnel trained by the pipe supplier using tools approved by the pipe supplier.
2. The fusion machine shall have hydraulic pressure control for fusing 2 pipe ends together; it shall include pressure fusion indicating gauges to correctly monitor fusion pressures. The machines shall be equipped with an electric or gasoline engine powered facing unit to trim irregularities from the pipe ends.
The heating plate on the fusion machine shall be electrically heated and thermostatically controlled and shall contain a temperature gauge for monitoring temperature.
3. Joint strength must be equal to that of adjacent pipe as demonstrated by tensile test. In addition, results of tensile impact testing of joint should indicate a ductile rather than a brittle fracture. External appearance of fusion bead should be smooth without significant juncture groove.
4. Threaded or solvent cement joints and connections are not permitted.

E. Joining, Terminating or Adapting by Mechanical Means

1. The polyethylene pipe shall be connected to systems or fittings of other materials by means of an assembly consisting of a polyethylene flange adapter butt-fused to the pipe, a backup ring of either cast iron, steel, or high silica aluminum alloy made to ANSI B-16.1 dimensional standards (with modified pressure ratings), bolts of compatible material (insulated from the fittings where necessary) and a gasket of reinforced black rubber, asbestos-rubber compound or other material approved by the ENGINEER, cut to fit the joint. In all cases, the bolts shall be drawn up evenly and in line.
2. Termination of valves, or fittings such as tees, bonds, etc., made of other materials shall be by the flange assemblies specified hereinbefore. The pipe adjacent to these joints and to joints themselves must be rigidly supported for a distance of one pipe diameter or 1 foot, whichever is greater, beyond the flange assembly.

F. Tools and Procedures

1. Fusion jointing and other procedures necessary for correct assembly of the polyethylene pipe and fittings will be done only by personnel trained in those skills by the pipe supplier.
2. Only those tools designed for aforementioned procedures and approved by the pipe supplier shall be used for assembly of pipe and fittings to ensure proper installation.

2.06 COPPER PIPE AND FITTINGS

- A. Exterior copper pipe shall be Type K pipe (ASTM B88 latest revision), with compression fittings. Joints shall be drawn up firmly and shall be tested before backfilling and any leakage stopped.
- B. Wherever copper pipes pass through walls or floors, they shall have wrought or cast iron sleeves, for easy removal. Pipes passing through structural beams shall be placed as near as possible to the top of the beam under the floor slab.

2.07 PRE-STRESSED CONCRETE PRESSURE PIPE, AWWA C-301 LATEST REVISION

A. General

- 1. Pre-stressed concrete pressure pipe shall be of the pre-stressed steel cylinder type, conforming to AWWA C301, latest revision. This standard covers two types of pre-stressed pipe: (a) pipe with steel cylinder lined with a concrete core (lined cylinder pipe, 16" - 48"), and (b) pipe with a steel cylinder embedded in a concrete core (embedded cylinder pipe, 54" - 192").
- 2. All concrete pipe supplied for this project shall have internal cores placed as specified in either paragraph 3.6.9 (centrifugal method of 16" - 48" LCP) or paragraph 3.6.10 (vertical method for 54" - 192" ECP) of AWWA C301. Concrete pipe manufactured using other methods of core placement will not be approved.
- 3. The pipe shall be made by a manufacturer experienced in producing pipe of the type and size specified herein.

B. Design

- 1. The pipe shall be designed to withstand, with bedding and backfill as detailed in these documents (Drawings and Specifications), the indicated design pressure and the maximum trench loading which will be applied after the backfill is in place, plus an allowance of 50% for water hammer.
- 2. The laying condition for the pipeline shall be as is indicated on the Contract Drawings. Unless otherwise indicated, the live load shall be computed according to AASHTO H-20 for one truck including AASHTO recommended impact factors. The resulting design live loading is to be reduced by the load factors shown for the laying condition specified, to achieve the equivalent 3-edge bearing load.

C. Shop Drawings and Markings on Pipeline Materials

- 1. The CONTRACTOR shall furnish to the ENGINEER for his review sepia copies of the shop drawings, design calculations and complete

laying schedule, prior to the manufacture of any materials. Pipe, fittings and specials shall not be made until the ENGINEER has reviewed these drawings.

2. The laying schedule shall be followed, in detail, during installation of the pipeline and appurtenances. The pipe and fitting identification shown on the schedule shall coincide with markings on the pipe and fittings.

D. Fittings and Specials

1. The drawings show the location of outlets, connections and appurtenances to be installed along the pipeline. The pipe manufacturer shall furnish all fittings and special pieces required for closures, curves, bends, and branches, together with connections or adapters for air valves, blow-offs, main line valves, and other pipe connections where shown on the Drawings.
2. The fittings and specials shall conform to the requirements of AWWA C301 Type "B" and shall be furnished and installed as shown on the Drawings or as required.
3. Bevel pipe may be used where the required deflection of the pipeline is more than is allowed by the joint opening method in straight pipe, yet less than that required for an elbow or special fitting. The difference in length of opposite sides (Laying length) shall be no more than one inch per foot of internal diameter of the pipe.

E. Material

1. Pre-stressing wire shall conform to ASTM A648 and will be 6 gauge minimum thickness and Class III.

F. Joints

1. Joints for pipe and fittings shall be of steel ring, bell and spigot, rubber gasket type and shall conform to AWWA C301, latest revision. Exposed portions of the joint rings shall be protected by a zinc metalized coating, having a minimum thickness of 0.004 inch.
2. Where required by the Contact Drawings, the CONTRACTOR shall furnish and install restrained joints designed to meet the same specifications as the pipe. Restrained joints for concrete pressure pipe shall be "Snap Ring" or "Harness Clamp" as manufactured by Price Brothers Company and/or GHA-Lock Joint. If requested, the CONTRACTOR shall also furnish calculations supporting the restrained joint design, all at no additional cost to the OWNER.

G. Testing and Certifications

1. The manufacturer of the pipe shall furnish to the ENGINEER five copies of certified reports containing the results of control test of cement, concrete (standard test cylinders), steel sheet, pre-stressing wire and hydrostatic test on all steel cylinders (except plain end pieces).
2. Each steel cylinder, with joint ring welded to its ends, shall be subjected to a hydrostatic test which stresses the steel to a unit stress of at least 20,000 psi, but not greater than 25,000 psi and all welds shall be inspected for soundness and water-tightness.
3. The test shall comply with AWWA C301 in all respects and the pipe manufacturer shall submit an affidavit of compliance to the OWNER stating that the pipe and fittings have been designed, manufactured and tested according to Specifications.
4. The OWNER reserves the right to witness the testing of materials by the pipe manufacturer or have same performed by an independent testing service. The manufacturer shall make all laboratory facilities available to the OWNER and shall notify the ENGINEER at least 24 hours in advance of start of production of the pipeline materials for the project.

2.08 HIGH STRENGTH TRACER WIRE & LOCATOR

A. Conductor for High Strength Tracer Wire

1. Material Description: Copperweld® Copper-clad steel wire or approved equal composed of a steel core with a uniform and continuous copper cladding thoroughly bonded to the steel throughout. Wire must conform with ASTM B910/B910M.
 - i. Cladding: The steel and copper interface must have a metallurgical bond achieved through a high heat and pressure bonding process. Established process for porosity-free material
 - ii. Steel: High Strength with 0.54 carbon or greater. Verified to meet required mechanical properties.
 - iii. Copper: UNS-C10200; of Copper according to ASTM B-170 (latest revision). High conductivity, oxygen free copper to achieve optimal signal performance.
2. Surface Condition: Wire surface shall be free of any defects, including flakes, grooves, pits, and voids. Wire surface shall be smooth, bright and shiny and free of excessive copper dust and residual drawing lubricants.
3. Physical, Mechanical, & Electrical Properties
The wire shall conform to the properties listed in Table below:

#10 CCS 1055 Soft Drawn 21% Conductivity	CCS Conductor
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Size (AWG)	10 AWG
Conductor Type	Copper Clad Steel (CCS)
Temper	Dead Soft Annealed (DSA)
Average Break Load	600 lbs.
Minimum Tensile Strength	67,000 psi
Minimum Elongation	15.0%
Copper Thickness (% of Diameter)	3.0%
Minimum Copper Weight	13%
Nominal DC Resistance (ohms/1000 ft)	4.7564

B. Insulating Jacket for High Strength Tracer Wire

1. Material Description: Insulating jacket is comprised of a co-polymer high molecular weight natural high density polyethylene (HDPE) designed specifically for high-speed copper wire insulating. It contains the required levels and types of primary antioxidant and metal deactivator additives to satisfy most Wire and Cable industry requirements. HDPE material will be produced with an excellent balance of surface smoothness, processing ease, tensile and elongation properties, abrasion toughness, environmental stress crack, thermal stress crack resistance, and electrical consistency.

2. Physical, Mechanical & Electrical Properties
The wire shall conform to the properties listed in Table below:

High Density Polyethylene Insulator	Value
Density (ASTM D 792)	0.943 g/cc
Bulk Density (ASTM D 1895)	0.58 g/cc
Melt Index (ASTM D 1238/E)	0.70 dg/min
Tensile-Yield (ASTM D 638)	4300 psi
Tensile-Ultimate (ASTM D 638)	2900 psi
Tensile-Elongation (ASTM D 638)	850%
Flexural Modulus (ASTM D 790/1)	120,000 psi
Hardness (ASTM D 2240)	63 Shore D
Environmental Stress-Crack (ASTM D 1693/B)	F ₂₀ > 48 h
Thermal Stress-Crack (ASTM D 2951)	F ₀ > 1000 h
Brittleness Temperature (ASTM D 746)	< -95° F
Melting Point (DSC) (ASTM D 3417)	262° F
Softening Point (Vicat) (ASTM D 1525)	250° F
Oxidative Induction Time (ASTM D 3895)	>50 min. @ 200° C
Dielectric Constant (ASTM D 1531)	2.34 @ 1 MHz
Dissipation Factor (ASTM 1531)	0.00007 @ 1 MHz
Volume Resistivity (ASTM D 257)	5 x 10 ¹⁷ ohm-cm
Dielectric Strength (ASTM D 3755)	1000 volts @ 20 mils

C. Locator

1. Locator shall include a complete "locator" meaning receiver, transmitter, direct-connect cables, grounding rods, and hard

cover carrying case as manufactured by HETEK Solutions, Inc. or approved equal.

2. Receiver shall have the ability to receive the following frequencies 8.1 kHz, 81 kHz, &/or 480 kHz. Receiver shall have continuous depth readings, right/left guidance and automatic gain. Display of Receiver shall be a backlit LCD display with battery status indicator. Sure-Lock as manufactured by HETEK Solutions, Inc. or APPROVED EQUAL. Receiver shall be powered by AA batteries with operation conditions -25 to 150° F and be enclosed in a weather-resistant housing.
3. Transmitter shall have the ability to transmit multiple frequencies simultaneously or a single frequency, frequencies utilized 8.1 kHz, 81 kHz, &/or 480 kHz, variable power outputs, rechargeable batteries with approximate battery life of 30 hours and have operating conditions of -25 to 150° F.

D. Above Ground Markers

1. Above Ground Markers shall be made of a plastic blend that will withstand fading in the sun. Marker shall be installed above the force main at location dictated by termination of tracer wire (approximately every 500 LF). Marker shall be a three sided marking post with each face being 3-1/2" wide.
2. Marker shall have a decal placed on all three sides. Decals and marker color must be specific to their intended use per APWA Uniform Color Code. Decals shall be fade resistant and remain legible after a minimum of 2,000 hours in a QUV Weatherometer. Decal graphics shall include the international 811 Dig symbol.

Red – Electric	Orange - Communication
Yellow – Gas	Blue – Potable Water
Green – Sewer	Purple – Reclaimed water

3. The marker shall be capable of withstanding a minimum of 10 vehicle impacts at 55 M.P.H. with a car bumper.
4. Markers shall have an internal tracer wire terminals with specifically designed end caps of same color as the main body of marker.
5. Marker shall be Rhino Triview Test Stations, or approved equal.

E. At-Grade Tracer Boxes

Specifications apply to materials, design and performance requirements for plastic tracer boxes, herein referred to as box(es), which provide access to underground service and mainline corrosion or locator/tracer wire systems.

1. Material Requirements

- i. Materials used to construct products in above specifies scope shall be non-corrosive or corrosion resistant.
- ii. Tube material shall be of high grade ABS, or equivalent rigid plastic that meets or exceeds ASTM D-1788, Type 1 requirements.
- iii. Lid material shall be of cast iron or ductile iron. Tensile strength or ductility of such material shall be equal or superior to hi-tensile cast iron ASTM A-126-B requirements.
- iv. Lid-locking bolt material shall be made of aluminum material equal or superior to ASTM B-253.
- v. Lid-locking mechanism material shall be made of plastic to meet or exceed ASTM A-126-B requirements.

2. MATERIAL REQUIREMENTS:

- i. Materials used to construct products in above specifies scope shall be non-corrosive or corrosion resistant.
- ii. Tube material shall be of high grade ABS, or equivalent rigid plastic that meets or exceeds ASTM D-1788, Type 1 requirements.
- iii. Lid material shall be of cast iron or ductile iron. Tensile strength or ductility of such material shall be equal or superior to hi-tensile cast iron ASTM A-126-B requirements.
- iv. Lid-locking bolt material shall be made of aluminum material equal or superior to ASTM B-253.
- v. Lid-locking mechanism material shall be made of plastic to meet or exceed ASTM A-126-B requirements.

3. DESIGN REQUIREMENTS:

i. Detection

1. Box shall be designed to be easily detected by magnetic and electronic locators even when box is covered by a minimum of four (4) inches of soil, sod and / or paving material.
2. A magnet shall be securely attached at the top of the upper tube of the box for locating purposes. Material used to retain magnet in place shall remain effective at minus 15 degrees Fahrenheit. **NOTE: A MAGNETIZED LID OR MAGNET ATTACHED TO THE LID IS NOT ACCEPTABLE.**

ii. Security

1. Locking Mechanism

- a. Lid of valve box shall be designed to employ a locking mechanism that will clamp it to the box collar in a closed position.
- b. Locking mechanism shall incorporate a standard pentagon-shaped head bolt which when measured from flat to vertex shall not be less than 0.830 inches or greater than 0.875 inches.
- c. Locking mechanism shall be such that the lid cannot be removed without using the proper wrench.
Collar.
- d. Collar is designed for support of the lid and shall be securely attached to the upper tube to prevent separation after installation.
- e. Collar shall be designed to withstand an applied impact force of two (2) foot pounds without failure at -15 degrees Fahrenheit.

2. Shape

- a. Box shall be of a tubular construction (cylindrical) with removable round lid.
- b. Box shall have a support flange at the base of the lower tube bell at least one-half (1/2) inch wide. If box is designed for use with an integral valve support, flange may be omitted.

3. Length Adjustment

- a. Box shall have be of telescoping design with upper and lower tubes overlapping three (3) inches when the box is extended to its maximum overall length.
- b. Box of sliding design shall be made to maintain tension in the range of 40-80 pounds at any length between minimum and maximum lengths.
- c. Tension system shall be designed to allow upper portion of lower tube to be sawed off without loss of tension.

- d. Tension requirements must be met after box has been removed from storage and telescoped ten (10) times.
4. Wire connection
 - a. Brass screw running through brass wire harness will be used as connection for locator transmitter hook-up.
 - b. Brass wire harness shall be used to secure tracer wire leads to brass screw enabling locator equipment hook-up.
 - c. Petrolatum wax tape incorporated with magnetized tracer box to encapsulate tracer wire leads and brass wire harness.
 - i. Petrolatum wax tape must be formed around brass wire harness connection after tracer wire leads are connected to prevent oxidation of wire ends.
 - ii. In order to ensure proper long term locatability and signal strength, the petrolatum wax tape must be utilized to prevent oxidation.
 5. Access Box shall be designed for operational access to underground tracer wire systems.
 6. Lid
 - a. Box shall be designed so that when installed, the collar will be flush with the surface and contain the lid so that it will not be in contact with the adjoining backfill or pavement.
 - b. The cavity which holds the lid shall be designed so that water drains into the inside of the box.
 - c. The top surface of the box lid shall be flush with the top of the box. The top of the bolt or locking device when in the locked position shall be flush with or below the lid surface.

PART 3 EXECUTION

3.01 LAYING PIPE IN COMMON TRENCH

02610-20

- A. Pipelines, force mains and sewers laid in same trench shall, in all cases, be laid on original earth, regardless of divergence in their elevations. Pipe shall never be laid in backfill or one above the other. The CONTRACTOR shall include payment for all trenching and backfilling in his lump sum bid.

3.02 PRESSURE PIPE INSTALLATION - GENERAL

A. General

1. Pipe shall be handled with such care as necessary to prevent damage during installation. The interior of the pipe shall be kept clean and the pipe shall be installed to the lines and grades shown on the Drawings. Pipe shall be installed according to instructions and with tools recommended by the manufacturer. Whenever pipe laying is stopped, the end of the pipe shall be securely plugged or capped.
2. Ductile Iron fittings only shall be used with the PVC pipe.
3. Mechanical joint fittings shall be used with underground pipe.
4. Fittings less than 4-inches in diameter shall be of the mechanical joint type and be firmly blocked to original earth or rock to prevent water pressure from springing pipe sideward or upward. Concrete or other blocking material approved by the ENGINEER shall be placed such that it does not cover the pipe joints, nuts, and bolts.
5. Fittings 4-inches in diameter and greater shall be of the mechanical joint type and firmly restrained to prevent water pressure from springing pipe sideward or upward. The mechanical restraint shall be the Series 2000PV produced by EBAA Iron, Inc. or approved equal.
6. Pipes shall be free of all structures other than those planned. Openings and joints to concrete walls shall be constructed as shown on the Drawings.
7. Ductile iron or steel pressure pipe, 4 inch diameter or larger, entering a structure below original earth level, unsupported by original earth for a distance of more than 6 feet shall be supported by Class "2500" concrete, where depth of such support does not exceed 3 feet, and by Class "4000" concrete piers each 6 feet, where depth exceeds 3 feet. All other pressure pipe entering buildings or basins below original earth and having a cover of more than 24 inches of earth, or under roadway, shall be supported as shown in detail on the Drawings. All piers required will be paid for in accordance with the appropriate specification hereinbefore. Class "2500" concrete required will be included in the payment for furnishing and laying the particular pipe, in order to discourage excessive excavation outside the limits of structures. Pipes entering structures shall have flexible joint within 18 inches of exterior of structure, and also from point of leaving concrete support to original earth or crushed stone bedding.

B. Pressure Pipe Laying

1. Pressure pipe shall first be thoroughly cleaned at joints, then joined according to instructions and with tools recommended by the manufacturer. A copy of such instructions shall be available at all times at the site of the work.
2. All pipes must be forced and held together, or “homed” at the joints, before sealing ground level and unsupported by original earth for a distance of more than 6 feet shall be supported by concrete to original ground where depth of such support does not exceed 3 feet. When depth exceeds 3 feet, beams with piers shall be used for support.
3. Trench excavation for pipe laying must be of sufficient width to allow the proper jointing and alignment of the pipe. Trenches in earth or rock shall be dug deep enough to ensure 30” minimum cover over top of the pipe, unless otherwise indicated on the Drawings.
4. Trench line stations shall be set ahead of the trenching at least each 100 feet of pipeline. Trenches shall be dug true to alignment of stakes. Alignment of trenches or pipes in trench must not be changed to pass around obstacles such as poles, fences and other evident obstructions without the approval of the ENGINEER. Lines will be laid out to avoid obstacles as far as possible, consistent with maintenance of alignment necessary to finding the pipeline in the future and avoiding obstruction of future utilities and structures.
5. Cut pieces of pressure pipe 18” or more in length may be used in fitting to the specials and valves and fitting changes in grade and alignment. Cut ends shall be even enough to make first class joints.

C. Testing Pressure Pipe

1. Pressure and leakage tests shall be conducted in accordance with ANSI/AWWA C600.
2. The CONTRACTOR shall furnish all necessary equipment for pressure testing.
3. Inspection of pipe laying shall in no way relieve the CONTRACTOR of the responsibility for passing tests, stopping leakage, or correcting poor workmanship.
4. Underground pipelines will not be finally accepted until leakage is less than allowable by ANSI/AWWA C600. In case leakage exceeds this amount, the CONTRACTOR shall locate and repair leaks until the entire pipeline will pass the required test. All leakage shall be stopped in exposed piping. The pumping equipment shall be disconnected during test.

5. The CONTRACTOR shall furnish meter or suction tank, pipe test plugs and bypassing piping and make all connections for conducting the above tests. The pumping equipment used shall be compressed air, centrifugal pump or other pumping equipment which will not place shock pressures on the pipeline. Power plunger pumps will not be permitted or us on closed pipe system for any purpose.

3.03 DUCTILE IRON PIPE INSTALLATION

- A. Pipe shall be handled with such care as necessary to prevent damage during installation. The interior of the pipe shall be kept clean and the pipe shall be laid to the lines and grades shown on the Drawings and/or as established by the ENGINEER.
- B. Whenever pipe laying is stopped, the end of the pipe shall be securely plugged or capped. Care should be taken to prevent flotation of pipe in the event the trench should flood.
- C. Fitting shall be firmly blocked to original earth or rock to prevent water pressure from springing pipe sideward or upward. Concrete or other blocking material shall be placed such that it does not cover the pipe joints, nuts and bolts.
- D. Pipes shall be free of all structures other than those planned. Openings and joints to concrete walls shall be constructed as shown on the Drawings. Any cast iron pipe entering a structure below original ground level and unsupported by original earth for a distance of more than 6 feet shall be supported by concrete to original ground where depth of such support does not exceed 3 feet. When depth exceeds 3 feet, beams with piers shall be used for support.
- E. All pipes entering buildings or basins below original earth level, which have less than 6 feet span between wall and original earth and having a cover of more than 24 inches of earth, or under roadway, must be adequately supported as approved by the ENGINEER or shown on the Drawings. All such supports are to be included in the contract price and no extra payment will be made for same.
- F. Pipes entering structures shall have a flexible joint within 18" of exterior of structure, or from point of leaving concrete support to original earth or rock bedding.
- G. Cast iron pipe shall be thoroughly cleaned at joints, then joined according to instructions and with tools recommended by the manufacturer.
- H. All pipes must be forced and held together, or "homed" at the joints, before sealing or bolting. Pipe must be aligned as each joint is placed, so as to obtain straight lines and grades. Curves and changes in grades shall be laid in such a manner that maximum allowable joint deflection is not exceeded.

- I. Cut pieces of cast iron pipe 18" or more in length, may be used in connecting valves and fittings and for changes in grade and alignment. Cut ends shall be even enough to make first class joints.
- J. Sufficient excavation for bell holes will be required for tightening of bolts. No pipe shall be laid resting on rock, blocking, or other unyielding objects except where laid above ground on piers or in permanent tunnels.

3.04 CONCRETE PIPE INSTALLATION

- A. Bedding shall be placed and compacted to give complete vertical and lateral support for the lower section of the pipe as indicated on the Drawings. A depression shall be left in the supporting material at the joint to prevent contamination of the rubber gasket immediately before being forced home. Before the pipe is lowered into the trench, the spigot and bell must be cleaned and free from dirt. Gasket and bell shall be lubricated by a vegetable lubricant which is not soluble in water, furnished by the pipe manufacturer, and harmless to the rubber gasket. The pipe shall be properly aligned in the trench to lessen the possibility of fouling the gasket. As soon as the spigot is centered in the bell of the previously installed pipe, it shall be forced home with jacks or come-alongs. After the gasket is compressed and before the pipe is brought fully home, each gasket shall be carefully checked for proper position around the full circumference of the joint. Steel inserts shall be used to check the final position of the gasket. The jacks or come-alongs shall be anchored sufficiently back along the pipeline (a minimum of 5 lengths) so that the pulling force will not dislodge the pieces of pipe already in place. Only a jack or come-along shall be employed to force the pipe home smoothly and evenly and hold the pipe while backfilling is in progress. Under no circumstances shall crowbars alone be used nor shall any of the motor-driven equipment be used.
- B. As soon as the pipe is in place and before the come-along is released backfill shall be placed and compacted as indicated on the drawings for at least one-half the length of pipe. Not until this backfill is placed shall the come-along be released. If any motion at joints can be detected, a greater amount of backfill shall be placed before pressure is released.
- C. The CONTRACTOR shall carefully regulate his equipment and construction operations such that the loading of the pipe does not exceed the loads for which the pipe is designed and manufactured. Any pipe damaged during construction operations shall promptly and satisfactorily be repaired at the CONTRACTOR'S expense.

3.05 HIGH DENSITY POLYETHYLENE PIPE INSTALLATION

- A. General
 - 1. High density polyethylene pipe shall be installed in strict accordance with the manufacturer's recommendations and these Specifications.

2. The CONTRACTOR shall have the manufacturer furnish all necessary technical assistance, installation instruction and jointing supervision required to ensure that the pipe is properly installed. The CONTRACTOR shall furnish the services of a technical representative of the manufacturer to supervise the joining, bedding, laying and backfilling of at least the first 200 feet of pipe.
3. Upon satisfactory completion of the initial jointing, bedding, laying and backfilling of the first 300 feet of pipe, the CONTRACTOR shall furnish the ENGINEER a written statement from the manufacturer's technical representative certifying that he has witnessed the work in progress and approves the techniques being used and the results obtained by the CONTRACTOR.
4. The manufacturer's technical representative shall have had previous experience with similar work, and be fully qualified to supervise and demonstrate proper procedures for jointing and laying the high density polyethylene pipe.

B. Bedding

1. The laying condition for the high density polyethylene pipe will be on a 6" pad of loose soil with mechanically compacted earth (to a 90 percent of maximum density as determined by Standard Proctor density test) to the centerline of the pipe.
2. At the CONTRACTOR'S option, he may substitute a 6" pad of No. 8 crushed stone below the bottom of the pipe and backfill to the centerline of the pie with No. 8 crushed stone.

C. Grade and Alignment

1. Polyethylene pipe shall be laid to predetermined grades and lines as indicated by the Contract Drawings. Grade lines shall be established either by means of offset grade stakes or by direct levels.

3.06 INSTALLING FLANGED OR THREADED PIPE AND FITTINGS

- A. The CONTRACTOR shall clean off all rust and dirt and paint all threads with red lead, before assembling, and the pipe shall be installed with flanges and pipes plumb and level, showing no leakage. Unions shall be included in threaded pipe runs to allow for easy removal of pipes. All valve operating devices shall be in locations and of types shown on the Drawings. They shall be accurately plumbed, leveled, supported and braced for smooth operation. Flanged joints shall be assembled with appropriate flanges, gaskets, and bolting. The clearance between flange faces shall be such that the connections can be gasketed and bolted tight without imposing undue strain on the piping system. Flange faces shall be parallel and the bores concentric; gaskets shall be centered on the flange faces so as not to project into the bore. Bolting shall be lubricated before assembly to ensure uniform bolt stressing. The flange bolts shall be drawn up and tightened in staggered

sequence in order to prevent unequal gasket flange spacing. When a raised face is joined to a companion flange with a flat face, the raised face shall be machined down to a smooth matching surface and a full face gasket shall be used.

3.07 INSTALLATION OF AWWA C301 PRE-STRESSED CONCRETE RESSURE PIPE

- A. The interior of the pipe shall, as the work progresses, be cleaned of all dirt, jointing materials and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of the pipe shall be closed with a plug or cap (plywood used if neat fitting) fitted into each open pipe end. Precautions must be taken to prevent flotation of the pipe, should water enter the trench prior to putting the pipeline in operation.
- B. Before assembling a joint, the spigot end of the pipe shall be thoroughly cleaned. The inside of the bell end of the pipe and the gasket shall be cleaned and lubricated with lubricant as recommended by the manufacturer. The gasket shall then be placed around the spigot end so it is properly seated in the circumferential groove to maintain uniform tension in the gasket all around the pipe. The spigot end shall then be aligned with the bell end of the pipe and carefully entered into the bell.
- C. The joint shall be checked to determine if the gasket is in the proper position. The joints of pipe 24 inches or larger shall be checked from the inside of the pipe. Before the spigot is thrust completely home, steel spacers shall be inserted in the seat of the bell to leave a half-inch clearance. A feeler gauge shall then be inserted into the recess to check the position of the gasket. If the gasket cannot be felt all around the pipe, the spigot shall be removed. If the gasket is not damaged it may be reused, but both the gasket and the joint shall be relubricated. After it has been determined the gasket is in its proper position, the joint spacers shall be removed and the pipe pushed or pulled completely home. The joints of pipe smaller than 24 inches may be checked from the outside of the pipe by inserting a feeler gauge into the flare of the bell to assure that no portion of the gasket is protruding.
- D. After the joint is assembled, a cloth band is placed around the joint recess and wired or strapped in position to provide a means of pouring grout in the recess. A grout composed of one part cement and two parts sand is poured into the joint recess beneath the band. Measures should be taken to assure the entire recess around the pipe is completely filled.
- E. As an alternative to placing grout around the outside of the joint, the CONTRACTOR may install a polyurethane foam loop impregnated with cement. The installed foam loop shall be under compression around the entire circumference of the pipe. The foam loop shall be Flex-Protex, as manufactured by Alva-Tech, or approved equal. Joints located next to valves shall be grouted for three joints each direction from the valve and all restrained joints shall also be grouted only.

- F. When a change in alignment or grade is required by articulating the joint, in accordance with the manufacturer's laying schedule, then the joint shall be opened the specified amount.

3.08 PVC PIPE INSTALLATION

PVC pipe shall be installed in accordance with the manufacturer's instructions and the "General" provisions under 3.01 and 3.02 in this Section.

3.09 STERILIZATION OF POTABLE WATER PIPE

- A. Upon completion of the work and cleaning up, and prior to final acceptance, the CONTRACTOR shall sterilize all new distribution system improvements which will be in contact with drinking water, including potable water pipe and connections thereto (including pumps and pump piping).
- B. Sterilization shall be accomplished by filling the facilities with water containing at least fifty (50) parts per million available chlorine utilizing a contact time of 24 hours. A residual of at least 25 parts per million, at the end of the 24 hour contact time, is required. No portion of the new work shall be placed in service prior to sterilization. At the end of the sterilization period, all sterilized surfaces and areas shall be thoroughly flushed with treated water and drained from the system, as directed by the OWNER.
- C. CONTRACTOR shall make an allowance in his bid to cover cost of filling the new water mains. The CONTRACTOR shall be billed for all water used for the construction and testing at a rate equal to the rate that the OWNER must pay the supplier.
- D. CONTRACTOR will be responsible for notifying the Health Department to observe sterilization test and shall be responsible for all sampling, including coordination, mailing and retesting, if required.

3.10 BASIS FOR PAYMENT

Piping shall be paid for at the unit price bid or lump sum bid and shall include all work incidental to making a complete installation such as excavation, bedding, backfill, painting, testing, disinfection, cleanup, seeding, etc.

END OF SECTION

SECTION 02640

METERS, INDIVIDUAL PRESSURE REDUCING VALVES, AND SERVICE LINES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This Section describes the service meters, individual pressure reducing valves, and service lines to be provided, their materials, construction, type, and installation.
- B. All meters shown on the plan sheets shall be 5/8 inch by 3/4 inch, unless otherwise noted.
- C. All meters and appurtenances shall be compatible with the OWNERS existing Radio Read System as shown in Section 11500 of these Specifications.

PART 2 PRODUCTS

2.01 INDIVIDUAL PRESSURE REDUCING VALVES

- A. Individual pressure reducing valves shall be installed with service meters where shown on the plan sheets.
- B. Individual pressure reducing valves shall be Mueller, Model No. H-9001, or approved equal, and shall include a bronze strainer. Every regulator shall have an adjustable pressure range of 50 to 125 pounds per square inch. Upon installation, the outlet pressure shall be set at 65 pounds per square inch.
- C. Individual pressure reducing valves shall be installed on the inlet/supply side of the service meter using a tandem coppersetter. The CONTRACTOR shall ensure the meter boxes proposed for installation will accommodate the tandem coppersetter, reducing valve and service meter.
- D. The reducing valve shall not be buried or otherwise housed outside the meter box.

2.02 METERS

A. SERVICE METER ASSEMBLY

- 1. Service meters to be furnished under this Contract shall be cold water rotating disc type with hermetically sealed and magnetically driven registers. Meters shall be first-line quality of the manufacturer and be in compliance with AWWA Standard C700, or latest revisions. Any type or make of meter supplied must have been manufactured and

marketed in the U.S.A. for at least five (5) years. A bond may be submitted to waive this experience clause. The bond, if needed, shall be of an amount adequate for replacement of the meters and shall be held for five (5) years.

2. The main case shall be high grade waterworks bronze, with hinged, single lid cover and raised characters cast on them to indicate the direction of flow. Each meter must have the manufacturer's serial number stamped on the lid. Working pressure shall be not less than 150 pounds per square inch. Standard frost bottom meters with non-ferrous strainers snug against the main case shall be provided.
3. The measuring chamber shall be of corrosion-resistant thermoplastic material. The chamber shall be of the two piece design, equipped with a disc made of hard rubber and as near to the specific gravity of water as possible. Discs shall be of the three piece design of the thrust roller type.
4. The register shall be straight reading U.S. gallon type. The register unit shall be completely encased and hermetically sealed, and driven by permanent magnets. There shall be a test index circle, divided into 100 equal parts, and shall have a red center sweep test hand. Water meters shall be Badger Recordall Model 25, or approved equal. Registers shall be guaranteed by the manufacturer for a period of at least fifteen (15) years.
5. New Service Meters shall include meter box and cover, meter, coppersetter, four feet (4') of pipe and corporation stop, plus six feet (6') of pipe and adapter on the customer's side of meter. (This latter item is to prevent the customer or his plumber from disarranging or loosening the meter after the CONTRACTOR has already set the meter in its proper position.) Where the main line is in the highway right-of-way, meter shall be set as close to the right-of-way fence as practicable, but no meter on the same side of the road as the main line shall be set with more than ten feet (10') of service line unless prior approval has been obtained from the ENGINEER or his representative.
6. Meters shall be installed at each service connection unless directed otherwise by the ENGINEER. Meter boxes shall be concrete or PVC pipe twenty-four inches (24") deep. The box shall be twenty inches (20") in diameter. Meter box cover shall be eleven and one-half inches (11 1/2") diameter by four inches (4") deep, Ford No. XT-3 (Touch-Read), or approved equal. Meters shall be five-eighths inch by three-fourths inch (5/8" x 3/4"), unless shown otherwise on the plans. Meter connections shall be made by means of Ford coppersettors having a cutoff and three-fourths inch (3/4") spud. When shown on the plans (Standard Details) an angle check valve shall be furnished on the meter outlet side of the coppersetter. (The size of meter box stated is for five-eighths inch by three-fourths inch (5/8" x 3/4") meter.) For larger meters, meter box size shall be in accordance with standard

practice). Alternative boxes may be considered upon submittal of shop drawings and performance data.

7. Meters shall be set in a workmanlike manner with backfill neatly compacted in place. In yards, pastures and other grassed areas, top of meter box will be one-half inch (1/2") above grade, otherwise two inches (2") above grade.

2.03 SERVICE LINES

- A. Unless indicated otherwise on the plans, all service lines shall be three quarter inch (3/4-inch) 200 psi Polyethylene tubing. A generous loop of Polyethylene tubing shall be included with the length required for the meter setting. A corporation stop, Mueller H-15000 or approved equal, shall be used on each service line at the main line connection.
- B. Service lines crossing a county road or city street will be jacked beneath paved or black topped city streets or county roads, unless rock prevents using this method. Open cut shall be used on all unpaved city streets, county roads and private driveways. Black topped private driveways shall also be jacked under. In all cases where lines are under traffic, a minimum cover of thirty inches (30") shall be provided. All backfill shall be puddled or compacted by air tampers in layers no greater than six inches (6") in depth.
- C. Existing service meters shall be disconnected from existing water mains where indicated, and shall be reconnected to the new line. This work shall include up to thirty (30) lineal feet of matching type/diameter service line in the unit price bid for meter reconnection. Compression couplings with inserts shall be used to reconnect flexible (plastic) service line and sweat joints used for copper service line.

2.04 FREEZE-PROOF YARD HYDRANT

Outside hose bibbs shall be of brass construction with compression valve and provided with a heavy brass C.P. wing elbow for bolting to the wall. Hose bibbs shall be located generally where shown on the Drawings.

END OF SECTION

SECTION 02831

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 WORK INCLUDED

- A. This section will cover fences to be constructed at locations and in the manner shown on the plans.

PART 2 PRODUCTS

2.01 CHAIN LINK FENCING

- A. Fencing shall be of non-climbable type as manufactured by the Cyclone Fence Company, or approved equal. It shall be standard overall height of seven (7) feet and constructed of chain link fabric with three rows of barb wire on top of steel brackets. Chain link fabric shall be one foot less than complete coverall height of fence.
- B. Vehicular gates shall be of single swing type having opening of 20 feet, unless otherwise shown on the Plans.
- C. All fencing materials shall conform to applicable portions of the Standards of the Chain Link Fence Manufacturers Institute (CLFMI). Material for framework shall be open hearth, copper-bearing steel conforming to the applicable requirements of the latest ASTM for Standard Specifications, Serial Designation A7 for Steel for Bridges and Buildings.
- D. End corner, angle and pull post shall be 2-7/8 inch outside diameter, standard tubular steel weighing not less than 5.79 pounds per linear foot. Line posts shall be 2-1/4 inch structural "H" sections weighing 4.1 pounds per linear foot or 2-3/8 inch outside diameter steel pipe weighing 3.65 pounds per linear foot. Top rail shall be 1-5/8 inch outside diameter steel pipe weighing 2.27 pounds per linear foot or "H" section weighing 2.27 pounds linear foot. Top rails shall be provided with expansion rail couplings spaced at not less than 20 foot intervals. Gate posts for pedestrian gates shall be 2-7/8 inch outside diameter pipe weighing 5.79 pounds per linear foot Gate posts for vehicular gates shall be 4 inch outside diameter pipe weighing 9.1 pounds per linear foot.
- E. Braces shall be provided at all corners and wherever fabric is not continuous, such as at gates or at other openings. Braces shall be of the same material as top rail. Extension arms on intermediate posts shall be of pressed steel. Extension arms shall carry 3 barbed wires. Fittings used in connection with the fence and gates shall be malleable iron or pressed steel. Barbed wire shall be four-point pattern, two strand, No. 12-1/2 gauge, copper-bearing steel wire, heavily hot galvanized after weaving, with large barbs placed 3 inches

apart. Chain link fabric shall be copper-bearing base metal No. 9 gauge wire heavily zinc coated by hot dip process after weaving. The fabric shall be woven in a 2 inch chain-link diamond mesh. The fabric shall have a knuckled selvage along the top rail and a twisted and barbed selvage at the bottom. The barbing shall be done by cutting the wire on a bias, creating sharp points. A 2 inch padlock and chain shall be furnished with each gate. Three keys shall be furnished with each padlock. Chain shall be welded to the gate. Gate frames shall be of 1.9 inch outside diameter pipe weighing 2.72 pounds per linear foot. Corner fittings shall be of heavy malleable iron castings or pressed steel. Fabric shall be same as fence. Each gate frame shall be equipped with 3/8 inch diameter adjustable ball-and-socket hinges, catch and stops. Double gates shall have center rests. Hinges shall provide for swinging the gate open through an arc of not less than 180 degrees. Gates shall be suitably braced and reinforced to prevent sagging. Double gates shall be provided with center plunger rod, catch and semi-automatic outer catches to assure gate in opened position. All materials entering into the construction of required fencing shall be heavily galvanized by the hot dip process.

PART 3 EXECUTION

3.01 INSTALLATION

- A. End, corner and gate posts shall be set in a concrete base not less than 18 inches in diameter which shall extend at least three inches below the bottom of the post. The post shall extend to a depth of at least three feet below the surface of the ground. A brace shall be spaced midway in height of each end, corner and gate post and shall extend to the first line post. Braces shall be securely fastened to posts by means of malleable iron connections and trussed from line post back to end, corner or gate post with a 3/8 inch diameter rod.
- B. Line posts shall be set in a concrete base not less than 12 inches in diameter which shall extend at least three inches below the bottom of the post. The post shall extend to a depth of at least thirty inches below the surface of the ground. Line posts shall be equally spaced along the line of the fence at intervals not to exceed ten (10') feet.
- C. Galvanized steel pipe sleeves, 4 inch OD for corner, pull and gate posts and 3-1/2 inch OD for line posts shall be embedded in concrete as shown on the plans for all fence posts to be installed on concrete structures.
- D. Top rail shall be installed between line posts. Fabric shall not be erected until concrete has had sufficient time to cure. Chain-link fabric shall be stretched to uniform tightness on the outside of the posts with suitable tools and shall be attached with No. 6 gauge galvanized wire clips securely clinched and attached by means of adjustable clamps. Fabric shall be fastened to line posts at 14 inch intervals. Fabric shall be attached to rail at 24 inch intervals by galvanized wires.

- E. A No. 7 coil spring galvanized wire shall be stretched along the bottom of the fence and securely fastened to the posts. The chain-link fabric shall be attached to the tension wire at intervals not to exceed two feet.

END OF SECTION

SECTION 02900

LANDSCAPING

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Landscape development work in this phase is generally limited to seeding and sodding.

1.02 RELATED WORK

- A. Sub-grade elevations, excavation, filling, and grading required to establish elevations shown on Drawings are not specified in this Section. Refer to this Division, Section 02200.
- B. Erosion and sediment control are included in this Division, Section 02270.

1.03 SCOPE OF WORK

- A. Sod shall be placed on all slopes steeper than 3:1 except for dam embankment slopes. All other surfaces including dam embankment slopes shall be fertilized and seeded as specified hereinafter, except for those surfaces to be paved or rip-rapped.
- B. Fertilizing and seeding shall be performed on all disturbed areas within the limits of work of this contract which are not specified to be sodded and are not occupied by structures, road, concrete slab walls, etc. or within the impoundment area.

PART 2 PRODUCTS

2.01 QUALITY OF SOD

- A. Sod shall be well-rooted Kentucky Blue Grass sod or other approved pasture sod, completely free from noxious weeds, and reasonably free from objectionable grasses, weeds and stones or other foreign materials. The source of the sod shall be available for inspection and approval by the ENGINEER prior to stripping.
- B. Sections of sod stripped may vary in length not to exceed 8 feet but shall be of uniform width of not less than 10 inches nor more than 18 inches, and shall be cut to a depth of not less than 1 inch and not more than 2 inches. The above widths and lengths are required to ensure proper handling without undue tearing and breaking. Sod from light sand or heavy clay will not be accepted. When cut in strips, the sod shall be rolled with the grass folded

inside. The sod shall be cut by means of an approved mechanical sod cutter. During dry weather, the sod shall be watered before stripping to ensure its vitality and to prevent the loss of soil from the roots. Sod shall be rejected if permitted to decay or dry out to the extent that, in the judgment of the ENGINEER, its survival is doubtful.

2.02 PLACING SOD

- A. The sod bed shall be shaped to a smooth even surface and shall be graded such that the sod, when in place, shall be flush with any adjacent turfed area, pavement or other structures, except when otherwise directed by the ENGINEER. Prior to placing of the sod, fertilizer (10-20-10 - Ratio - 25 lbs. per one thousand square feet), Agricultural Limestone (Ratio - 75 lbs. per one thousand square feet), shall be applied, harrowed, raked or otherwise incorporated into the soil. After application of above, the sod bed, if dry, shall be moistened to the loosened depth.
- B. No sod shall be placed when the temperature is below 32°F. No frozen sod shall be placed, nor shall any sod be placed on frozen soil. Sod shall not be placed during extremely dry weather unless authorized, in writing, by the ENGINEER and provided that immediately after placing, the wood is covered with a 1 inch thickness of straw mulch.
- C. The sod shall be carefully placed by hand so that each section closely joins the adjacent sections without overlapping. All open spaces or gaps shall be plugged with sod cut to the same size and shape.
- D. The sod, after it is placed, shall be wetted thoroughly and tamped or rolled to incorporate the roots with the sod bed and to ensure tight joints between strips.
- E. All sodded areas shall be kept thoroughly moist for 2 weeks after sodding.

2.03 FERTILIZING AND SEEDING

- A. This work consists of furnishing all labor, equipment and materials and in performing all operations in connection with the fertilizing and seeding of all the finished graded areas not specified to be sodded or occupied by structures, roads, concrete slabs, sidewalks, walls, etc., and including grassed areas destroyed or damaged by the CONTRACTOR.
- B. The areas to be seeded shall be thoroughly tilled to a depth of at least 4" by deicing, harrowing, or other approved methods until the condition of the soil is acceptable to the ENGINEER. After harrowing or deicing, the seed bed shall be dragged and/or hand raked to finished grade.
- C. Fertilizer shall be 25 lbs. of 10-20-10 or equivalent per 1,000 square feet. The incorporation of the fertilizer and the agricultural lime (Ratio - 75 lbs. per one thousand square feet) may be a part of the tillage operation and shall be applied not less than 24 hours nor more than 48 hours before the seed is to be sown.

- D. The seed mixture to be sown for dry land areas shall be in the following proportions:

Common Name	Proportion By Weight	% of Purity	% of Germination
Kentucky Bluegrass	40	90	85
Chewings Fescue	25	90	85
Italian Rye Grass	20	90	85
Red Top	10	90	85
White Clover	5	95	90

The seed mixture for stream bank and wet soil areas shall be in the following proportions and applied at the noted rates:

Scientific Name	Common Name	Pure Live Seed (PLS) Ounces/Acre
<i>Andropogon gerardii</i>	Big bluestem grass	66
<i>Calamagrostis canadensis</i>	Blue joint grass	4
<i>Elymus canadensis</i>	Canada wild rye	16
<i>Panicum virgatum</i>	Switch grass	2
<i>Sorghastrum nutans</i>	Indian grass	2
		Pure Live Seed (PLS) Ounces/Acre
Scientific Name	Common Name	
<i>Spartina pectinata</i>	Prairie cord grass	6
<i>Agrostis alba</i>	Redtop	8
<i>Avena sativa</i>	Seed oats	360
<i>Lolium multiflorum</i>	Annual rye	100
<i>Phleum pratense</i>	Timothy	20
<i>Aster ericoides</i>	Heath aster	2
<i>Aster novae-angliae</i>	New England aster	1.25
<i>Baptisia leucantha</i>	White wild indigo	1.5
<i>Cassia fasciculata</i>	Partridge pea	3.5
<i>Coreopsis tripteris</i>	Tall coreopsis	1.25
<i>Desmodium illinoense</i>	Illinois tick trefoil	1
<i>Eryngium yuccifolium</i>	Rattlesnake master	3
<i>Gentiana andrewsii</i>	Bottle gentian	1
<i>Helenium autumnale</i>	Sneezeweed	1.25

<i>Helianthus grosseserratus</i>	Sawtooth sunflower	2
<i>Lespedeza capitata</i>	Round-headed bush clover	3
<i>Liatris spicata</i>	Marsh blazing star	4
<i>Monarda fistulosa</i>	Prairie bergamot	0.75
<i>Parthenium integrifolium</i>	Wild quinine	2.5
<i>Physostegia virginiana</i>	False dragon; Obedient plant	1
<i>Pycnanthemum virginianum</i>	Common mountain mint	0.5
<i>Ratibida pinnata</i>	Yellow coneflower	3.5
<i>Rudbeckia hirta</i>	Black-eyed susan	1.5
<i>Rudbeckia laciniata</i>	Wild golden glow	2
<i>Rudbeckia subtomentosa</i>	Sweet black-eyed susan	1.25
<i>Silphium integrifolium</i>	Rosin weed	2
<i>Silphium laciniatum</i>	Compass plant	3
<i>Silphium perfoliatum</i>	Cup plant	3
<i>Silphium terebinthinaceum</i>	Prairie dock	2
<i>Solidago juncea</i>	Early goldenrod	2
<i>Solidago rigida</i>	Stiff goldenrod	2
<i>Solidago rugosa</i>	Rough goldenrod	2.5
<i>Tradescantia ohioensis</i>	Common spiderwort	1.25
<i>Vernonia altissima taeniotricha</i>	Hairy tall ironweed	3
<i>Veronicastrum virginicum</i>	Culver's root	1
<i>Zizia aurea</i>	Golden alexanders	0.5

- E. All seed shall be fresh and clean and shall be delivered mixed, in unopened packages, bearing a guaranteed analysis of the seed and mixture.
- F. Seed shall be broadcast either by hand or approved sowing equipment at the rate of ninety (90) pounds per acre (two pounds per 1,000 square feet), uniformly distributed over the area. Broadcasting seed during high winds will not be permitted. The seed shall be drilled or raked into a depth of approximately 1/2 inch and the seeded area shall be lightly raked to cover the seed and rolled. Drill seeding shall be done with approved equipment with drills not more than 3 inches apart. All ridges shall be smoothed out, and all furrows and wheel tracks, shall be removed.
- G. Seed may be sown during the following periods:
 February 1 to April 15
 August 15 to October 15
- H. Seed may not be sown at any other time except with the written approval of the ENGINEER.

- I. After the seed has been sown, the areas so seeded shall be mulched with clean straw at the rate of one (1) bale per 2,000 feet (approximately 1 inch loose depth). Mulch on slopes shall be held in place with binder twine staked down at approximately 18 inch centers or by other equally acceptable means.
- J. Areas seeded shall be protected until a uniform stand develops, when it will be accepted and the CONTRACTOR relieved of further responsibility for maintenance. Displaced mulch shall be replaced or any damage to the seeded area shall be repaired promptly, both in a manner to cause minimum disturbance to the existing stand of grass. If necessary to obtain a uniform stand, the CONTRACTOR shall re-fertilize, re-seed and re-mulch as needed. Scattered bare spots up to one (1) square yard in size will be allowed up to a maximum of 10 percent of any area.

PART 3 EXECUTION

3.01 SEQUENCE OF WORK

- A. All finish grading in a general area shall be complete before sodding or fertilizing and seeding begins.

3.02 BASIS FOR PAYMENT

- A. Payment for sod or fertilizing and seeding shall be made on a unit price or a lump sum basis where a separate bid item is provided. Otherwise payment for all landscaping required for other work, such as structures, pipelines, etc., shall be made on a unit price or lump sum basis bid for that work.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 WORK INCLUDED

- A. This section includes cast-in-place concrete, formwork, reinforcing steel and related accessories in conformance with the requirements of ACI 301-latest revision, Specifications for Structural Concrete, which is hereby made a part of these Specifications except as modified by the Supplemental Requirements under PART 3. - EXECUTION, this Section.
- B. ACI 301 - latest revision is the latest consensus standard publication on concrete work and, as modified by the Supplemental Requirements in PART 3 - EXECUTION, this Section, is a complete specification. ACI 301-latest revision is part of Field Reference Manual ACI Publication SP-15 (latest revision) which includes pertinent ACI and ASTM standards considered helpful and necessary job-site reference. The Supplemental Requirements can easily be noted or clipped and taped in SP-15 (latest revision) for ready referral. The CONTRACTOR shall keep at least one copy of SP-15 (latest revision) in the field office at all times.
- C. PART 2 - PRODUCTS, this Section, includes the common concrete ingredients of cement, aggregate and water as well as admixture and grout and other concrete related items such as reinforcing steel, waterstop and joint materials. These products are also generally addressed under PART 3 - EXECUTION in ACI 301-latest revision with modifications.
- D. The work also includes furnishing all labor, materials, equipment and incidentals required to place anchor bolts, inserts, reglets, flashing, pipe sleeves, conduits and other items to be embedded or passed through the concrete as specified under other sections or as shown on the Architectural, Mechanical, Electrical and Instrumentation and Heating and Ventilating Project Drawings.
- E. Quality assurance (ACI Section 1.6). The CONTRACTOR shall employ a qualified testing agency to measure the slump, air, temperature and age of the concrete mixture delivered to the site. The CONTRACTOR'S testing agent will also make three test cylinders from each 50 cubic yards, or fraction thereof, of each concrete mixture placed in any one day.

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials,

shrinkage-resistant grout, and any others that may be requested by ENGINEER.

- B. Shop Drawings, General: All shop drawings submitted shall be a complete set of original drawings created by the Supplier. No partial or incomplete submittals nor duplication of ENGINEER original documents will be permitted.

All shop drawing submittals shall include 6 sets of prints for structural consultant to review and mark up. (Note number of prints may be increased by ENGINEER at the Preconstruction Conference.)

Shop drawings must not only bear the Contractor's stamp of approval but shall also show evidence that each item has been thoroughly checked. Failure to comply with this requirement shall result in the ENGINEER'S return of the submission (without review or action) for the Contractor's proper submission and review. No exceptions shall be taken.

The ENGINEER has set aside time to examine shop drawings one time only and to briefly reexamine a resubmission one time. Should it be required that shop drawings or product data be reviewed again, the Contractor shall reimburse the ENGINEER at the cost of 3.25 times the hourly rate of the ENGINEER'S personnel to reexamine them.

Copies of shop drawings used in the field shall bear the ENGINEER'S, review stamp with items checked to indicate a satisfactory final review.

- C. Shop Drawings; Reinforcement: Prior to fabrication, submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required and openings through concrete structures.
- D. Shop Drawings; Formwork: Submit shop drawings for fabrication and erection of specific finished concrete surfaces as indicated. Show general construction of forms including jointing, special form joint or reveals, location and pattern of form tie placement, and other items which affect exposed concrete visually.

ENGINEER'S review is for general architectural applications and features only. Design of formwork for structural stability and efficiency is Contractor's responsibility.

- E. Samples: Submit samples of materials as specified and as otherwise requested by ENGINEER, including names, sources and descriptions.
- F. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test as specified.

- G. **Materials Certificates:** Provide materials certificates in lieu of materials 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.

1.03 QUALITY ASSURANCE

- A. **Codes and Standards:** Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified.

ACI 301 "Specifications for Structural Concrete for Buildings".

ACI 304 "Recommended Practices for Measuring, Mixing, Transporting and Placing Concrete".

ACI 318 "Building Code Requirements for Reinforced Concrete".

Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

ANSI/AWS D1.4 "Structural Welding Code -- Reinforcing Steel".

ACI 117 – 90 "Standard Tolerances for Concrete Construction and Materials".

- B. **Materials and operations** shall be tested and inspected as work progresses. Failure to detect defective work shall not prevent rejection when defect is discovered, nor shall it obligate the Owner for final acceptance.
- C. **All sampling and/or testing in the field** shall be made by an ACI Concrete Field Testing Technician Grade I in accordance with ACI CP1 or equivalent.
- D. **Testing agencies** shall meet the requirements of "Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction," ASTM E 329, latest edition.
- E. **Concrete Testing Service:**

Engage a testing laboratory acceptable to ENGINEER at Contractor's expense to perform the following services:

1. **Qualification of proposed materials and the establishment of mix designs** in accordance with "Building Code Requirements for Reinforced Concrete," ACI 318, latest edition and as noted under Proportioning and Design of Mixes listed elsewhere in this section.
2. **See Section 3.19 Quality Control Testing During Construction For Required Tests.**
3. **Testing services needed or required by the Contract.**

4. Correct deficiencies in structural work which inspections have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.
- F. Materials and installed work may require testing and retesting, as directed by ENGINEER at anytime during progress of work. Allow free access to material stockpiles and facilities. Tests including retesting of rejected materials and installed work, shall be done at Contractor's expense.

G. Pre-installation Conference:

At least 14 days prior to the start of the concrete construction schedule, the Contractor shall conduct a pre-installation conference at the project site to review the proposed mix designs and to discuss the required methods and procedures to achieve the required concrete construction.

The Contractor shall require representatives of every party who is concerned with the concrete work to attend the conference, including, but not limited to, the following:

Contractor's superintendent
Material Testing Agency
Concrete subcontractor
Engineer
Construction Manager
Owner

1.04 PROJECT CONDITIONS

- A. Protection of Footings Against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against possibility of freezing; maintain cover for time period as necessary.
- B. Protect adjacent finish materials against spatter during concrete placement.

PART 2 PRODUCTS

2.01 MATERIALS

A. General

1. After award of the Contract, the CONTRACTOR shall submit in writing to the ENGINEER the name, address and qualifications of the ready-mix supplier who will furnish concrete for the project. The CONTRACTOR shall also submit the supplier and source of the sand, coarse aggregate, cement, admixtures, and the proposed mix design.

The testing laboratory selected by the CONTRACTOR and approved by the ENGINEER shall receive from the ENGINEER a copy of this Section 03300, this Division, of the Project Specifications. The CONTRACTOR shall send the required materials to the testing laboratory for mix design testing unless pre-qualified mixes are on hand that have adequate test results per ACI 301.

2. Each material submitted for tests shall be from the same single source as material proposed for the concrete work unless otherwise required or permitted.
3. Also refer to ACI 301-latest revisions and Supplemental Requirements under PART 3 - EXECUTION, this Section.

B. Cement (ACI Section 4.2.1.1.a)

1. Portland cement for concrete and mortar shall conform to ASTM C 150-latest revision, Type I.
2. The ENGINEER may require the CONTRACTOR to deliver cement to the testing laboratory for tests according to ASTM Specification C 150-latest revision for Type I. Should cement fail the tests, the CONTRACTOR shall pay for the tests and the ENGINEER shall have the right to reject the brand.
3. Cement for tests shall be delivered in four-ply paper bags with supplier and source identified in writing. Cement shall be stored in a dry location for not longer than 90 days after delivery from the mill.

C. Admixtures (ACI Section 4.2.1.4)

1. The air-entraining admixture for concrete shall conform to ASTM C 260-latest revision.
2. Water-Reducing Admixture: ASTM C 494, Type A, and contain not more than 0.1% chloride ions. Type A, Water-Reducing admixture shall be a hydroxolated polymer type admixture. Admixtures that are predominantly composed of hydroxolated carboxylic acid or lignin sulfonates are not permitted.
3. The non-chloride accelerating admixture for concrete shall conform to ASTM C494-latest revision for Type C or E (accelerating admixtures).
4. The water-reducing, set retarding admixture for concrete shall conform to ASTM C 494-latest revision for Type D, and contain not more than 0.1% chloride ions (water-reducing and retarding admixtures).
5. The high range water-reducing admixture for concrete shall conform to ASTM C 494-latest revision for Type F, and contain not more than

0.1% chloride ions (high range super plasticizer water-reducing admixtures).

6. The high range water-reducing and retarding admixture for concrete shall conform to ASTM C 494-latest revision for Type G, and contain not more than 0.1% chloride ions (high range super plasticizer water-reducing and retarding admixtures).
7. The shrinkage reducing admixture (REQUIRED for all cell structural floors, walls, beams, control area floor slab and maintenance building floor slab) for concrete shall conform to ASTM C157- latest revision (shrinkage-reducing admixtures). Available materials are as follows:
 - a. Eclipse Plus or Eclipse Floor by W. R. Grace & Co.
 - b. Approved equivalent.
8. The plastic crack control fibers in the concrete (NOT REQUIRED for this project) shall be in accordance to ASTM C1116. They shall be virgin polypropylene, 3/4" in length, colated, fibrilated, or microfilament. Dosage rate range 1/2 to 1-1/2# pounds per cubic yard of concrete. Available materials are as follows:
 - a. Grace Fibers, Microfibers, or Gilco by W. R. Grace & Co.
 - b. Approved Equivalent.
9. The temperature and shrinkage or post-crack control high volume fibers in the concrete (REQUIRED for the dumpster support slab only) shall be in accordance to ASTM C1116. They shall have a minimum tensile strength of 78ksi, minimum modulus of elasticity of 1300ksi, and a minimum length of 1.5". They shall have the ability to attain a minimum average residual flexural strength ($f'e_3$) of 150psi residual in accordance to ASTM C1018-97. Fiber dosage rate is based on $f'e_3$, $f'c$, and concrete slab thickness. Available materials are as follows:
 - a. "Strux 90/40" by W. R. Grace & Co.
 - b. Approved equivalent.
10. Corrosion resistant additive such as Xypex ADMIX C-1000 (dye) or approved equal concrete waterproofing admix (REQUIRED for floor,walls and top of the plant sump, Dwg 20-2-23) shall be added to the concrete during the batching operation to provide corrosion resistance. 3% of the required weight of Portland Cement shall be added as Xypex. The amount of cement shall remain the same and not be reduced. A colorant shall be added to verify the Xypex ADMIX was added to the concrete. Colorant shall be added at the ADMIX manufacturing facility, not at the concrete batch plant. Xypex ADMIX must be added to the concrete at the time of batching. It is

recommended that the ADMIX powder be added first to the rock and sand and blended thoroughly for 2-3 minutes before adding cement and water. The total concrete mass should be blended using standard practices to insure homogeneous mixture.

11. The admixture manufacturer shall furnish a qualified concrete technician employed by the manufacturer, to assist in the proper field batching and use the specified admixtures if requested by the Engineer. The technician shall visit the site at the beginning of concrete operations and as requested during construction. In addition, the manufacturer shall furnish the ready mix plant with accurate and dependable equipment for the proper dispensing of admixture.
 12. Substitute admixtures will be acceptable provided they meet or exceed all properties of the specified materials and specified field service is provided.
 13. The CONTRACTOR shall deliver, to the testing laboratory selected by the OWNER, 12 fluid ounces of each admixture required in the concrete design mix such as air entraining, water-reducing, and water-reducing, set-retarding admixtures. Admixture samples shall be labeled with printed identification indicating trade name, strength, dosage instructions and manufacturer.
 14. Pozzolanic admixtures according to "Specification for Fly Ash and Raw or Calcined Natural Pozzolans for Use in Portland Cement Concrete" (ASTM C 618 type F-latest revision) and ACI 301, 4.2.1.1.c shall be limited to 15% of the minimum cement by weight.
 15. Prohibited Admixtures: Calcium chloride thycyanates or admixtures containing more than 0.1% chloride ions are not permitted..
- D. Water (ACI 301 Section 4.2.1.3)
1. Water shall be clean and free from injurious amounts of oils, acid, alkali, organic matter, or other deleterious substances. Potable tap water will normally fulfill the above requirements, but the requirements of ASTM C 94 shall be met.
 2. When subjected to the mortar strength test described in ASTM C 94-latest revision, the 28-day strength of mortar specimens made with the water under examination and normal portland cement shall be at least 100 percent of the strength of similar specimens made with distilled water.
- E. Fine Aggregate (ACI 301 Section 4.2.1.2)
1. Fine aggregate shall consist of clean, well graded particles of hard, durable sand and shall contain limited amounts of deleterious

substances. Fine aggregates shall meet the requirements of KTC Section 805 or ASTM C 33.

2. The CONTRACTOR shall deliver sand as requested by the ENGINEER to the testing laboratory for initial and periodic tests. Usually 150 pounds of sand for initial and periodic tests will be sufficient. All material delivered to the laboratory shall be accompanied by identification in writing as to supplier and source.
3. Sand shall be graded in accordance with Section 804-latest revision of the Kentucky Transportation Cabinet, Department of Highways Standard Specifications for Road and Bridge Construction - latest edition.

	Percent
Passing 3/8 inch Sieve	100
Passing No. 4 Sieve	90-100
Passing No. 16 Sieve	45-85
Passing No. 50 Sieve	5-25
Passing No. 100 Sieve	0-8

4. Sand shall meet the requirements of these Specifications and the specifications and tests listed below:

Deleterious Substances	Par. 5 - ASTM Designation C 33-latest revision.
Soundness	Par. 6 - ASTM Designation C 33-latest revision.
Organic Impurities	ASTM Designation C 33-latest revision.

F. Coarse Aggregate (ACI 301 Section 4.2.1.2)

1. Coarse aggregate shall be washed river gravel or crushed limestone of hard durable particles and shall contain limited amounts of deleterious substances. Crushed limestone shall come from ledges of a quarry approved by the Kentucky Transportation Cabinet, Department of Highways for use in reinforced concrete untreated bridge superstructures above the tops of the caps excluding pedestals.
2. The CONTRACTOR shall deliver coarse aggregate as requested by the ENGINEER to the testing laboratory for initial tests and periodic tests. Usually 200 pounds of coarse aggregate for initial and periodic tests will be sufficient. All material delivered to the laboratory shall be accompanied by identification in writing as to supplier and source.
3. Coarse aggregate shall be graded in accordance with ASTM C 33 and Section 805 of the Kentucky Transportation Cabinet, Department

of Highways Standard Specifications for Road and Bridge
 Construction-latest edition. Refer to ACI 301 Section 4.2.2.3 for
 maximum size of course aggregate.

	Percent By Weight	
	No. 57	No. 67
Passing 1-1/2-Inch Square Sieve	100	--
Passing 1-Inch Square Sieve	95-100	100
Passing 3/4-Inch Square Sieve	--	90-100
Passing 1/2-Inch Square Sieve	25-60	--
Passing 3/8-Inch Square Sieve	--	20-55
Passing No. 4 Square Sieve	0-10	0-10
Passing No. 8 Square Sieve	0- 5	0- 5

4. Coarse aggregate shall meet the requirements of these Specifications and the specifications and tests listed below:

Deleterious Substances	Par. 9 - ASTM Designation C 33- latest revision
Soundness	Par. 9 - ASTM Designation C 33- latest revision
Abrasion	Par. 9 - ASTM Designation C 33- latest revision

G. Reinforcing Steel (ACI Section 3)

1. Unless otherwise required or permitted, concrete reinforcing bars shall conform to grade 60 deformed bars and shall meet requirements of Deformed and plain Billet-Steel Bars for Concrete Reinforcement (ASTM A 615-latest revision), Rail-Steel Deformed and Plain Bars for Concrete Reinforcement (ASTM A 616-latest revision) or Axle-Steel Deformed and Plain Bars for Concrete Reinforcement (ASTM A 617-latest revision). All other reinforcement and details shall conform to ACI Standard Building Code Requirements for Reinforced Concrete (ACI 318-latest revision).
2. Before steel is shipped to job, the reinforcing steel supplier shall submit to the ENGINEER, 2 certified copies of mill tests on all steel to be used in the work. The tests shall substantiate that chemical and physical properties of the steel comply with the requirements of the governing specifications.
3. The CONTRACTOR shall carry in stock at the beginning of the concrete work the following amounts of extra reinforcing steel for replacement of lost steel or additional steel considered necessary by the ENGINEER.

5	3/8-Inch Rods	30 Feet	-	0-Inch Long
5	1/2-Inch Rods	30 Feet	-	0-Inch Long
5	5/8-Inch Rods	30 Feet	-	0-Inch Long

H. Non-shrink Grout

1. Unless otherwise required or permitted, the grout for non-shrink waterproof joints, waterproof mortar patches, filling under handrail floor flanges and anchoring bolts into existing concrete shall be Sonneborn-Contech SonogROUT, Master Builders' Masterflow 713 grout, or approved equal. The grout for use under base plates of columns, pumps, compressors, generators and similar heavy equipment, and for rebar grouting shall be Sonneborn-Contech FerroLith GNC, Master Builders' Embeco 636 or approved equal.

I. Waterstop for Construction and Control Joints

1. Waterstops shall be 6-inches wide, 3/16-inch minimum thickness, ribbed with center bulb, virgin polyvinyl chloride, in accordance with Corps of Engineers Specifications CRD-C-572, latest revision, as manufactured by Vinylex Corp., W. R. Grace Co., Southern Metal and Plastics, or approved equal.
2. Waterstops shall be furnished in maximum lengths available to reduce the number of joints to the minimum. All joints shall be lapped, as recommended by manufacturer, to make the stops continuous and watertight.

J. Waterstop for Expansion Joints

1. Waterstops, where required in expansion joints, shall be 9-inches wide, 1/4-inch minimum thickness, ribbed with center bulb, virgin polyvinyl chloride, in accordance with Corps of Engineers Specification CRD-C-572, latest revision, as manufactured by Vinylex Corp., W. R. Grace Co., or approved equal.

K. Premolded Joint Fillers

1. Joint fillers, where required, shall be Sonneborn-Contech Sonoflex F foam expansion joint filler (closed cell, ultraviolet stable, polyethylene foam), or equivalent W. R. Grace Co., products, or approved equal. Where application requires cementing the joint filler into place, such as in a wall expansion joint, a pressure-sensitive adhesive recommended by the filler manufacturer shall be used.

L. Joint Sealants and Backing for Sealants

1. For sealing vertical exposed faces of joint filters, use Sonneborn-Contech Sonolastic NPI (one component urethane) or equivalent W. R. Grace Co. products, or approved equal. For water immersion, prime with Sonneborn-Contech Primer No. 733 for concrete and masonry and Primer No.758 for glass and metals or as required by manufacturers of equivalent acceptable sealants.
2. For sealing horizontal exposed faces of joint fillers, use Sonneborn-Contech Sonolastic SL1, one-part, self-leveling, polyurethane sealant with Primer No. 733 or equivalent W.R. Grace Co. products, or approved equal.
3. Where additional sealant backing is needed to control the depth of sealant in relation to joint width, use Sonneborn-Contech Sonoflex F foam expansion joint filler or Sonofoam Backer Rod (closed cell polyethylene foam) or equivalent W. R. Grace Co. products, or approved equal.

M. Self-Leveling Floor, Deck and Sidewalk Joint Sealant

1. One-part self-leveling polyurethane sealant for concrete floors, decks, sidewalks and other horizontal contraction and expansion joints shall be Sonolastic SL1 as manufactured by Sonneborne-Contech or equivalent by W. R. Grace Company, or approved equal.
2. Sealant shall comply with Federal Specification TT-S-00230C, Type 1 Class A and ASTM C 920-latest revision, Type S, Grade P, Class 25. Joint primer shall be Sonolastic Joint Primer No. 733, or equal, shall be used where joints will be subjected to continuous or protracted periods of water immersion. When required in deep joints, backing material shall be Sonofoam Backer-Rod, or approved equal, which should not be primed and/or punctured.
3. Sealant color shall be limestone gray, tan, and/or mortar (stone) as selected by the ENGINEER unless otherwise required or permitted.

N. Concrete Floor Curing and Sealing System

1. System shall be a pigmented, ready to use, non-yellowing, acrylic curing and sealing compound which seals by providing a tough scuff resistant film over freshly finished concrete and complies with ASTM C309 and AASHTO M-148. System shall be Gray Kure-N-Seal as manufactured by Sonneborn-Contech or equivalent by W. R. Grace Company, or approved equal.

O. Vibration Isolating Pit Liners

1. Liner material shall be specifically engineered to provide optimum compression rates for inertia block foundation. Liner material shall be

unaffected by oils, coolants, cutting fluids and other liquids normally found in industrial environments.

2. Liner material shall be manufactured by the traditional felting process in two densities. A less dense material shall be used to isolate sidewalls of inertia block. A more dense material shall be applied to the base surface of the pit.
 3. Liner material shall be 1/2" thick 1B-500-S2 for the sidewalls and 1/2" thick 1B-500-B1 for each of two base layers in 3 feet by 5 feet sheets as manufactured by Unisorb, or approved equal.
 4. Vinyl or duct tape shall be used to seal joints between sheets of materials to assure that no fluid concrete enters the joints causing "short-circuiting" of the inertia block insulation.
- P. Reglets: Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 26gage galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
- Q. Dovetail Anchor Slots: Hot-dip galvanized sheet steel, not less than 0.03363 inch thick (22 gauge) with bent tab anchors. Fill slot with temporary filler or cover face opening to prevent intrusion of concrete or debris.
- R. Granular Base: Compacted layer of #57 stone, unless otherwise approved or directed by ENGINEER.
- S. Vapor Barrier: Provide vapor barrier cover [above/under] prepared base material for slabs on grade and where indicated. Use only materials which are resistant to decay when tested in accordance with ASTM E 154, as follows:

Polyethylene sheet not less than 10 mills thick.
- T. Moisture-Retaining Cover: One of the following, complying with ANSI/ASTM C 171.
- a. Waterproof paper.
 - b. Polyethylene film.
 - c. Polyethylene-coated burlap.
- U. Bonding Compound: Polyvinyl acetate, rewettable type.
- a. Products: Subject to compliance with requirements, provide one of the following:

"Weldcrete"; Larson Products.

"Everbond"; L & M Construction Chemicals.
"Euroweld"; Euclid Chemical Co.
"Daraweld C"; W.R. Grace
"Sonocrete"; Sonneborn-Contech.

V. Epoxy Adhesive: 100% solids, two component material suitable for use on dry or damp surfaces.

b. Products: Subject to compliance with requirements, provide one of the following:

"Thiopoxy"; W.R. Grace.
"Sikadur Hi-Mod"; Sika Chemical Corp.
"Euco Epoxy"; Euclid Chemical Co.

PART 3 EXECUTION

3.01 SUPPLEMENTAL REQUIREMENTS TO ACI 301-latest revision

A. ACI 301- SECTION 4 – CONCRETE MIXTURES

1. Also refer to PART 2 – PRODUCTS, for required admixtures
2. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.
 - a. Delete references for allowing additional water to be added to batch for material with insufficient slump. Addition of water to batch will not be permitted.
 - b. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.
 - c. When air temperature is between 85°F (30°C) and 90°F (32°C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F (32°C), reduce mixing and delivery time to 60 minutes. Mixing and delivery time will not have to be reduced if Type D retarder is incorporated in the mix.
 - d. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.

B. ACI 301 – SECTION 4 – PROPORTIONING

1. General - concrete shall be composed of portland cement, fine aggregate, coarse aggregate, water, and as specified, admixtures. Proportions of ingredients shall produce concrete that will work readily into corners and angles of forms, bond to reinforcement, without segregation or excessive bleed water forming on surface. Proportioning of materials shall be in accordance with ACI 211.1-91, "Recommended Practice for Selecting Proportions for Normal, Heavyweight & Mass Concrete."
2. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is used, use an independent testing facility acceptable to ENGINEER for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to ENGINEER.
3. Submit written reports to ENGINEER of each proposed mix for each class of concrete at least 45 days prior to start of work. Do not begin concrete production until mixes have been reviewed and approved by ENGINEER.
4. Required Average Strength Above Specified Strength:
Determinations of required average strength (fcr) shall be in accordance with ACI 318, "Building Code Requirements for Reinforced Concrete," and evaluations of compressive strength results of field concrete shall be in accordance with ACI 214-88, "Recommended Practice for Evaluation of Strength Test Results of Concrete."
 - a. Trial Mixes when the ready-mix producer does not have a record of past performance, the combination of materials and the proportions selected shall be selected from trial mixes having proportions and consistencies suitable for the work based on ACI 211.1, using at least three different water-cement ratios which will produce a range of strengths encompassing those required.
 - 1) Average strength (fcr) required shall be 1200 psi (8.3 MPa) above specified strength.
 - b. Past Field Experience - proportions shall be established on the actual field experience of the ready-mix producer with the materials proposed to be employed. Standard deviations shall be determined by 30 consecutive tests (or two groups of tests totaling 30 or more).
 - 1) Average strength (fcr) shall exceed specified strength (f'c) by at least:

400 psi (2.8 MPa) - standard deviation is less than 300
550 psi (3.8 MPa) - standard deviation is 300 to 400

700 psi (4.8 MPa) - standard deviation is 400 to 500
900 psi (6.2 MPa) - standard deviation is 500 to 600
1200 psi (8.3 MPa) - standard deviation is above 600
or unknown

5. Design mixes to provide normal weight concrete with the design strengths as indicated on drawings. The average strength shall exceed specified compressive strength as required in accordance with ACI 318.
6. High Early Strength Concrete: If early strength development is a requirement to meet construction schedules, the mix shall be proportioned to develop the necessary compressive strength at the required age, and data will be provided to the engineer for review.
7. 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; at no additional cost to Owner and 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.
8. ACI Section 4.2.2. Performance and Design Requirements

Add the following final paragraph:

Specified strength of concrete, $f'c$ for each structure or portion of structures shall be as follows unless otherwise required or permitted:

- a. Class 4,000 concrete ($f'c = 4,000$ psi, minimum cement factor of 620 lb/cu.yd.) for all reinforced concrete structures except as otherwise noted on the Drawings and surface courses of highway and street paving except as required for Class 4,500 concrete.
 - b. Class 3,500 concrete ($f'c = 3,500$ psi, minimum cement factor 564 lb/cu. yd.) for non-reinforced portions of manholes, control chambers, interceptor structures, grout for two-course slab toppings, grout to be screeded in place by process mechanical equipment, curbs, gutters, driveways, sidewalks, and base courses for highway and street paving.
 - c. Class 2,500 concrete ($f'c = 2,500$ psi, minimum cement factor of 450 lb./cu. Yd. And 3 to 6 inch slump) for encasement around sewers and branches for cradle or refill under conduits and fill under structures as specified or indicated on the Project Drawings.
9. ACI Section 7 – Weight

Lightweight concrete shall not be used unless otherwise required or permitted.

10. ACI Section 4 – Durability

a. ACI Section 4.2.2.4 – Air Entrainment

Substitute the following:

Classes 4,000 and 3,500 concrete required to be watertight or subjected to potentially destructive exposure (other than wear and loading) such as freezing and thawing, severe weathering or deicer chemicals shall have an entrained air content of 5 +1% by volume (6+/-1% for SRA Concrete). Measurement of air content shall meet the requirements of ASTM C231-latest revision, ASTM C173-latest revision or ASTM C138-latest revision.

11. ACI 301 Section 4.2.2 – Water-Cement Ratio/Watertightness

Substitute the following:

Classes 4,000 and 3,500 concrete which must be watertight shall have a maximum water-cement ratio of 0.45. Where watertightness is the primary concern, refer to ACI 350.

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

- a. Slabs, ramps and sloping surfaces: Not more than 3" with ordinary WRA, or 6" with MRWR.
- b. Reinforced foundation systems: Not less than 2-1/2" and not more than 4" except Foundation Walls slump to be 5" to 6".
- c. Other concrete: Not less than 1" nor more than 4".
- d. Concrete containing MRWR admixture (mid-range): Not more than 6".
- e. Concrete containing HRWR admixture (super plasticizer): Not more than 8".

C. ACI 301 Section 5 – HANDLING, PLACING, AND CONSTRUCTING.

1. ACI 301 Section 5 – Use

Add the following final paragraph:

The ENGINEER may require a set-retarding admixture if required by construction conditions. Otherwise, the CONTRACTOR shall have the option to use a retarding, a water reducing, or a water reducing set-retarding admixture. However, once accepted by the ENGINEER, the CONTRACTOR shall be consistent in admixture use, for example in all wall pours of a structure. Accelerating admixture shall not be used unless otherwise required or permitted.

2. ASTM C157-93 - Modified Testing Procedure

- a. Wet cure specimens for a period of 7 days (including the period of time the specimens are in the mold). Wet cure may be achieved either through storage in a moist cabinet or room in accordance with ASTM C 511, or through storage in lime saturated water.
- b. Report results in accordance with ASTM C 157-93 at 0, 7, 14 & 28 days of curing.

3. ASTM C157-93 Test Results – Shrinkage Requirements

- a. Shrinkage Test Results: Floor slab design requires using materials with combined shrinkage characteristic of 0.032% maximum at 28 days when tested per ASTM C-157-93. Provide documentation that the proposed mix design, using actual aggregates, additives, and cement of the proposed mix for this project as called for in Structural Notes, meets this criteria. Submit results for at least three (3) specimens. Each test takes 28 days. Start tests as soon as Contract is let so final test results are available for submittal.
- b. If a concrete mix is proposed for use without adequate documentation of the shrinkage test described above, or if mix does not meet 0.032% maximum at 28 days when tested per ASTM C-157-93, then use shrinkage reducing admixture (SRA).
 - 1) Use 1.5 gallons of SRA per cubic yard for mixes with no documentation or where tested shrinkage values exceed 0.050%.
 - 2) Use 1 gallon of SRA per cubic yard for mixes with tested shrinkage values between 0.033% and 0.050%.

D. ACI 301 SECTION 2 – FORMWORK AND FORMWORK ACCESSORIES

1. ACI Section 2.1 – General

a. ACI Section 2.1.2 – Submittals

Substitute the following:

Formwork is the CONTRACTOR'S responsibility and shop drawings will not be required.

2. ACI Section 2.2 - Products

a. ACI Section 2.2.1 Materials
2.2.1.3 - Formwork Release Agents

Add the following paragraph:

For potable water treatment facilities, the form coating shall be non-toxic after a specified period, usually 30 days.

- b. 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.
- 1) Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge- sealed, with each piece bearing legible inspection trademark.
- c. Forms for Unexposed Finish Concrete: Plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- d. Forms for Textured Finish Concrete: Units of face design, size, arrangement, and configuration to match ENGINEER'S brick face control sample. Provide solid backing and form supports to ensure stability of textured form liners.
- e. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
- f. Form Ties: Factory-fabricated, adjustable-length, removable or snapoff metal form ties, designed to prevent form deflection

and to prevent spalling concrete upon removal. Provide units which will leave no metal closer than 1-1/2" to surface.

- g. 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.
 - h. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.
 - i. 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.
3. ACI Section 2.3 – Execution

- a. ACI Section 2.3.1 Construction and erection of formwork
- b. ACI Section 2.3.2 Removal of formwork

Add the following:

Forms and shoring in the formwork used to support the weight of concrete in beams, slabs and other structural members shall remain in place until the concrete has reached 75 percent of the specified strength if, after stripping the forms, the structural system is reshored the same day of stripping and shores remain in place until the specified concrete strength is reached. Deviation from these requirements shall not occur unless otherwise required or permitted.

When shores and other vertical supports are so arranged that the non-load-carrying form facing material may be removed without loosening or disturbing the shores and supports, the facing material may be removed when the concrete has reached 50 percent of the specified strength unless otherwise required or permitted.

- c. ACI Section 2.3.3 Reshoring and backshoring
- d. ACI Section 2.3.4 Strength of concrete required for removal of formwork.
- e. ACI Section 2.3.5 Field quality control – horizontal and vertical location.

- 1) Establish and maintain controls and benchmarks in an undisturbed condition until final completion and acceptance of the project.
- 2) Variations from plumb and designated building lines shall not exceed the tolerances specified in ACI 117.

E. VAPOR BARRIER INSTALLATION

1. Place vapor barrier above compacted granular base.
2. Lap joints 6" and seal with appropriate tape

F. ACI SECTION 3 – REINFORCEMENT AND REINFORCEMENT SUPPORTS

1. ACI Section 3.1 – General
 - a. ACI Section 3.1.1 Submittals, data, and drawings

Add the following:

Submit cut sheets describing any coated reinforcement, placement spacers, or other accessories.
 - b. Reinforcing Bars: ASTM A 615, Grade 60, deformed. Bars indicated to be welded shall conform to ASTM A706 and have the approval of the ENGINEER.
 - c. Supports for Reinforcement: Provide supports for reinforcement including 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 recommendations, unless otherwise acceptable.
 - 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 which are plastic protected (CRSI, Class I) or stainless steel protected (CRSI, Class 2).
 - 3) For elevated slabs on metal deck, use standard chairs to position reinforcement at mid-height above deck ribs, unless otherwise shown.

- d. Mechanical Couplers: Couplers used for reinforcing bar splices must develop a minimum of 125% of bar yield strength. Approved manufacturers include but are not limited to “Bar-Grip System” or “Grip-Twist System” by Barsplice Products Inc.
2. ACI Section 3.3 - Execution
 - a. ACI Section 3.3.1 – Preparation
 - b. ACI Section 3.3.2 – Placement

G. INSTALLATION OF EMBEDDED ITEMS

1. General: Set and build into work 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 thereto.
2. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.
3. Install reglets to receive top edge of foundation sheet waterproofing, and to receive thru-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
4. Install dovetail anchor slots in concrete structures as noted on drawings.

H. CONCRETE PLACEMENT

1. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
 - a. Apply temporary protective covering to lower 2'-0" of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.
2. General: Comply with ACI 304, and as herein specified. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause

the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

When placing operations will involve dropping concrete more than 5 feet, the concrete shall be dropped through a tube fitted with a hopper head, or through other approved devices, as necessary to prevent segregation. This requirement shall not apply to cast-in-place piling or caissons when concrete placement is completed before initial set occurs in the first placed concrete.

3. **Placing Concrete in Forms:** Deposit concrete in forms in horizontal layers not deeper than 24" 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.
4. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.
5. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" 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 segregation of mix.
6. **Placing Concrete Slabs:** Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
7. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
8. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
9. Maintain reinforcing in proper position during concrete placement operations.
10. **Cold Weather Placing:**
 - a. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or

low temperatures, in compliance with ACI 306 and as herein specified.

- b. When air temperature has fallen to or is expected to fall below 40°F (4°C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F (10°C), and not more than 80°F (27°C) at point of placement.
- c. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
- d. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

11. Hot Weather Placing:

- a. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
- b. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90° F (32° 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.
- c. 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 embedment in concrete.
- d. Fog spray forms, reinforcing steel and subgrade thoroughly just before concrete is placed.
- e. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

H. SECTION 5 – HANDLING, PLACING, AND CONSTRUCTING

1. ACI Section 5.3.3 – Finishing concrete surfaces.

- a. Rough Form Finish: For formed concrete surfaces not exposed to view in the finish work or by other construction, unless otherwise indicated. 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" in height rubbed down or chipped off.

- b. **Smooth Form Finish:** Provide a smooth form finish to formed concrete surfaces exposed-to-view, or that are to be covered with a coating or waterproofing material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, painting or other similar system. This is an as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas, with fins or other projections completely removed and smoothed.
- c. **Grout Cleaned Finish:** Provide a grout cleaned finish to concrete surfaces which have received smooth form finish treatment, where shown on drawings or in schedules. Finish shall be performed by the following procedure:
 - 1) Combine one part portland cement to 1-1/2 parts fine sand by volume, and mix with water to consistency of thick paint. Use of proprietary additives may be used at Contractor's option. Blend standard portland cement and white portland cement, amounts determined by trail patches, so that final color of dry grout will closely match adjacent surfaces.
 - 2) Thoroughly wet concrete surfaces and 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.
- d. **Related Uniform Surfaces:** At tops of walls where horizontal offsets surfaces occur 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.
- e. Trowel finish shall be applied to concrete on which process water and sewage flow and to all surfaces normally intended as walking surfaces including surfaces to receive covering such as tile, and in working and operating areas except as required below for non-slip surfaces.
- f. Broom or belted finish shall be applied to all exterior sidewalks, steps, platforms, ramps and concrete walking surfaces and to interior sloped walking surfaces frequently cleaned by hosing such as garage floors. Brooming shall be

in the direction of the slab drainage maintaining the required surface tolerance to provide non-slip finish.

- g. Floated finish shall be applied to all surfaces intended to receive roofing, waterproofing membranes or sand bed terrazzo.
- h. Refer to Project Drawings for any special requirements.
- i. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete loading dock, stairs, ramps, stoops, and elsewhere as indicated. Flatness and levelness requirements are listed later in this section.
 - 1) Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with ENGINEER before application.
- j. Flatness and Levelness Requirements (unless otherwise noted):
 - 1) Slab on Grade: Check and level surface plane to a tolerance for floor flatness (F_F) = 28 overall value and minimum local value of 23 and floor levelness (F_L) = 20 overall value and minimum local value of 18.
 - 2) Supported Slabs: Check and level surface plane to a tolerance for floor flatness (F_F) = 25 overall value and minimum local value of 17 and floor levelness (F_L) = 20 overall and minimum local value of 15. Supported floors must be tested before any shoring is removed.
 - 3) All testing and sampling to conform to ASTM E11-55.

I. CONCRETE CURING AND PROTECTION

- 1. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- 2. 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.
- 3. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

4. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
- a. Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs as follows:
 - 1) Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with 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. Coordinate curing/sealing compounds with coating materials to verify compatibility of materials.
 - 2) Use moisture retaining covering in lieu of membrane curing compound on surfaces which are to be covered with coating materials applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring, (such as ceramic or quarry tile or glue down carpet), resinous epoxy finish, painting, and other coatings and finish materials, unless it can be documented that no reaction or bonding problem will be developed. See finish schedule(s) for proper coordination and extent of these materials.
 - 3) All interior slabs that are to remain exposed and that are not to receive special coating materials shall be cleaned and covered with one additional coat of curing and sealing compound after all construction traffic is off of slab surface.
 - b. Provide moist curing by one of the following methods:
 - 1) Keep concrete surface continuously wet by covering with water.
 - 2) Continuous water-fog spray.
 - 3) Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
 - c. Provide moisture-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" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- d. 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 full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- e. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.
 - 1) Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

K. BASIS FOR PAYMENT

1. Payment for concrete work shall include all excavation, crushed stone bedding, forms, reinforcing steel, finishing, concrete testing, etc. and shall be made on a unit price or lump sum basis where a separate bid item is provided. Otherwise payment for all concrete required for other work as shown on the PLANS shall be made on a unit price or a lump sum basis for that work.
2. Payment for concrete work shall be made only after an acceptable finish and compression tests results are obtained.

END OF SECTION

SECTION 05120
STRUCTURAL STEEL

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Structural steel framing members, structural steel support members, struts, and hoisting systems, with required bracing, welds and fasteners.
- B. Baseplates, shear stud connectors, and high strength bolts.

1.02 RELATED WORK

- A. Grouting base and bearing plates are included in Division 3.
- B. Masonry is included in Division 4.
- C. Metal fabrications are included in this Division, Section 05520.
- D. Cleaning and painting are included in Division 9, Section 09900.

1.03 REFERENCES

- A. ASTM A36 - Structural Steel.
- B. ASTM A53 - Hot-dipped, Zinc-coated Welded and Seamless Steel Pipe.
- C. ASTM A325 - High-Strength Bolts for Structural Steel Joints.
- D. ASTM A490 - Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.
- E. ASTM A500 - Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- F. ASTM A501 - Hot-formed Welded and Seamless Carbon Steel Structural Tubing.
- G. AWS D1.1 - Structural Welding Code.
- H. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
- I. Cleaning and painting are included in Division 9, Section 09900.

1.04 SUBMITTALS

- A. Submit shop DRAWINGS in accordance with Division 1, Section 01300.

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- B. **Product Data:** Submit manufacturer's technical data for each product indicated. Include test reports and certifications substantiating that product's comply with requirements.
- C. Indicate profiles, sizes, spacing and locations of structural members, connections, attachments, fasteners, cambers, loads, and shop paint primer.
- D. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS

- A. **Structural Steel Members:** ASTM A36 and A572, Grade 50.
- B. **Structural Tubing:** ASTM A500, Grade B, ASTM A501 and ASTM A53, Grade B.
- C. **Bolts, Nuts and Washers:** ASTM A325 and A490.
- D. **Welding Materials:** AWS D.1.1 - latest revision; type required for materials being welded.
- E. **Shop Primer:** Refer to Division 9, Section 09900.

2.02 FABRICATION

- A. Fabricate structural steel members in accordance with AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, latest revision and supplements.

2.03 FINISH

- A. Clean, prepare and shop prime and/or galvanize to ASTM A525 - latest revision structural steel members. Do not prime surfaces to be field welded or in contact with concrete. Provide minimum G-90 galvanized coating where galvanizing is required.

PART 3 EXECUTION

3.01 ERECTION

- A. Erect structural steel in accordance with AISC Specification.
- B. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection and installation of permanent bracing.

- C. Do not field cut or alter structural members without approval of ENGINEER.
- D. After erection, prime or cold galvanize (Section 05520) welds, abrasions, and surfaces not shop primed, or galvanized, except surfaces to be in contact with concrete. Use a primer consistent with shop coat according to Division 9, Section 09900.

END OF SECTION

SECTION 05520

METAL FABRICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, and equipment required to construct and install metal fabrications as shown on the Drawings and specified herein. Included in this section are handrails, grating, nuts, bolts, anchors, hatches, ladders, and stairs.

1.02 RELATED WORK NOT INCLUDED

- A. Concrete work is included in Division 3.
- B. Castings are included in Division 5, Section 05540.
- C. Flashing and sheet metal work for roofing is included in Division 7, Section 07600.
- D. Painting is included in Division 9, Section 09900.

1.03 QUALITY ASSURANCE

- A. All fabricated materials shall be of the highest quality, free of structural, handling, and workmanship defects.
- B. Pre-assembled items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installations.

1.04 SUBMITTALS

- A. Shop Drawings
 - 1. The CONTRACTOR shall submit to the ENGINEER in accordance with Division 1, Section 01300 detailed shop drawings of all materials to be fabricated, and shall receive the ENGINEER'S certification of review before fabrication. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor bolt installation by others. Include any requirements for surface preparation, paint products, or grout.
 - 2. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations,

material properties and other information needed for structural analysis. This shall not relieve the CONTRACTOR of responsibility for all errors, omissions, and deviations of his shop drawings from the Drawings and Specifications and from requirements of final results called for in the Drawings and Specifications.

B. Samples

1. The CONTRACTOR shall submit 2 sets of representative samples of materials and finished products as may be requested by the ENGINEER, or as specified herein.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel

1. Steel fabrication shall be done in conformity with the "AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings", latest revision and supplements.
2. Prime and paint in accordance with Division 9, unless otherwise required or permitted.
3. Unless otherwise noted on the Drawings or in the Specifications, galvanizing shall be by hot-dip process in accordance with ASTM A525 - latest revision, Coating Designation G90 (previous Coating Class Commercial 1.25 oz. per sq. ft.).
4. Damaged zinc coating shall be repaired according to Federal Specification DOD-21035A (Galvanizing Repair Spec.) and ASTM A780 - latest revision as follows:
 - a. Remove foreign matter from both damaged and contiguous undamaged area by wire brushing and cleaning with metal conditioner recommended by cold galvanizing coating manufacturer.
 - b. Apply 2 coats of cold galvanizing coating to damaged area, ensuring an overlap of the surrounding undamaged galvanizing for continuity of galvanic protection. Cold galvanizing coating shall be Z.R.C. Chemical Products Co., "Z.R.C. Cold Galvanizing," or equal.

B. Aluminum

1. Aluminum shall have a high resistance to corrosion and shall be Alloys 6061-T6, 6062-T6, 6063-T5 or 6063-T6 for wrought products such as rods, bars, standard structural shapes, extrusions, and forgings; and Alloys 214 for castings, or equal.
2. Aluminum fabrication shall be in accordance with ASCE the Aluminum Associations "Specifications for Aluminum Structures," latest revision. Welding shall be done by the argon-shielded tungsten-arc method or the automatic or semi-automatic argon-shielded consumable-electrode method, or equal. Welding rod and electrodes shall be in strict accordance with above specifications.
3. Where anodic coating is required and type is not specified or shown on the Drawings, coating shall be No. 2 Clear. Anodic coatings shall conform for the following requirements:
 - a. Clear Anodic Coatings
 - 1) The exposed surfaces of aluminum shall be cleaned of all fabricating oils and foreign matter, given a medium caustic etch pretreatment and shall receive one of the following clear anodized finishes:
 - a) No. 1 - a minimum coating thickness of 0.0004 inch (0.001 mm) and a minimum coating weight of 15.5 mg per square inch (204R1).
 - b) No. 2 - a minimum coating thickness of 0.0008 inch (0.0018 mm) and a minimum coating weight of 27.0 mg per square inch (215R1).
 - b. Color Anodic Coatings
 - 1) All aluminum parts (both extrusion and sheet stock) shall be of a controlled aluminum alloy and temper suitable for receiving an electrochemically produced hard anodic oxide coating. All aluminum parts (both extrusion and sheet stock) shall receive a caustic etch pretreatment to remove all surface foreign matter followed by an electrochemically produced anodic oxide coating having a minimum coating thickness of 0.0007 inch (0.0018 mm). Color shall be specified by the Owner and range samples shall be submitted to establish the upper and lower limits of color variations.

2.02 HANDRAILS

A. General

1. All handrail components and systems shall meet applicable federal and state regulations.

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2. All handrails shall be the fence-type handrail system, except where located inside of buildings or on steps which shall be standard post and rail handrail, unless otherwise noted on the Drawings.
3. Shop drawing submittals shall include verification that all components including base flanges, side mounting assemblies and anchor bolts can meet required strength capacities. Anchorages shall be identical to those shown on the Drawings or equal.
4. A vertical post sample with fittings and base connection shall be submitted for review and acceptance prior to preparation and submission of the shop drawings.

B. Standard Aluminum Pipe Handrail

1. Pipe for rails and posts shall be of 6063-T6 extruded aluminum with smooth standard mill finish. Scratches and discolorations uncommon to standard mill finish and sharp edges and rough surfaces shall be removed by rubbing with stainless steel wool lubricated with neutral soap solution.
2. Joints shall be welded and/or slip-on fitting type.
3. Welded joints shall be ground smooth, buffed and rubbed to a finish similar to the pipe.
4. Slip-on fittings shall be cast of magnesium aluminum alloy meeting Aluminum Association requirements for Alloy B-535.2 and furnished with stainless steel set screws. Fittings shall be "SpeedRail" and "NuRail" as manufactured by Hollaender Manufacturing Company, Cincinnati, Ohio, or equal.

C. Performance

1. Handrail system design, construction and installation shall meet or exceed all applicable Federal and State regulations. Handrail anchors, posts, rail and fabric shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.
2. The manufacturer shall submit to the ENGINEER certified test data verifying the strength of his handrail system.

2.03 STEEL PIPE RAILINGS AND HANDRAILS

- A. Fabricated steel pipe railings and handrails to design, dimensions, and details indicated. Provide railings and handrails members formed of pipe of sizes and wall thickness indicated, but not less than that required to support design loading.

- B. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
1. At tee and cross intersections provide coped joints.
 2. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe, at fabricator's option.
 3. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-connection of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
 4. Provide wall returns at ends of wall-mounted handrails, except where otherwise indicated.
 5. Close exposed ends of pipe by welding 3/16" thick steel plate in place or by use of prefabricated fittings.
 6. Toe Boards: Where required, provide toe boards at railings around openings and at the edge of open-sided floors and platforms. Fabricate to dimensions and details indicated, or if not indicated, use 4" high x 1/4" plate secured to each railing post and intermediate brackets, as required, with stainless steel fasteners. Provide for thermal expansion and contraction, as necessary, through elongated holes, or equal.
- C. Brackets, Flanges, Fittings and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.
1. For railing posts set in concrete, provide sleeves of galvanized steel pipe not less than 6" long and with inside diameter not less than 1/2" greater than the outside diameter of pipe. Provide steel plate closure welded to bottom of sleeves and of width and length not less than 1" greater than outside diameter of sleeve.
 2. Provide friction fit, removable covers designed to keep sleeves clean and hold top edge of sleeve 1/2" below finished-surface of concrete.
- D. Galvanized steel railings, including pipe, fittings, brackets, fasteners and other ferrous metal components.
- 2.04 GRATINGS
- A. Gratings shall be the dimensions required on the Drawings and as required to meet deflection specifications below and of aluminum Alloy 6063-T5, 6063-T6, or 6061-T6, or equal. Gratings shall be designed for an allowable uniformly distribution load of 200 lbs./s.f. and a concentrated load of 400

lbs./ft. of width with less than 0.25 inch deflection. Gratings shall be IKG Industries "IBAR," Reliance "ILOK," or equal.

2.05 NUTS AND BOLTS

- A. Unless otherwise shown on the Drawings or required in other parts of these Specifications, all nuts and bolts shall be in accordance with ASTM A307 - latest revision, Grade A and shall be electro-galvanized according to ASTM B633 - latest revision.
- B. All nuts, bolts, washers and accessories in contact with water, in any moist atmosphere or damp area such as occurs above water, or embedded in concrete exposed to the weather, shall be Type 302 or 304 stainless steel. Stainless steel nuts, bolts, and washers shall be used to fasten aluminum to all materials including aluminum.

2.06 CONCRETE ANCHORS

- A. Sizes and spacings or numbers of anchors shall be shown on the Drawings and materials shall comply with exposure requirements listed under Nuts and Bolts above. All anchors used for securing moving or vibrating equipment (pumps, motors, gears, sluice gates, conveyors, etc.), shall be of the cast-in-place type.
- B. The size and number of anchors shall be approved by the equipment manufacturer.
- C. Unless specifically noted otherwise on the Drawings or Specifications, concrete anchors for other applications shall be chemical grout-type anchors equal to Hilti "HVA Adhesive Anchor," or Ramset "Chemset Chemical Anchors." Installation shall be in strict accordance with the manufacturer's recommendations which shall be available on the job site.

2.07 ALUMINUM LADDERS

- A. Aluminum ladders shall be fabricated as detailed on the Drawings.

2.08 HATCHES

- A. Metal hatches shall be fabricated as detailed on the Drawings.

2.09 BOLLARDS

- A. Concrete filled, steel posts as shown on Drawings.

PART 3 EXECUTION

3.01 GENERAL

- A. The CONTRACTOR shall be responsible for all errors, omissions, and deviations of the shop drawings from the Drawing and Specifications. Any errors or omissions shall be brought to the attention of the ENGINEER whose interpretation and instructions shall be received before proceeding with the fabrication of that portion of the work.
- B. Similarly, manufacturers' printed installation instructions shall be strictly followed and any conflicts with the shop drawings and/or Contract Drawings shall be directed to the ENGINEER for resolution before proceeding with installation.
- C. All base plates, inserts and anchorages shown embedded in concrete shall be accurately located and secured before placing concrete as per a manufacturer supplied template. All structural members and components shall be accurately leveled, plumbed and secured at location shown on the Drawings.
- D. Painting
 - 1. Cleaning and painting of all fabricated materials shall be in strict accordance with Division 9, Section 09900, of these specifications.
- E. Steel
 - 1. All fabrication and erection shall be done in conformity with the "AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," - latest revision.
 - 2. Refer to Article 2.01.A of this Specification Section for repair of galvanized surfaces.
- F. Aluminum
 - 1. The contact surfaces of aluminum with steel, dissimilar materials, concrete and/or masonry shall be protected from corrosion by a thick coating of coal tar, Koppers Bitumastic No. 50, or equal.
 - 2. Aluminum surfaces embedded in concrete shall be protected from corrosion by a tightly adherent coating of 2 applications of zinc chromate primer.

3.02 HANDRAILS

- A. General
 - 1. Refer to Article 2.02 this Section for types of handrails.
 - 2. Shop drawings and handrail manufacturer's printed instructions shall be closely followed during handrail installation. Posts shall be installed plumb and rails parallel.

3. Required anchorages shall be strictly followed.

B. Workmanship

1. All rail and post cuts shall be square and accurate for minimum joint gap, clean and straight, and free of burrs and nicks.
2. In exterior and high humidity interior fabricated fitting installations, provision shall be made to drain entrapped water from inside the railing system to prevent electrolysis and/or damage from freezing. Manufacturer's printed instructions shall be strictly followed.
3. Welds and damaged areas shall be finished and coated according to Article 2.02, this Section.
4. Where required, holes shall be drilled and countersunk the correct size for proper fit of all components.
5. In aluminum handrail systems where protection is applied for prevention of electrolysis from dissimilar materials, visibility of protective material shall be minimized.
6. Handrail system surfaces shall be protected from physical damage and discoloration during storage, assembly and installation. Manufacturer's coverings to protect anodized finishes shall be left intact until damage from construction operations no longer exists.

C. Rigidity

1. Posts shall be continuous from mounting surface to top rail.
2. Top and bottom rails shall be un-spliced lengths between post except as covered under expansion joints.
3. Railing manufacturer's instructions shall be strictly followed regarding torquing and tightening of fittings, and type and materials of fasteners.
4. Only stainless steel fasteners shall be used in aluminum installations, unless otherwise noted.

D. Expansion Joints

1. To prevent excessive stresses and misalignment in standard joints and gaps shall be provided in top and bottom rails. Joints shall be located within 8 inches of posts and supports and the top and bottom rail joints shall be in vertical alignment. In fence-type handrail systems, top rail couplings shall be furnished with galvanized expansion compression spring as required in Part 2, this Section.

2. Where sleeve-type expansion joints are used, fasten only one side of sleeve to rail and allow other side of sleeve to slide on adjacent rail in standard aluminum handrail systems.
3. Gaps shall be provided according to the table below which is based on the coefficients of expansion of 0.000013 inch/°F for aluminum and 0.000065 inch/°F for steel; a temperature difference of 120°F less the minimum listed temperature; and an expansion joints spacing of 24'-0" on centers for aluminum and 40'-0" on centers for steel. Where it is know that other temperature differentials and/or expansion joint spacings will be experienced, gap dimensions can be determined by: gap in inches = (coefficient of expansion) x temperature difference from maximum to minimum) x (distance in inches between expansion joints).

EXPANSION JOINTS GAP TABLE

Gap Dimension Required at Each Expansion Joint

Temperature (°F) at Time of Installation	Aluminum Railing with Expansion Joints on 24' - 0" Centers	Steel Railing with Expansion Joints on 40' - 0" Centers
	-20 to 0	1/2"
0 to 20	7/16"	3/8"
20 to 35	3/8"	5/16"
35 to 50	5/16"	1/4"
50 to 70	1/4"	1/4"
70 to 90	3/16"	3/16"
90 to 12	1/8"	1/8"

3.03 GRATINGS

- A. Grating frames shall be installed flush with the floor surfaces. Adequate blocking shall be provided to hold corners square during placing concrete and exposed aluminum surfaces shall be protected to prevent pitting from the concrete. Surfaces embedded in concrete shall be protected as covered under Article 3.01, this Section.

3.04 NUT AND BOLTS

- A. Refer to Article 2.05, this Section, for material requirements.
- B. Bolts embedded in concrete shall be secured with templates at the time of pouring concrete. Bolts shall be suitably protected from damage throughout the construction period.
- C. Damaged galvanized surfaces on nuts and bolts shall be repaired according to Article 2.05, this Section.

3.05 CONCRETE ANCHORS

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- A. Refer to Article 2.06, this Section, for anchor specifications.
- B. Concrete anchors shall be installed strictly in accordance with manufacturer's printed instructions which shall be available on the job site.
- C. Refer to Division 15 for supporting small pipe.

3.06 LADDERS

- A. Install ladders as herein specified and as detailed on the Drawings.

3.07 HATCHES

- A. Install hatches as herein specified and as detailed on the Drawings.

3.08 BOLLARDS

- A. Set in concrete as indicated. Fill cores solidly with air-entrained concrete having a 28-day minimum compressive strength at 3,000 psi.

END OF SECTION

SECTION 05540

CASTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, and equipment required to install castings as shown on the Drawings and specified herein. Included in this section are manhole covers, steps, valve boxes, and hatch covers.

1.02 RELATED WORK NOT INCLUDED

- A. Concrete work is included in Division 3.
- B. Surface preparation and furnishing of castings is included in Division 9, Section 09900.

1.03 SUBMITTALS

The CONTRACTOR shall submit to the ENGINEER, in accordance with Division 1, Section 01300, copies of construction details of castings proposed for use.

PART 2 MATERIALS

2.01 GENERAL

- A. All castings shall be gray iron, conforming to the requirements of the ASTM Standards, Designation A48 - latest revision, Class 35B.

2.02 MANHOLE CASTINGS

- A. Frames and Covers
 - 1. Sanitary sewer manhole castings shall consist of cast iron frames and 22-3/4 inch diameter covers, having a combined weight of not less than 350 pounds for out of traffic locations and 460 pounds for traffic locations. The frame shall be at least 7 inches high overall. Manhole covers must set neatly in the frame, with contact surfaces machined smooth for even bearing. The top of the cover shall be flush with the frame edge. The top of the cover shall sufficient corrugations to prevent slipperiness and be marked in large letters "SANITARY SEWER." Covers shall have one pick hole only, about 1-1/2 inches wide and 3/4 inch deep with 3/8 inch square undercut at rear and 3/4 inch square undercut on sides. Covers on sanitary sewer manholes must not be perforated and shall be as manufactured by J.R. Hoe & Sons, Inc. or approved equal.

2. Storm sewer manhole castings shall consist of cast iron frames and 22-3/4 inch diameter grate type covers, having a combined weight of not less than 460 pounds. The frames shall be at least 7 inches high overall. Manhole covers must set neatly in the frame with contact surfaces machined smooth for even bearing. The top of the cover shall be flush with the frame edge. The castings shall be Neenah Foundry Company with type "D" grate, or approved equal.

B. Steps

1. Cast iron or polypropylene plastic encapsulated steel manhole steps shall be patterns shown on the detail Drawings, and have corrugated treads. In case of need for non-protruding steps, shop drawings of special inset cast iron steps shall be reviewed by and be acceptable to the ENGINEER.
2. If a step constructed of another material is going to be considered, shop drawings will need to be submitted far enough in advance to allow consideration.
3. It is intended that the cast iron step be Neenah Foundry Company's R-1980-E, or equal, and the polypropylene plastic encapsulated steel step be M.A. Industries PS-1, or equal.

2.03 VALVE BOXES

A. Slip Type for Iron Body Gate Valves

1. Valve boxes for 2 inch through 10 inch valves shall be the 2 piece slip type, without screw, of sufficient length to allow for 36 inches of cover over the top of the pipe, Tyler 6855 series, model #562-A, or approved equal. The inner section shall have a minimum inside diameter of 5-1/4 inches with a hood type base that will cover the packing gland on a 2 inch through 10 inch valve (minimum of 8 inches inside diameter). The base of the top section shall be flanged at least 1-1/4 inches. The caps shall be circular with a corrugated surface and have pick holes in the periphery and be marked "Water", "Gas", "Sewer", or "Air" according to use. For 12 inch through 16 inch valves, the valve boxes shall be Opelika Foundry Company No. 4907 for cast iron or approved equal.
2. Valve boxes for valves in the horizontal position shall be Opelika Foundry Company No. 4907 for cast iron or approved equal, with a base that is sized to allow covering of the bevel gear case and centering of the operating nut in the valve box.

PART 3 EXECUTION

3.01 INSTALLATION

- A. The installation of castings is generally covered under specifications for pipe work and manholes. Castings shall be leveled, plumbed, secured, and installed in accordance with the Drawings.

END OF SECTION

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SECTION 09900

COATING SYSTEMS FOR POTABLE WATER SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coating systems for potable water processing and storage facilities.

1.2 RELATED SECTIONS

- A. Section 02610 – General Piping (In particular, see requirements for ductile iron pipe lining).
- B. Section 09250 – Gypsum Drywall.
- C. Section 08120 – Hollow Metal Doors and Frames.
- D. Section 15075 - Mechanical Identification: Identification of mechanical equipment & piping.
- E. Section 13120 – Specification for Metal Building.
- F. Section 16195 – Electrical Identification: Identification of electrical equipment.

1.3 REFERENCES

- A. ASTM D 16 - Terminology Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D 4263 - Indicating Moisture in Concrete by the Plastic Sheet Method.
- C. ASTM F 1869 - Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- D. International Concrete Repair Institute (ICRI) Guideline No. 03732 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
- E. NACE RP0188 - Standard Recommended Practice, Discontinuity (Holiday) Testing of Protective Coatings.
- F. NAPF 500-03-04 Abrasive Blast Cleaning.
- G. NAPF 500-03-03 Power Tool Cleaning.
- H. SSPC-SP 1 - Solvent Cleaning.
- I. SPPC-SP 5/NACE 1 - White Metal Blast Cleaning.

- J. SSPC-SP 6/NACE 3 - Commercial Blast Cleaning.
- K. SSPC-SP 10/NACE 2 - Near-White Metal Blast Cleaning.
- L. SSPC-SP 13/NACE 6 - Surface Preparation of Concrete.

1.4 DEFINITIONS

- A. Definitions of Painting Terms: ASTM D 16, unless otherwise specified.
- B. Dry Film Thickness (DFT): Thickness of a coat of cured paint measured in mils (1/1000 inch).
- C. Exposed Surface: A surface is considered exposed if it is subject to contact with air and/or water after installation is complete. Surfaces hidden in walls, above ceilings, in pipe chases, etc., are considered exposed. Metal to like metal surfaces, steel embedded in concrete, or similar embedded work products are not considered exposed.

1.5 SUBMITTALS

- A. Comply with Section 01300 - Submittal Procedures.
- B. Product Data: Submit manufacturer's product data for each coating, including generic description, complete technical data, surface preparation, and application instructions.
- C. Color Samples: Submit manufacturer's color samples showing full range of standard colors.
- D. Manufacturer's Quality Assurance: Submit manufacturer's certification that coatings comply with specified requirements and are suitable for intended application.
- E. Applicator's Quality Assurance: Submit list of a minimum of 5 completed projects of similar size and complexity to this Work. Include for each project:
 - 1. Project name and location.
 - 2. Name of owner.
 - 3. Name of contractor.
 - 4. Name of engineer.
 - 5. Name of coating manufacturer.
 - 6. Approximate area of coatings applied.
 - 7. Date of completion.

F. Warranty: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Specialize in manufacture of coatings with a proven successful experience.
2. Able to demonstrate successful performance on comparable projects.
3. Single Source Responsibility: Coatings and coating application accessories shall be products of a single manufacturer.

B. Applicator's Qualifications:

1. Experienced in application of specified coatings on projects of similar size and complexity to this Work.
2. Applicator's Personnel: Employ persons trained for application of specified coatings.

C. Preapplication Meeting: Convene a preapplication meeting two [2] weeks before start of application of coating systems. Require attendance of parties directly affecting work of this section, including Contractor, Engineer, applicator, and manufacturer's representative. Review the following:

1. Environmental requirements.
2. Protection of surfaces not scheduled to be coated.
3. Surface preparation.
4. Application.
5. Repair.
6. Field quality control.
7. Cleaning.
8. Protection of coating systems.
9. One-year inspection.
10. Coordination with other work.

D. Mock-Ups: Prepare 2 foot x 2 foot mock-up for each coating system specified using same materials, tools, equipment, and procedures intended for actual

surface preparation and application. Obtain Engineer's approval of mock-ups. Retain mock-ups to establish intended standards by which coating systems will be judged.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying:
1. Coating or material name.
 2. Manufacturer.
 3. Color name and number.
 4. Batch or lot number.
 5. Date of manufacture.
 6. Mixing and thinning instructions.
- B. Storage:
1. Store materials in a clean dry area and within temperature range in accordance with manufacturer's instructions.
 2. Keep containers sealed until ready for use.
 3. Do not use materials beyond manufacturer's shelf life limits.
- C. Handling: Protect materials during handling and application to prevent damage or contamination.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Weather:
1. Air and Surface Temperatures: Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with manufacturer's instructions.
 2. Surface Temperature: Minimum of 5 degrees F (3 degrees C) above dew point.
 3. Relative Humidity: Prepare surfaces and apply and cure coatings within relative humidity range in accordance with manufacturer's instructions.
 4. Precipitation: Do not prepare surfaces or apply coatings in rain, snow, fog, or mist.

5. Wind: Do not spray coatings if wind velocity is above manufacturer's limit.
- B. Ventilation: Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with AWWA D 102.
- C. Dust and Contaminants:
 1. Schedule coating work to avoid excessive dust and airborne contaminants.
 2. Protect work areas from excessive dust and airborne contaminants during coating application and curing.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Tnemec Company Incorporated, or approved equal.
- B. When submitting for consideration coatings proposed to be substituted as equivalent to the specified coatings, the CONTRACTOR shall submit to the ENGINEER notarized certificates on the letterhead of the firm manufacturing the proposed substitution certifying that the proposed substitution is the equivalent of the specified material in quality and performance, and that the proposed substitution is suitable for the intended use. The CONTRACTOR shall also submit to the ENGINEER on the letterhead of the firm manufacturing the proposed substitution a list of installations similar to the installation for which the products are being proposed, at which installations the proposed products have performed reliably in similar service; this list shall include the name, address, and telephone number of the OWNER of each installation, and the name of that OWNER'S employee who is responsible for maintenance and construction.
- C. Substitutions which decrease the film thickness, the number of coats applied, change the generic type of coating, or fail to meet the performance criteria of the specified materials will not be approved. Prime and finish coats of all surfaces shall be furnished by the same manufacturer.

2.2 COATING SYSTEMS FOR STEEL - STRUCTURAL, TANKS, PIPE, EQUIPMENT, AND MISCELLANEOUS

- A. Exterior Exposed:

1. System Type: MCU/epoxy/urethane.
 2. Surface Preparation: SSPC-SP 6.
 3. Primer: Omnithane, DFT 2.5 to 3.5 mils.
 4. Intermediate Coat: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
 5. Finish Coat: Series 1074 Endura-Shield. DFT 2.0 to 3.0 mils.
 6. Total DFT: 6.5 to 9.5 mils.
 7. Finish Color: As indicated on the drawings.
- B. Interior Exposed – No Contact with Potable Water:
1. System Type: MCU/epoxy.
 2. Surface Preparation: SSPC-SP 6.
 3. Primer: Omnithane, DFT 2.5 to 3.5 mils.
 4. Finish Coat: Series N69 Hi-Build Epoxoline II. DFT 4.0 to 6.0 mils.
[May require two coats if brush or roller applied].
 5. Total DFT: 6.5 to 9.5 mils.
 6. Finish Color: As indicated on the drawings.
- C. H2S Gas Exposed:
1. System Type: MCU/Perma-Glaze.
 2. Surface Preparation: SSPC-SP 5.
 3. Primer: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
 4. Finish Coat: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
 5. Total DFT: 30.0 to 40.0 mils.
 6. Finish Color: [5021 Gray] [5022 Beige].
- D. Immersion – Contact with Potable Water:
1. System Type: MCU/epoxy.
 2. Surface Preparation: SSPC-SP 10.

3. Primer: Omnithane, DFT 2.5 to 3.5 mils.
3. Intermediate Coat: Series N140-1255 Pota-Pox Plus DFT 4.0 to 6.0
4. Stripe Coat: Series N140-15BL Pota-Pox Plus applied by brush to all weld seams and sharp edges DFT 3.0-5.0
5. Finish Coat: Series N140-Tnemec White. DFT 4.0 to 6.0 mils.
6. Total DFT: 10.5 to 15.5 mils.
7. Finish Color: As indicated on the drawings.

2.3 COATING SYSTEMS FOR GALVANIZED STEEL AND NONFERROUS METAL - PIPE AND MISCELLANEOUS FABRICATIONS

A. Exterior Exposed:

1. System Type: Epoxy/urethane.
2. Surface Preparation: SSPC-SP 1 - Solvent Cleaning and etch.
3. Primer: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
4. Finish Coat: Series 1074. DFT 2.0 to 3.0 mils.
5. Total DFT: 4.0 to 6.0 mils.
6. Finish Color: As indicated on the drawings, or color schedule.

B. Interior Exposed – No Contact with Potable Water:

1. System Type: Epoxy.
2. Surface Preparation: SSPC-SP 1 - Solvent Cleaning and etch.
3. Primer: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
4. Finish Coat: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
5. Total DFT: 4.0 to 6.0 mils.
6. Finish Color: As indicated on the drawings, or color schedule.

C. H2S Gas Exposed:

1. System Type: MCU/Perma-Glaze.
2. Surface Preparation: SSPC-SP 1 - Solvent Cleaning and severely

etch.

3. Primer: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
4. Finish Coat: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
5. Total DFT: 30.0 to 40.0 mils.
6. Finish Color: [5021 Gray] [5022 Beige].

D. Immersion – Contact with Potable Water:

1. System Type: Epoxy.
2. Surface Preparation: SSPC-SP 1 followed by abrasive blast.
3. Primer Coat: Series N140-15BL Pota-Pox Plus DFT 4.0-6.0
4. Finish Coat: Series N140-1255 Pota-Pox Plus DFT 4.0 to 6.0
5. Total DFT: 7.0 to 11.0 mils.

2.4 COATING SYSTEMS FOR DUCTILE OR CAST IRON - PIPE, PUMPS, AND VALVES

A. Exterior Exposed:

1. System Type: MCU/epoxy/urethane.
2. Surface Preparation: NAPF 500-03-03 Power Tool Cleaning.
3. Primer: Omnithane, DFT 2.5 to 3.5 mils.
4. Intermediate Coat: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
5. Finish Coat: Series 1074 Endura-Shield. DFT 2.0 to 3.0 mils.
6. Total DFT: 6.5 to 9.5 mils.
7. Finish Color: As indicated on the drawings, or color schedule.

B. Below Ground (Buried):

1. System Type: Coal tar epoxy.
2. Surface Preparation: NAPF 500-03-04 Abrasive Blast Cleaning.
3. Finish Coat: Series 46H-413 Hi-Build Tneme-Tar. DFT 14.0 to 20.0 mils.

4. Total DFT: 14.0 to 20.0 mils.
5. Finish Color: As indicated on the drawings, or color schedule.

C. Interior Exposed:

1. System Type: MCU/Epoxy.
2. Surface Preparation: Surface Preparation: NAPF 500-03-03 Power Tool Cleaning.
3. Primer: Omnithane, DFT 2.5 to 3.5 mils.
4. Finish Coat: Series N69 Hi-Build Epoxoline II. DFT 4.0 to 6.0 mils. *[May require two coats if brush or roller applied].*
5. Total DFT: 6.5 to 9.5 mils.
6. Finish Color: As indicated on the drawings, or color schedule.

D. H2S Gas Exposed:

1. System Type: MCU/Perma-Glaze.
2. Surface Preparation: Surface Preparation: NAPF 500-03-04 Abrasive Blast Cleaning.
3. Primer: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
4. Finish Coat: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
5. Total DFT: 30.0 to 40.0 mils.
6. Finish Color: [5021 Gray] [5022 Beige].

E. Immersion – Contact with Potable Water:

1. System Type: MCU/Epoxy.
2. Surface Preparation: NAPF 500-03-04 Abrasive Blast Cleaning.
3. Primer: Omnithane, DFT 2.5 to 3.5 mils.
4. Intermediate Coat: Series N140 Pota-Pox Plus DFT 4.0-6.0
5. Finish Coat: Series N140 Pota-Pox Plus. DFT 4.0 to 6.0 mils.
6. Total DFT: 10.5 to 15.5 mils.

2.5 COATING SYSTEMS FOR PVC

A. Exterior Exposed:

1. System Type: Epoxy/urethane.
2. Surface Preparation: Scarify.
3. Primer: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
4. Finish Coat: Series 1074 Endura-Shield. DFT 2.0 to 3.0 mils.
5. Total DFT: 4.0 to 6.0 mils.
6. Finish Color: As indicated on the drawings, or color schedule.

B. Interior Exposed:

1. System Type: Epoxy.
2. Surface Preparation: Scarify.
3. Primer: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
4. Finish Coat: Series N69 Hi-Build Epoxoline II. DFT 2.0 to 3.0 mils.
5. Total DFT: 4.0 to 6.0 mils.
6. Finish Color: As indicated on the drawings.

2.6 COATING SYSTEMS FOR INSULATED PIPE

A. Interior/Exterior Exposed:

1. System Type: Acrylic.
2. Surface Preparation: Clean and dry.
3. Primer: Series 28 Tufcryn. DFT 1.5 to 2.0 mils.
4. Finish Coat: Series 28 Tufcryn. DFT 1.5 to 2.0 mils.
5. Total DFT: 2.0 to 3.0 mils.
6. Finish Color: As indicated on the drawings, or color schedule.

2.7 COATING SYSTEMS FOR PRECAST CONCRETE, CAST-IN-PLACE CONCRETE, AND DENSE CONCRETE MASONRY UNITS

A. Exterior Exposed:

1. System Type: Acrylate.
 2. Surface Preparation: SSPC-SP 13/NACE 6. Clean and dry.
 3. Primer: Series 156 Enviro-Crete. Spreading Rate 125 sf/gal.
 4. Finish Coat: Series 156 Enviro-Crete. Spreading Rate 200 sf/gal.
 6. Finish Color: As indicated on the drawings.
- B. Below Grade (Soil Side):
1. System Type: Coal tar epoxy.
 2. Surface Preparation: SSPC-SP 13/NACE 6. Clean and dry.
 3. Primer: None.
 4. Finish Coat: 46H-413 Hi-Build Tneme-Tar. DFT 14.0 to 20.0 mils.
 5. Total DFT: 14.0 to 20.0 mils.
 6. Finish Color: Black.
- C. H2S Gas Exposed and Severe Immersion:
1. System Type: Perma-Shield H2S/Perma-Glaze.
 2. Surface Preparation: SSPC-SP 13/NACE 6 and ICRI Guideline 03732, CSP-5
 3. Surfacer: Series 218 MortarClad and/or Series 219 MortarCast.
 4. First Coat: Series 434 Perma-Shield H2S. Nominal DFT 125 mils.
 5. Finish Coat: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
 6. Total DFT: Over 140 mils.
 7. Finish Color: [5021 Gray] [5022 Beige].
- D. Immersion – Contact with Potable Water:
1. System Type: Epoxy.
 2. Surface Preparation: SSPC-SP 13/NACE 6 and ICRI Guideline 03732, CSP-3.
 3. Primer: Series N140 Pota-Pox Plus DFT 3.0 to 5.0 mils.

4. Intermediate Coat: Series N140 Pota-Pox Plus. DFT 4.0 to 6.0 mils.
 5. Finish Series N140 Pota-Pox Plus. DFT 4.0 to 6.0 mils.
 6. Total DFT: 11.0 to 17.0 mils.
 7. Finish Color: As indicated on the drawings, or color schedule.
- E. Interior Exposed:
1. System Type: Epoxy [Spay apply, or addition coats may be required].
 2. Surface Preparation: SSPC-SP 13/NACE 6 and ICRI Guideline 03732, CSP-3.
 3. Primer: Series 113 H.B. Tneme-Tufcoat. DFT 4.0 to 6.0 mils. Roll or backroll.
 4. Finish Coat: Series 113 H.B. Tneme-Tufcoat. DFT 4.0 to 6.0 mils.
 5. Total DFT: 8.0 to 12.0 mils.
 6. Finish Color: As indicated on the drawings, or color schedule.

2.8 COATING SYSTEMS FOR CONCRETE FLOORS

- A. Mild Exposure:
1. System Type: Silicate Blend.
 2. Surface Preparation: Clean & Dry. No curing compounds.
 3. Primer: Series 629 CT Densifyer 201. 300-350 sq. ft./gal.
 4. Finish Coat: 629 CT Densifyer 201. 350-400 sq. ft./gal.
 6. Total DFT: N/A.
 7. Finish Color: As selected by Architect from manufacturer's standard colors.
- B. Heavy Traffic and Chemical Exposure :
1. System Type: Aggregate-filled epoxy/urethane.
 2. Surface Preparation: SSPC-SP 13/NACE 6 and ICRI Guideline 03732, CSP-5.
 3. First Coats: Series 237 Power-Tread, double broadcast. DFT 1/8 inch.

4. Intermediate Coat: Series 280 Theme-Glaze. DFT 6.0 to 8.0 mils.
5. Finish Coat: Series 290 CRU. DFT 2.0 to 3.0 mils.
6. Total DFT: Greater than 1/8 inch.
7. Finish Color: As indicated on the drawings. [Limited Color Selection]
8. Finish Texture: As required by the Engineer.

C. H2S Gas Exposed:

1. System Type: Perma-Shield H2S/Perma-Glaze.
2. Surface Preparation: SSPC-SP 13/NACE 6 and ICRI Guideline 03732, CSP-5
3. Surfacer: Series 218 MortarClad and/or Series 219 MortarCast.
4. First Coat: Series 434 Perma-Shield H2S. Nominal DFT 125 mils.
5. Finish Coat: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
6. Total DFT: Over 140 mils.
7. Finish Color: [5021 Gray] [5022 Beige].

D. Decorative:

1. System Type: Ceramic-filled epoxy.
2. Surface Preparation: SSPC-SP 13/NACE 6 and ICRI Guideline 03732, CSP-5.
3. First Coats: Series 222 Deco-Tread, double broadcast. DFT 1/8 inch.
4. Finish Coat: Series 284 Deco-Clear. DFT 8.0 to 10.0 mils.
5. Total DFT: Greater than 1/8 inch.
6. Finish Color: As indicated on the drawings.
7. Finish Texture: As required by the Engineer.

E. High-Build Epoxy/Urethane Floor Coating

1. Surface Preparation: Shot Blast or Mech. Abrade (ICRI CSP 3-5).
2. Primer for concrete: Series 281 Theme-glaze. DFT 6.0 to 8.0 mils.

3. Base Coat: Series 224 Deco-Fleck (broadcast flake to refusal or as directed by Engineer). Liquid DFT 8.0 to 10.0 Mils.
4. Grout Coat: Series 224 Deco-Fleck. DFT 8.0 to 10.0 Mils.
5. Intermediate Coat: Series 224 Deco-Fleck. DFT 8.0 to 10.0 Mils.
6. Finish Coat: Series 295 Clear CRU. DFT 2.0 to 3.0 Mils
7. Total DFT: 24.0 to 31.0 Mils.
8. Finish Color & Pattern: As selected by Architect from manufacturer's standard colors.

2.9 COATING SYSTEMS FOR SECONDARY CONTAINMENT

A. Chemical Storage Containment Area

1. System Type: High-solids epoxy.
2. Surface Preparation: SSPC-SP 13/NACE 6 and ICRI Guideline 03732, CSP-5.
3. Primer: Series 201 Epoxoprime. DFT 6.0 to 8.0 mils.
4. Intermediate Coat: Series 275 Stranlock. DFT 25.0 to 40.0 mils.
5. Finish Coat: Series 282 Tneme-Glaze. DFT 8.0 to 12.0 mils.
6. Total DFT: 39.0 to 60 mils.
7. Finish Color: As indicated on the drawings. [Limited Color Selection]

B. Floors, Severe Chemical, Abrasion, and Traffic Exposure:

1. System Type: Aggregate-filled epoxy novalac.
2. Surface Preparation: SSPC-SP 13/NACE 6 and ICRI Guideline 03732, CSP-5.
3. First Coats: Series 239 Chemtread, double broadcast. DFT 1/8 inch.
4. Finish Coat: Series 282 Tneme-Glaze. DFT 6.0 to 8.0 mils.
5. Total DFT: Greater than 1/8 inch (125 mils).
6. Finish Color: As indicated on the drawings. [Limited Color Selection]

2.10 COATING SYSTEMS FOR POROUS CONCRETE MASONRY UNITS

A. Exterior Exposed:

1. System Type: Siloxane/Silane Water Repellent/ Methylmethacrylate Acrylic Stain.
2. Surface Preparation: SSPC-SP 13/NACE 6. Clean and dry.
3. First Coat: Series 662 Prime-A-Pell Plus. Spreading rate 65 to 85 sq. ft/gal.
4. Second Coat: Series 662 Prime-A-Pell Plus. Apply second coat wet-on-wet to saturation. Block receiving accent stain do not require a second coat.
5. Accent Stain: Series 607 Conformal Stain. Spreading rate 75 to 100 sq. ft/gal per coat. Apply two coats.
6. Total DFT: N/A.
7. Finish Color: As selected by Architect from manufacturer's standard colors.

B. Interior Exposed:

1. System Type: Cementitious Acrylic/epoxy.
2. Surface Preparation: SSPC-SP 13/NACE 6. Clean and dry.
3. Primer: Series 130 Masonry Filler. Spreading rate 80 to 100 sq. ft/gal.
4. Intermediate Coat: 113 H.B. Tneme-Tufcoat. DFT 2.0 to 3.0 mils.
5. Finish Coat: Series 113 H.B. Tneme-Tufcoat. DFT 2.0 to 3.0 mils.
6. Total DFT: 4.0 to 6.0 mils plus filler.
7. Finish Color: As selected by Architect from manufacturer's standard colors.

C. H2S Gas Exposed:

1. System Type: Perma-Shield H2S/Perma-Glaze.
2. Surface Preparation: SSPC-SP 13/NACE 6. Clean and dry.
3. Primer: Series 130 Masonry Filler. Spreading rate 80 to 100 sq. ft/gal.
4. First Coat: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.
5. Finish Coat: Series 435 Perma-Glaze. DFT 15.0 to 20.0 mils.

6. Total DFT: 30.0 to 40.0 mils plus filler.
7. Finish Color: [5021 Gray] [5022 Beige].

2.11 COATING SYSTEMS FOR PLASTER, GYPSUM BOARD, AND WOOD

- A. Interior Exposed:
1. System Type: Epoxy/acrylic-epoxy.
 2. Surface Preparation: Clean and dry.
 3. Primer: Series 151-1051 Elasto-Grip FC. DFT 1.0 to 1.5 mils.
 4. Intermediate Coat: Series 113 H.B. Tneme-Tufcoat. DFT 2.0 to 3.0 mils.
 5. Finish Coat: Series 113 H.B. Tneme-Tufcoat. DFT 2.0 to 3.0 mils.
 6. Total DFT: 5.0 to 7.5 mils.
 7. Finish Color: As selected by Architect from manufacturer's standard colors.

2.12 ACCESSORIES

- A. Coating Application Accessories:
1. Accessories required for application of specified coatings in accordance with manufacturer's instructions, including thinners.
 2. Products of coating manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which coating systems are to be applied. Notify Engineer of areas or conditions not acceptable. Do not begin surface preparation or application until unacceptable areas or conditions have been corrected.

3.2 PROTECTION OF SURFACES NOT SCHEDULED TO BE COATED

- A. Protect surrounding areas and surfaces not scheduled to be coated from damage during surface preparation and application of coatings.
- B. Immediately remove coatings that fall on surrounding areas and surfaces not scheduled to be coated.

3.3 SURFACE PREPARATION OF STEEL

- A. Prepare steel surfaces in accordance with manufacturer's instructions.
- B. Fabrication Defects:
 - 1. Correct steel and fabrication defects revealed by surface preparation.
 - 2. Remove weld spatter and slag.
 - 3. Round sharp edges and corners of welds to a smooth contour.
 - 4. Smooth weld undercuts and recesses.
 - 5. Grind down porous welds to pinhole-free metal.
 - 6. Remove weld flux from surface.
- C. Ensure surfaces are dry.
- D. Immersion or Below Grade Surfaces: Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 10/NACE 2. Create a blast profile of 1.5 to 2.5 mils.
- E. Exterior Exposed or Interior Exposed Surfaces: Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 6/NACE 3. Create a blast profile of 1.5 to 2.5 mils.
- F. H₂S Gas Exposed: Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 10/NACE 1. Create a blast profile of at least 3.0 mils.
- G. Abrasive Blast-Cleaned Surfaces: Coat abrasive blast-cleaned surfaces with primer before visible rust forms on surface. Do not leave blast-cleaned surfaces uncoated for more than 8 hours.
- H. Shop Primer: Prepare shop primer to receive field coat in accordance with manufacturer's instructions. Removal all unknown shop primers and re-prime in accordance with this specification.

3.4 SURFACE PREPARATION OF GALVANIZED STEEL AND NONFERROUS METAL

- A. Prepare galvanized steel and nonferrous metal surfaces in accordance with this specification and the coating manufacturers instructions.
- B. Ensure surfaces are dry.
- C. Immersion Service: Clean surfaces by abrasive blasting.

- D. Remove Rust From Galvanized Steel:
 - 1. Remove white rust from galvanized steel by hand or power brushing.
 - 2. Do not damage or remove galvanizing.
- E. Increase mechanical adhesion under moderate to severe conditions, such as exterior exposure or chemical environments, by abrasive blast and/or chemical cleaning.

3.5 SURFACE PREPARATION OF DUCTILE OR CAST IRON

- A. Prepare ductile or cast iron surfaces in accordance with NAPF 500-03-04 Abrasive Blast Cleaning or NAPF 500-03-03 Power Tool Cleaning and the coating manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

3.6 SURFACE PREPARATION OF PVC

- A. Prepare PVC surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- C. Scarify PVC surfaces.

3.7 SURFACE PREPARATION OF INSULATED PIPE

- A. Prepare insulated pipe surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

3.8 SURFACE PREPARATION OF CONCRETE

- A. Interior, Wet Substrate:
 - 1. Prepare concrete surfaces in accordance with manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
 - 2. Allow concrete to cure for a minimum of 28 days.
 - 3. Test concrete for moisture in accordance with ASTM D 4263 and, if necessary, F 1869.
 - 4. Abrasive blast surface to remove laitance and solid contaminants and to provide clean, sound substrate with uniform anchor profile.

5. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of to 8 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.
6. Fill holes, pits, voids, and cracks with manufacturer approved surfacer.
7. Ensure surfaces are clean, dry, and free of oil, grease, chalk, form release agents, and other contaminants.

B. Exterior and Interior Dry:

1. Prepare concrete surfaces in accordance with manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
2. Allow concrete to cure for a minimum of 14 days.
3. Test concrete for moisture in accordance with ASTM D 4263 and, if necessary, F 1869.
4. Level concrete protrusions and mortar spatter.
5. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of to 8 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.
6. Fill hairline cracks less than 1/64 inch (0.4 mm) in accordance with manufacturer's instructions.
7. Prepare cracks wider than 1/64 inch (0.4 mm), moving cracks, gaps, and expansion joints in accordance with manufacturer's instructions.
8. Ensure surfaces are clean, dry, and free of oil, grease, chalk, form release agents, and other contaminants.

3.9 SURFACE PREPARATION OF CONCRETE FLOORS

- A. Prepare concrete surfaces in accordance with manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- C. Allow concrete to cure for a minimum of 28 days before coating.
- D. Test concrete for moisture in accordance with ASTM D 4263 and, if necessary, F 1869.
- E. Verify that the pH of the cleaned concrete surfaces to be coated is

within the range of to 8 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.

3.10 SURFACE PREPARATION OF SECONDARY CONTAINMENT

- A. Prepare secondary containment surfaces in accordance with manufacturer's instructions.
- B. Prepare concrete surfaces in accordance with manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
- C. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- D. Allow concrete to cure for a minimum of 28 days before coating.
- C. Test concrete for moisture in accordance with ASTM D 4263 and, if necessary, F 1869.
- D. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of to 8 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.

3.11 SURFACE PREPARATION OF POROUS CONCRETE MASONRY UNITS

- A. Prepare porous concrete masonry unit surfaces in accordance with manufacturer's instructions and SSPC-SP 13/NACE 6.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- C. Allow mortar to cure for a minimum of 28 days before coating.
- D. Level protrusions and mortar spatter.

3.12 SURFACE PREPARATION OF PLASTER

- A. Prepare plaster surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- C. Allow plaster to cure and dry out for a minimum of 28 days before coating.
- D. Do not coat over plaster containing free water, lime, or other soluble alkaline salts.
- E. Remove plaster nibs and other protrusions.
- F. Patch voids and cracks with approved materials and after dry, sand flush with

surface.

3.13 SURFACE PREPARATION OF GYPSUM BOARD

- A. Prepare gypsum board surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
- C. Sand joint compound smooth and feather edge.
- D. Avoid heavy sanding of adjacent gypsum board surfaces, which will raise nap of paper covering.
- E. Do not apply putty, patching pencils, caulking, or masking tape to drywall surfaces to be painted.
- F. Lightly scuff-sand tape joints after priming to remove raised paper nap. Do not sand through primer.

3.14 SURFACE PREPARATION OF WOOD

- A. Prepare wood surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, surface deposits of sap or pitch, and other contaminants.
- C. Seal knots and pitch pockets.
- D. Sand rough spots with the grain.
- E. Fill cracks and holes with approved materials after primer is dry. Sand flush with surface when filler is hard.
- F. Lightly sand between coats.

3.15 APPLICATION

- A. Apply coatings in accordance with manufacturer's instructions.
- B. Mix and thin coatings, including multi-component materials, in accordance with manufacturer's instructions.
- C. Keep containers closed when not in use to avoid contamination.
- D. Do not use mixed coatings beyond pot life limits.
- E. Use application equipment, tools, pressure settings, and techniques in accordance with manufacturer's instructions.

- F. Uniformly apply coatings at spreading rate required to achieve specified DFT.
- G. Apply coatings to be free of film characteristics or defects that would adversely affect performance or appearance of coating systems.
- H. Stripe paint with brush critical locations on steel such as welds, corners, and edges using specified primer. Apply and additional strip coat of the intermediate coating material in immersion areas.
- I. Roll or backroll the first coat of epoxy or block filler applied to concrete or interior block substrates to work the material into the substrate.

3.16 REPAIR

- A. **Materials and Surfaces Not Scheduled To Be Coated:** Repair or replace damaged materials and surfaces not scheduled to be coated.
- B. **Damaged Coatings:** Touch-up or repair damaged coatings. Touch-up of minor damage shall be acceptable where result is not visibly different from adjacent surfaces. Recoat entire surface where touch-up result is visibly different, either in sheen, texture, or color.
- C. **Coating Defects:** Repair in accordance with manufacturer's instructions coatings that exhibit film characteristics or defects that would adversely affect performance or appearance of coating systems.

3.17 FIELD QUALITY CONTROL

- A. **Required Inspections and Documentation:**
 - 1. Verify coatings and other materials are as specified.
 - 2. Verify surface preparation and application are as specified.
 - 3. Verify DFT of each coat and total DFT of each coating system are as specified using wet film and dry film gauges.
 - 4. **Coating Defects:** Check coatings for film characteristics or defects that would adversely affect performance or appearance of coating systems.
 - a. Check for holidays on interior steel immersion surfaces using holiday detector.
 - 5. **Report:**
 - a. Submit written reports describing inspections made and actions taken to correct nonconforming work.
 - b. Report nonconforming work not corrected.

c. Submit copies of report to Engineer and Contractor.

B. **Manufacturer's Field Services:** Manufacturer's representative shall provide technical assistance and guidance for surface preparation and application of coating systems.

3.18 CLEANING

A. Remove temporary coverings and protection of surrounding areas and surfaces.

3.19 PROTECTION OF COATING SYSTEMS

A. Protect surfaces of coating systems from damage during construction.

3.20 ONE-YEAR INSPECTION

A. Owner will set date for one-year inspection of coating systems.

B. Inspection shall be attended by Owner, Contractor, Engineer, and manufacturer's representative.

C. Repair deficiencies in coating systems as determined by Engineer in accordance with manufacturers instructions.

3.21 SCHEDULES

A. **Coating System Schedule:**
 Refer to the drawings for coating system schedules.

B. **Color Schedule:**
 To facilitate identification of piping in plants and pumping stations the following color scheme shall be utilized:

Raw Sludge Line	Brown with black bands
Sludge recirculation suction line	Brown with yellow bands
Sludge draw off line	Brown with orange bands
Sludge recirculation discharge line	Brown
Sludge gas line	Orange (or red)
Natural gas line	Orange (or red) with black bands
Nonpotable water line	Blue with black bands
Potable water line	Blue
Chlorine line	Yellow
Sulfur dioxide	Yellow with red bands
Sewage (wastewater) line	Gray
Compressed air line	Green

Water lines for heating	Blue with 6-in. red band on 30-in. centers
Fuel oil/diesel	Red
Plumbing drains and vents	Black
Polymer	Purple

In situations where two colors do not have sufficient contrast to easily differentiate between them, a six-inch (6") band of contrasting color shall be on one of the pipes at approximately 30 inch (30") intervals. The name of the liquid or gas shall also be on the pipe. Provide arrows indicating the direction of flow.

END OF SECTION

SECTION 11290

CENTRIFUGAL PUMPS AND CONTROLS

1.01 Location

This contract includes installation of a booster pumping station, located as noted on the PLANS.

1.02 WORK Included

The CONTRACTOR shall furnish all materials and provide all labor for construction and installation of pumps and controls for one (1) above ground water booster station as shown on the PLANS and as specified herein. The booster station pumps and related equipment shall be as represented by Straeffer Sales and Service, Inc., or approved equal.

1.03 Booster Pumps

The Contractor shall furnish and install two (2) vertical in-line multi-stage centrifugal pumps. Each pump shall deliver four hundred fifty-six (456) gallons per minute at two hundred eight (208) feet total dynamic head at a minimum efficiency of seventy five percent (75%). Each pump shall be driven by a 40 horsepower, 3/60/460 volt TEFC motor. Pumps shall be Grundfos model CR(E) 90-2 or approved equal.

1.031 Vertical In-Line Multi-Stage Centrifugal Pumps

- A. The head-capacity curve shall have a steady rise in head from maximum to minimum flow within the preferred operating region. The shut-off head shall be a minimum of 20% higher than the head at the best efficiency point.
- B. All pump bearings shall be lubricated by the pumped liquid.
- C. The pumps shall be Grundfos Model **CR 90-2**
- D. Large In-line Vertical Multi-Stage Pumps shall have the following features:
 - 1. Each pump shall be designed for in-line installation requiring no more than 2.5 square feet of floor space (including motor).
 - 2. The pump impellers shall be secured directly to the smooth pump shaft by means of a split cone and nut design.
 - 3. The suction/discharge base shall have ANSI Class 125 or Class 250 flange connections in a slip ring (rotating flange) design as indicated in the drawings or pump schedule.
 - 4. Pump Construction.

a. Suction/discharge base, pump head	Ductile Iron (ASTM 65-45-12)
b. Shaft couplings, flange rings	Ductile Iron (ASTM 65-45-12)
c. Shaft	431 Stainless Steel
d. Motor Stool	Cast Iron (ASTM Class 30)
e. Impellers, diffuser chambers, outer sleeve	304 Stainless Steel
f. Impeller wear rings	304 Stainless Steel
g. Intermediate Bearing Journals	Tungsten Carbide
h. Intermediate Chamber Bearings	Leadless Tin Bronze
i. Chamber Bushings	Graphite Filled PTFE
j. O-rings	EPDM

5. The shaft seal shall be a single balanced metal bellows cartridge with the following construction:

a. Bellows	904L Stainless Steel
b. Shaft Sleeve, Gland Plate, Drive Collar	316 Stainless Steel
c. Stationary Ring	Carbon
d. Rotating Ring	Tungsten Carbide
e. O-rings	EPDM

6. Shaft seal replacement shall be possible without removal of any pump components other than the coupling guard, motor couplings, motor and seal cover. Pumps with motors equal to or larger than 100 hp (one hundred horsepower) shall have adequate space within the motor stool so that shaft seal replacement is possible without motor removal.
7. The maximum working temperature shall be 250 degrees F. The maximum working pressure shall be 232 psig or 362 psig as determined by the installation requirements.

1.032 Motors

- A. Motors are to be provided with the following basic features:

1. Motors shall be premium efficiency, rated for operation with a variable frequency drive.
2. Motors shall be designed for continuous duty operation, NEMA design B with a 1.15 S.F.
3. Totally Enclosed Fan Cooled Motors are to be furnished with class "F" insulation. Open Drip Proof Motors are to be furnished with class "B" insulation.
4. Motor nameplate shall be mounted on enclosure with stainless steel fastening pins. Nameplate shall have, as a minimum, all information as described in NEMA Standard MG 1-20.40.1.
5. Open Drip Proof (ODP) motors shall have drip covers.

6. Motors over 50 lbs shall having lifting provisions.
7. Motors shall have a NEMA C-Flange for vertical mounting.
8. Drive end bearings shall be adequately sized so that the minimum L10 bearing life is 17,500 hours at the minimum allowable continuous flow rate for the pump.

1.033 Warranty

- A. The warranty period shall be a non-prorated period of 24 months from date of start-up.

1.034 Execution

- A. Manufacturer's Pump Test

All pumps shall be tested at the factory prior to shipment to ensure the performance criteria as stated in these SPECIFICATIONS can be met. Evidence of such testing shall be made available at the request of the ENGINEER.

- B. Installation

1. Installation shall be in strict accordance with the MANUFACTURER'S instructions and recommendations in the locations shown on the Drawings.
2. Upon completion of the installation, the CONTRACTOR shall submit a certificate stating that the installation of the equipment is satisfactory, that the equipment is ready for operation.

- C. Start-up

1. After the pumps have been completely installed and wired, the contractor shall do the following:
 - a. Megger stator and power cables.
 - b. Check for proper rotation.
 - c. Check power supply voltage.
 - d. Measure motor operating load and no load current.
 - e. Check level control operation and sequence.
2. The CONTRACTOR shall furnish the services of the MANUFACTURER'S field service technician, who has

complete knowledge of proper operation and maintenance of the equipment, for a period of at least one (1) full day to inspect the installed equipment, perform field test runs to verify the flow meets the specified flow and head conditions in the field, and to provide instruction to the plant personnel. All pump operating settings, alarms, controls and shutdown devices shall be calibrated and tested during the field tests.

3. Pumps operating on a variable frequency drive (VFD) shall be tested at full operating speed, normal operating speed and minimum operating speed for the specified range of flow. During each test, the pump shall be run at each head condition for sufficient time to accurately determine discharge, head, power input, and efficiency.
4. If a pump performance does not meet the specified requirements, corrective measures shall be taken and field tests will be repeated at no additional cost to the OWNER.
5. At least four (4) hours shall be allocated solely to instruction of plant personnel in operation and maintenance of the equipment. The instruction period shall be scheduled at least 10 days in advance with the OWNER and shall take place prior to start up and acceptance by OWNER. The final copies of operation and maintenance manuals specified must be delivered to the ENGINEER prior to scheduling the instruction period with the OWNER.
6. The VFD and electric control system shall be test operated for proper functioning prior to the pump mechanical test. The control system shall be checked out using simulated operating signals as per pump MANUFACTURER'S recommendations.
7. The CONTRACTOR shall check direction of rotation of all motors and reverse connections if necessary.
8. The CONTRACTOR shall meet all the testing requirements of Division 16.

1.04 Control

Control of pump operation shall be provided by telemetry with backup provided by a twenty-four (24) hour timer.

Suction control of the pumping operation shall be provided by bellows type, snap action pressure switches. The switch action shall be actuated by a single brass bellows. Each switch assembly shall be complete with internal switches to cover the start or stop cycle. Each internal switch assembly shall be complete with internal switches to cover the start or stop cycle. Each internal switch shall be independently

adjustable so as to provide from 2.0/6.0 PSI to full scale control differential. Switches are to be provided to control the following functions.

A. Low suction cut-out, 0 to 150 PSI control range, Pump 1.

B. Low suction cut-out, 0 to 150 PSI control range, Pump 2.

A selector switch shall be provided to bypass the alternator and still allow automatic operation of either pump. A sensor switch shall be provided for timer-off-telemetry.

Two (2) four and one-half inch (4 ½") diameter pressure gauges shall be mounted adjacent to the suction control pressure switches for each pump.

Two (2) four and one-half inch (4 ½") diameter pressure gauges shall be mounted for sensing inlet pressure prior to the strainers and for discharge pressure.

Pressure switches and gauges shall be mounted in tandem, on a plate, as near to their respective pressure source as is practical. Switches and gauges will not be allowed within the electrical control panel. Hydraulic sensing lines shall be plumbed to the switches and gauges so the switch functions can be checked. All switch and gauge assemblies shall be complete with shut-off valve and pulsation dampener.

1.05 Adjustable/Variable Frequency Drives for Pumping Applications

A. General

1. Summary

- a. This section provides specification requirements for solid-state, pulse-width modulated (PWM) Adjustable Frequency Drives, herein referred to as AC Drives, for use with NEMA[®] design [NEMA A] [NEMA B] [NEMA D] [NEMA E] AC motors, or standard IEC motors.
- b. The AC Drive supplier shall furnish, field test, adjust and certify all installed AC Drives for satisfactory operation.
- c. Any exceptions/deviations to this specification shall be indicated in writing and submitted no less than one week prior to bid date.

2. References

- a. ANSI[®]/NFPA[®] 70 - National Electrical Code[®] (NEC[®]).
- b. UL 508 - UL Standard for Safety Industrial Control Equipment.

- c. UL 508C - UL Standard for Safety Power Conversion Equipment.
- d. NEMA ICS7 : Industrial Control and Systems Variable Speed Drives
- e. CSA C22.2 No. 14-M91 : Industrial Control Equipment
- f. IEC 1800 : Adjustable speed Electrical power drive systems
- g. SEMI-F47: Voltage Ride Thru

3. Warranty

- a. An 18-month warranty shall be provided on materials and workmanship from the date of shipment.

4. Quality Assurance

- a. The manufacturer of the AC Drive shall be a certified ISO 14001 facility.
- b. The AC Drive and all associated optional equipment shall be UL Listed according to UL 508 C - Power Conversion Equipment. As verification, a UL label shall be attached on the nameplate.
- c. The AC Drive shall be designed, constructed and tested in accordance with applicable UL, CSA, IEC, NEMA, and NEC standards.
- d. Every power converter shall have serial number with traceability records maintained by the manufacture.

B. Products

1. Manufacturers

- a. The AC Drive shall be Square D, Telemecanique, Altivar 61 Series, Danfoss Series VLT Aqua or approved equal.

2. General Description

- a. The AC Drive shall convert the input AC mains power to an adjustable frequency and voltage.

- b. The input power section shall utilize a full wave bridge design incorporating diode rectifiers. The diode rectifiers shall convert fixed voltage and frequency, AC line power to fixed DC voltage.
- c. The output power section shall change fixed DC voltage to adjustable frequency AC voltage.
- d. The adjustable frequency drive package shall include input EMI/RFI filtering.
- e. The AC drive shall have a user interface (keypad) that presents information in plain English / Spanish / French text. The user interface shall include a Local / Remote button to switch between control at the terminal strip and the user interface (keypad). This button shall also switch between network control and the user interface (keypad). The keypad shall have Run and Stop keys and a manual speed potentiometer function.

3. Construction

- a. The AC Drive power converter shall be UL Plenum rated.
- b. All heat sink fans shall be accessible from the front and shall not require the removal of the AC drive power converter for fan replacement.
- c. All heat sink fans shall be cycled on only when required to cool the drive to maximize the life of the fan.
- d. The AC Drive shall have the an enclosure rating detailed below:

1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V:

IP 41 on top IP21 on all other surfaces, Type 1 with optional conduit kit.

75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V:

IP 41 on top, IP30 sides & front IP00 on bottom, Type 1 w/ optional conduit kit.

600 hp – 900 hp @ 380/480 V.

IP 41 on top, IP30 sides & front, IP00 on bottom

- e. When a Type 1 conduit entrance kit is required. The kit shall attach and be ground to the bottom of the AC drive and provide conduit landing for incoming line power cables, motor lead cable, control wiring, and network cabling.

4. Application Data

- a. The AC Drive shall be sized to operate a variable torque load.
- b. The speed range shall be from a minimum speed of 1.0 Hz to a maximum speed of 72 Hz.

5. Environmental Ratings

- a. The AC Drive shall meet IEC 60664-1 Annex A and NEMA ICS 1, UL, and CSA standards.
- b. The AC Drive shall be designed to operate in an ambient temperature from -10 to 50 °C (14 to 122 °F).
- c. AC Drives in Type 1 enclosures shall be designed to operate in an ambient temperature from -10 to 40 °C (14 to 104 °F).
- d. The storage temperature range shall be -25 to 65 °C (-13 to 149 °F).
- e. The maximum relative humidity shall be 95%, non-condensing.
- f. The AC Drive shall be rated to operate at altitudes less than or equal to 3300 ft (1000 m). For altitudes above 3300 ft (1000 m), the AC Drive should be de-rated per drive specifications.
- g. The AC Drive shall meet the IEC 60721-3-3-3M3 operational vibration specification.

6. Ratings

- a. The AC Drive shall be designed to operate at the input line voltage indicated on the equipment schedule.
- b. The AC Drive shall operate from an input frequency range of 60 Hz (\pm) 5%.
- c. The displacement power factor shall not be less than .98 lagging under any speed or load condition.
- d. The efficiency of the AC Drive at 100% speed and load shall not be less than 97%.

- e. The variable torque rated AC Drive over current capacity shall be not less than 110% for 1 minute.
- f. The output carrier frequency shall be randomly modulated about the selected frequency. The output carrier frequency of the AC Drive shall be selectable from 1 to 16 kHz, 12kHz nominal rating for 1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V. Selectable: 2.5 to 8 kHz, 2.5kHz nominal rating for 75-125 hp @ 200/240 V, 125-900 hp @ 380/480 V.

7. Protection

- a. Upon power-up, the AC Drive shall automatically test for valid operation of memory, loss of analog reference input, loss of communication, DC-to-DC power supply, control power and pre-charge circuit.
- b. The AC drive shall be rated for UL minimum short circuit currents per given horsepower rating.
- c. The AC Drive shall be protected against short circuits, between output phases and to ground.
- d. The AC Drive shall have under-voltage power-loss ride through performance per the SEMI F-47 voltage ride through standard and certified by a third party.
- e. The AC drive shall have a programmable ride-through function, which will allow the logic to maintain control for a minimum of one-second (60 cycles) without faulting.
- f. An auto restart function will provide selectable time for restart attempts after the fault has disappeared and other operating conditions permit the restart. The restart shall be performed by a series of automatic attempts separated by increasingly longer periods of time. This period of time shall be selectable.
- g. Upon loss of the analog process follower reference signal, the AC Drive shall be programmable to display a fault.
- h. The AC Drive shall have a solid-state UL 508C listed overload protective device and meet IEC 60947.
- i. The output frequency shall be software enabled to fold back when the motor is overloaded.
- j. There shall be three skip frequency ranges that can be programmed to a bandwidth of ± 2.5 Hz.

8. Adjustments and Configurations

- a. The AC Drive shall be capable of storing the configuration in the keypad.
- b. The acceleration and deceleration ramp times shall be adjustable from 0.05 to 999.9 seconds.
- c. The memory shall retain and record run status and fault type of the past eight faults.
- d. The software shall have an energy economy function that, when selected, will reduce the voltage to the motor when selected for variable torque loads. A constant volts/Hz ratio will be maintained during acceleration. The output voltage will then automatically adjust to meet the torque requirement of the load. Selectable volts/Hz ratio patterns does not meet specification, the function must be automatically optimized.
- e. The AC Drive shall have macro configurations for HVAC and pump applications, PID regulator set-up and network set-up.

9. Keypad Display Interface

- a. A keypad display interface shall offer the modification of AC Drive adjustments through a touch keypad. All electrical values, configuration parameters, I/O assignments, application and activity function access, faults, local control, and adjustment storage, and diagnostics shall be accessible.
- b. The AC Drive model number, torque type, software revision number, horsepower, output current, motor frequency and motor voltage shall be listed on the drive identification portion of the LCD display.
- c. The keypad display shall have password protection that allows the keypad to be locked out from unauthorized personnel.
- d. The keypad shall be capable of displaying I/O assignment and status.

10. Control Connections

- a. The control power for the digital inputs and outputs shall be 24Vdc.

- b. The internal power supply shall incorporate automatic current fold-back that protects the internal power supply if incorrectly connected or shorted. The transistor logic outputs will be current limited and will not be damaged if shorted.
- c. Removable terminal strips shall be used on all logic and analog signal connections In the power converter.
- d. Two voltage-free relay output contacts will be provided. One of the contacts will indicate AC Drive fault status. The other contact shall indicate a drive run status. These relays shall be configurable for other status indicators.
- e. The AC drive shall have a power removal logic input. The drive shall not allow the motor to operate until this input is closed. If this input is opened while the connected motor is running, the AC drive shall stop applying power to the motor. This power removal function shall be certified by an independent agency.
- f. The control section of AC drive shall be supplied separately if necessary with 24V DC, to keep the network communication always available even if the power supply is OFF.

11. Serial Communication

- a. The AC Drive shall have an integrated RJ45 port, selectable for Modbus or CanOpen.
- b. The AC drive shall have the capability for internal mounted communication card. The following protocols shall be the minimum available :

Industrial Installations	HVAC building Installations
- Ethernet TCP/IP	-Lonworks
- Modbus Plus	-BACnet
- FIPIO	-METASYS N2
- Profibus DP	-APOGEE FLN
- Device Net	
- InterBus-S	

12. Harmonic Mitigation

- a. Each drive shall include a combination of integrated filters and DC link reactors to provide effective harmonic mitigation equivalent to 3% impedance without requiring additional panel space.

B. Installation

1. Inspection

- a. Verify that the location is ready to receive work and the dimensions are as indicated.

2. Protection

- a. Before and during the installation, the AC Drive equipment shall be protected from water and site contaminants.

3. Installation

- a. Installation shall be in compliance with manufacturer's instructions, drawings and recommendations.
- b. The AC Drive supplier shall provide a representative to inspect the contractor's installation, test and start-up the AC Drive(s) furnished under this specification.

4. Start-Up

- a. The CONTRACTOR shall furnish the services of the MANUFACTURER'S field service technician, who has complete knowledge of proper operation and maintenance of the equipment, to inspect the installed equipment, perform field test runs to verify it functions properly, provide written certification of its performance and to provide instruction to the plant personnel.
- b. The VFD and electric control system shall be test operated for proper functioning prior to the pump mechanical test. The control system shall be checked out using simulated operating signals as per pump MANUFACTURER'S recommendations.

5. Documentation

- a. The AC Drive supplier shall supply a comprehensive bound instruction and installation manual that includes wiring diagrams, layout diagrams, and outline dimensions. This manual must be insertion in a shop manual supplied by the installing contractor.

1.06 Electrical Apparatus - Devices

Two (2) time-delay relays shall be provided to perform the following function:

- A. Low suction timer
- B. 24-hour backup timer

The time delay relays shall be solid state plug-in type. Interchangeability of the timers shall not disturb control wiring. Timers shall be provided with a red neon light to indicate timing cycle. The timers shall be adjustable.

Hands-off automatic switches shall be oil tight, three (3) position maintained and be located on the main control panel door and control the following circuits:

- A. Pump 1
- B. Pump 2
- C. Exhaust Fans
- D. Telemetry/Timer
- E. Alternator Bypass

Indicating lights to indicate equipment shall be oil tight, with a full voltage pilot light. Indicating lights shall be provided in colors and functions as follows:

- A. Red - Low Suction Pressure, Pumps 1 and 2
- B. Green - Pump 1 in Operation
- C. Green - Pump 2 in Operation
- D. Telemetry Operation
- E. Timer Operation

Name plates shall be furnished on all panels front mounted switches and lights. Name tags shall also indicate proper nomenclature of control panel internal parts.

END OF SECTION

SECTION 11500

REMOTE METER READING SYSTEM 5/8 X 3/4 Orion Radio Read Meter

1.01 Location

The remote meter reading system shall consist of all hardware's necessary to equip new meters such as to provide a complete functioning system complimentary to the existing 5/8 X 3/4 Orion Radio Read System.

- A. Transmitter / registers for all meters which are to be straight reading, permanently sealed, magnetic drive and which measures in U.S. Gallons. This unit is to be factory wired to the end cap assembly for maximum reliability with the end cap to be bottom mounted thru a drilled hole in the meter pit lid. This unit is to communicate with the interrogation device.

The transmitter shall use two (2) 3.6 V 2.4 Ahr Lithium batteries as a power source and said batteries shall be guaranteed for a minimum of seven (7) years from initiation of operation.

This unit shall be capable of providing optional leak detection when no tow hour window of no usage within a 24 hour period is detected. It shall also be capable of tampered detection such as a cut wire.

- B. Meter Reading Hardware shall include all necessary equipment to perform remote meter readings. The Water District already owns a lap top computer with appropriate mounting hardware for an outside antenna and mounting for the computer in meter reading vehicles.

The District already owns appropriate software to communicate with the new meter transmitters and provide accurate meter readings. The unit must notify the reader when a particular meter is not read with provisions for a reread of that meter. The software is compatible with the billing system currently used by the District such that the meter reading can be directly downloaded to the billing computer.

It shall be the responsibility of the provider of this additional meter system to provide compatibility of the furnished system with the software to be compatible with the existing billing software.

- C. Replacement Meters shall be Badger Recordall Bronze Disc meters (5/8" X 3/4") Model 25 which complies with ANSIA./AWWA Standard C700.

END OF SECTION

11500-1

SECTION 11900

SCADA SYSTEM WITH RADIO TELEMETRY

PART 1 GENERAL

1.01 Location

The work to be accomplished under this section shall consist of improvements to existing SCADA equipment for automatic operation of existing pumps located at the booster station as indicated on the plans. It shall maintain sufficient water in a remotely located tank as indicated. A second tank on a different pressure zone will also be monitored. Future additions to the operational strategy should be planned for utilizing the existing SCADA Master and Workstation at the Districts Water Office.

- (1) Ea. RTU-2700 with 80 ft tower South Fork Water Storage Tank
- (1) Ea. RTU-XXX with 80 ft tower South Fork Area Repeater

1.02 Scope of Work

The CONTRACTOR shall furnish all labor, hardware, software, panel wiring, conduit and appurtenances required; and install complete and ready for operation: Programming Logic Controller (PLC), radio, telemetry, and integration with the existing Supervisory Control and Data Acquisition (SCADA) system as shown on the Drawings and as specified herein. Work shall include start-up and testing of the new equipment and software, preparation of an Operations and Maintenance (O&M) manual and training for key personnel. It shall include all materials, apparatus and labor necessary to install, equip and place into operation the respective items shown or called for in the Contract Documents. Any apparatus, material and labor not hereinafter specifically mentioned or shown on the Drawings, which may be found necessary to complete or perfect any portion of the work in a substantial manner and in compliance with the requirements implied or intended in these Specifications or Drawings shall be furnished by the CONTRACTOR without additional compensation. This shall include all materials, devices or methods peculiar to the apparatus or system furnished and installed by the CONTRACTOR.

The system shall be based on the utilization for Programmable Logic Controllers (PLC) which are sold or distributed on a national basis through multiple distributors in various Cities throughout the State of Kentucky. Proprietary hardware/software products sold/provided via an exclusive territorial basis by only one entity/representative per area are specifically and unconditionally not acceptable.

Complete and detailed integration of equipment supplied under this contract with any existing equipment and/or all new equipment furnished herein as well as by other specific suppliers is required. The complete system shall be constructed with UL listed materials wherever applicable. The new SCADA hardware and associated modifications specified herein shall be the product of a manufacturer who can

demonstrate a proven track record of satisfactory experience in construction, furnishing, and maintenance of the product.

The SCADA system supplier shall be of identical equipment type and brand of the owner's existing telemetry equipment as built by HTI Inc, Horse Branch, Kentucky (270)-274-4632. All control hardware components, communications equipment, software, programming and control methods shall be completely compatible with the exiting system.

The SCADA system supplier will furnish the following services to the CONTRACTOR prior to acceptance by the OWNER, and to the OWNER after acceptance. All costs involved in these services shall be included. These services include:

- A. Coordinate shop drawings for other items, or equipment, as required to insure proper interface into the System.
- B. Furnish Instrumentation and SCADA System wiring diagrams reflecting all equipment approved for use on the project. The wiring diagrams will be used by the CONTRACTOR for installation of the equipment and wiring. All wires shall be tagged and labeled at both ends for quick identification.
- C. During construction, the SCADA SUPPLIER shall assist the CONTRACTOR, as necessary, to calibrate, test, and coordinate the installation of the System. If interrelated devices furnished by others do not perform properly when tested, the SUPPLIER shall use suitable test equipment to introduce simulated signals to and or measure signals from those devices as may be required to locate the source of trouble or malfunction. A written report regarding the results of such tests shall be furnished to the ENGINEER and CONTRACTOR. The report shall identify the measures needed to correct the installation.
- D. Services of a trained instrumentation and SCADA technician for:
 - One day, during construction, for consultation and assistance to the CONTRACTOR in planning and implementing the installation.
 - Two days, one trip, for start-up of the System. Startup services shall include checking, calibrating, and adjusting all equipment integrated into the System. The OWNER shall accompany the supplier during start-up services.
 - One day, one trip, following start-up to instruct the OWNER's personnel in the proper operation, adjustment, and maintenance of the System. Instructions may be video taped by the owner for future reference. The program shall include at least eight (6) clock hours of instruction for owner personnel, and shall cover at least the following topics:
 1. Preventive and scheduled maintenance for all equipment.

2. Programming and resetting set points and alarm conditions.
 3. Emergency maintenance and restoration procedures.
 4. PLC troubleshooting
 5. Radio troubleshooting and replacement.
- E. Operation and Maintenance Manuals will be furnished as specified in Division 1 shall be furnished to the ENGINEER for equipment supplied under this Section.

PART 2 PRODUCTS

2.01 General

A. Operational Description

The operation for the telemetry control system will include a Remote Terminal Unit (RTU-2700) at the new South Fork Water Tank. The existing KY 30E BPS RTU-1500 will communicate with / interrogate RTU-2700 to obtain water level data. South Fork tank level shall be transmitted to the MTU for graphical interface and data logging by the existing SCADA servers.

SCADA software tag count upgrade requirements for all SCADA workstations shall be included in the supplier's scope of work. The supplier shall assure all SCADA HMI and Autodial software is brought up to the latest revisions and shall be procured and installed under this project. All new I/O points and related control functions shall be included in the integration of related interface software for this project.

Operation of the Booster Pumps will be as follows:

RTU-1500 (KY 30 East BPS) logic will interrogate RTU-2700 (South Fork Tank) for water level and initiate a tank fill call at the operator entered start fill set points with the objective of maintaining the tank level within desired parameters.

Programming updates to the KY 30E BPS RTU and OIT shall be provided to incorporate the South Fork Tank level pump call sequence for automatic sequence. The operator shall have the option to select automatic operation of the pump calls based on either/or South Fork and Sugar Camp Tank levels. The selection shall be available via the KY 30E BPS local OIT and the water office SCADA work stations.

Existing pump control schemes shall remain at the KY30E BPS RTU with additions as noted above incorporated.

The SCADA system provider shall include (1) new tank level transmitter.

B. RTU-2700 Water Tank RTU (South Fork)

Local tank level value shall be displayed via the RTU's integral PLC digital display. A resolution of 1/10 foot of tank level shall apply

2.03 RTU PROGRAMMABLE CONTROLLER

PLC Hardware: Listed hardware is to establish basic major components only. Any required related ancillary devices shall be provided by the integrator at no additional cost to the owner.

- A. Manufacturer Allen-Bradley (No substitutions allowed)
- Water Tank RTUs: Micrologix 1100 series with required I/O
 - (As required) Communications cables

B. PLC General Specifications

The supplier shall provide a copy of all final working programs on CD ROM disks as well as a printed program listing. Ladder logic programming shall include detailed descriptions of I/O and internal bit/word functions.

1. Main Frame Hardware

The CPU shall be a self-contained unit, and will be capable of displaying Ladder Rung program execution through its communication port. The CPU will also control all I/O scanning and communications servicing.

The CPU within the system shall perform internal diagnostic checking and give visual indication to the when a fault is detected

The controller shall be designed to operate in a free air flow environment. (Convection cooling only, no fans or other air moving devices shall be required).

The main front panel of the packaged PLC shall include the following indicators:

- a. Power
- b. Run
- c. Fault
- d. Force

Processor mode shall be selected by a command from a programming device. Available settings must include "program", "run", and "test" modes.

RUN - No ladder edits possible, program always executing;
PROGRAM - Programming allowed, program execution disabled;
SINGLE SCAN TEST - The PLC scans and solves the user program once, does NOT control the real world outputs, and stops.
CONTINUOUS SCAN TEST - The PLC continuously scans the user program, but does not control the real world outputs

Non-volatile memory shall store the operating system, user program, and all user data information to protect against loss in the case of power loss or system shut-down.

2. Firmware:

The processor must support on site flash upgradeable firmware.

3. Power.

120 VAC, single phase, in power systems that operate on 50/60 Hz. The controller must also be available with an operating voltage of 12/24 VDC.

The onboard power supply must be capable of supplying all necessary power to all subsystems. (CPU, Memory, I/O, etc.) External power supplies must not be needed to provide power to controller circuitry.

The power supply shall provide surge protection, isolation, and outage carry-over of at least 1 cycle of the AC line.

At the time of power-up, the power supply shall inhibit operation of the processor and I/O modules until the DC voltages are within specifications.

4. Networking and Communications

The packaged controller shall support direct connection to a programming computer equipped with standard RS-232 serial ports Supporting DF1 and Modbus protocols. Native Ethernet I/P @ 10/100 MBPS shall also be supported.

The packaged controller shall support direct connection to a modem for remote programming functionality.

The packaged controller shall support full function peer to peer communications (program management, controller to controller messaging, etc.) over a network that supports a minimum of 32 devices.

The packaged controller family shall support connectivity with an industry standard "open" device level network.

The packaged controller shall support DF-1 full duplex point-to-point, DF-1 radio modem and Master or Slave ½ duplex communications on

a network capable of at least of 250 nodes. The ½ duplex network shall support program upload/download, monitoring, and peer to peer communications. The unit shall include store and forward and Masterless peer-to-peer support.

5. Interfacing and Peripherals.

The programming means shall be an IBM or compatible desktop/portable, or industrial quality programming terminal. Programming tools must be available that run on Windows XP and V7 32 Bit environments.

6. Programming Techniques.

The programming format shall be traditional relay ladder diagram. It shall be possible to program a maximum instruction matrix containing as many as 128 instructions.

7. Quality Requirements.

The packaged controller shall be able to withstand conducted susceptibility tests as outlined in:

Electrostatic Discharge	IEC801-2 @ 15KV
Radiated Susceptibility	IEC801-3 @ 10V/m, 27 MHz - 1000 MHz.
Fast Transient	IEC801-4 @ 2 KV Power Supply, 1KV I/O.
Isolation	1500 Vac, 250 Vdc continuous

Programming tools must be available that run on Windows 98/NT/2000/XP environments

The packaged controller and its associated peripherals shall be listed or recognized by the following registrations: UL listed, CSA and CE certified.

2.04 PUMP STATION RTU OPERATOR INTERFACE

Allen-Bradley PanelView Plus 400 or 600 with keypad . Serial and Ethernet communications (No substitutions allowed)

2.05 RADIO COMMUNICATIONS

Wireless communications shall be accomplished using licensed VHF radio modems. The integrator shall supply proper FCC licensing for the owner all sites and cover all associated fees. The supplier shall provide a computer generated radio path study to determine recommend antenna heights. The RF path study must be provided with bid. Radio path study results shall indicate requirements for communications towers where required. The towers shall be provided as recommend by the control system integrator and installed by the contractor. A tower with a minimum height of 80 ft shall be provided by the supplier and installed by the contractor. If the radio path study results indicate the need for additional height at this location, the SCADA supplier shall include this in the bid to the contractor. The supplier shall be

responsible for informing the contractor of proper locations and installation techniques of towers.

The contractor shall provide for an antenna mast on the new water tank and mount antenna as instructed by the supplier.

Antenna heights to be located at appropriate heights as noted in the computer path study for a fade margin of 20 dB at a RX threshold of 2.0 uv. An average foliage height of 85 ft shall be used in the RF path calculations.

A. Radio/Modem

ESTEEM 192M series (No substitutions allowed)

Note: 192MHP shall be provide at repeater sties

B. Antenna

Omni Directional: Celwave, Astron or approved equal

Yagi: Celwave, Astron or approved equal

(System gain an type as determined by path study and FCC requirements)

C. Coaxial Cable

Times Microwave: LMR-400DB with type "N" end connectors

D. Antenna Towers

Towers to be free standing "tilt up" type and constructed of high quality aluminum. Properly sized base section shall be provided with tower. Tower to be sized by integrator for adequate regional wind loading for antenna type used. Tower heights to be determined by integrators pre-bid radio path study. Towers to be as manufactured by Universal Tower Inc.

Any required permitting and fess shall be administrated by the owner.

2.06 PRESSURE SENSORS

A. Tank Level Measurement

1. Non-submerged locations, .25 % accuracy, 4-20 MA, 9-30 VDC, Stainless Steel NEMA 4X, Manufacture: Pressure Systems Inc. or approved equal.
2. Submerged/Wet locations, Submersible , Sealed sensor, .25 % accuracy, 4-20 MA, 9-30 VDC, Stainless Steel , Manufacture: Pressure Systems Inc. or approved equal

B. Pump Station inlet/outlet pressure

1. .25 % accuracy, 4-20 MA, 9-30 VDC, Stainless Steel NEMA 4X
2. Manufacture: Pressure Systems Inc. or approved equal

2.07 RTU ENCLOSURES

11900-7

A. Outdoor environment exposure:

24x24x10" minimum
NEMA 4, Painted Steel
Pad lockable handle required for outdoor units

Manufacture: Hoffman Concept or approved equal

B. Indoor:

24x24x10" minimum
NEMA 12, Painted Steel
Manufacture: Hoffman Concept or approved equal

Enclosures shall be supplied with adequate condensation protection. Condensation heaters shall include a integral thermostat. Outdoor enclosures shall include ventilation if required to accommodate component temperature specification limits. Enclosures mounted outdoors shall include an interior swing panel for mounting of push buttons, switches, displays, etc. No buttons, displays, switches, etc., shall be exposed directly to outdoor weather conditions.

2.08 SURGE PROTECTION

A. RTU Panel AC 120 VAC Supply:

MOV protection
Current capacity: 15Amp
Surge Current: 6.5 kA
PHYSICAL SPECIFICATIONS
Operating Temperature Range -40°C to 60°C
Storage Temperature Range -40°C to 90°C
Relative Humidity 0 to 95% non-condensing
Manufacture: MGC, Citel or approved equal

B. RTU Analog signals:

Analog I/O devices located outside of the RTU shall be surge protected in the RTU panel
Max. DC Operating Voltage DC 38.5V DC
Max. Surge Current 1kA
Max. Capacitance L-L: 53pf L-G: 73pf
STRIKE BREAKDOWN PER UL 497B
at 100V/μs 13.0V 48.6V
at 100V/s 10.5V 40.8V
PHYSICAL SPECIFICATIONS
Operating Temperature Range -10°C to 60°C
Storage Temperature Range -10°C to 90°C
Relative Humidity 0 to 95% non-condensing
Manufacture: MGC, Citel or approved equal

C. RTU Coax Surge Protection:

Bulkhead mount, NF-NF end connectors
Manufacture: Polyphaser , Citel

Model: IS-B50LN-C0 or approved equal

2.09 POWER SUPPLIES

A. 12 VDC:

7 Amp minimum continuous output rating @ 12 VDC
Adjustable output 11-13.5 VDC
DIN rail mountable
Manufacture: Allen-Bradley, Sola, Mean Well or approved equal

B. 24 VDC:

3 Amp minimum continuous output rating @ 24 VDC
DIN rail mountable
Manufacture: Allen-Bradley, Sola, Mean Well or approved equal

2.10 UNINTERRUPTIBLE POWER SUPPLY

RTU's shall be equipped with a battery backup system with voltage regulation. The backup time shall be 30 minutes minimum.

2.11 CIRCUIT BREAKER

The RTU shall be fitted with a UL listed DIN rail mounted circuit breaker. The circuit breaker shall disconnect the RTU panel from all outside AC voltage sources. Manufactured by Allen-Bradley, GE or approved equal

2.12 RTU PANEL WIRING

RTU panel wiring shall conform to high quality assembly standards. All components shall be UL listed where available. Panel wiring shall conform to standard color coding practices for easy identification. Color coding scheme shall be clearly stated on system drawings. All internal back plate wiring shall be in slotted wiring duct. Duct shall be neatly installed in vertical and horizontal runs. Duct installed at angles other than vertical or horizontal shall not be accepted. Exposed wiring shall only be acceptable where wiring transitions to the intended device or termination point. All exposed wiring crossing door panels or similar transitions shall be wrapped in plastic wire wrap or flexible duct.

Proper grounding practice for personnel and equipment protection shall apply. All field wiring shall terminate at DIN rail mounted terminal strips. Direct field termination to RTU devices shall not be allowed. Terminal strips shall be feed through type rated @ 600 V/ 20 Amp. All terminals and wiring shall be clearly marked using machine printed permanent making labels. Wires shall be clearly identified at termination points and clearly identified on system drawings.

Individually fused components shall be required for the following:

- A. PLC AC supply power
- B. DC power supplies AC supply power
- C. Radio/Modem Power supply DC output

- D. DC Loop power to analog devices

PART 3 EXECUTION

3.01 FINAL DOCUMENTATION

Upon system substantial completion, (3) copies of as built drawings shall be supplied to the engineer for assembly of Owner's project documentation. Documents that have not changed from the submittal process will not require resubmittal. Field corrected or hand written changes to documentation will not be acceptable for final documentation.

Documents to be included are:

- A. RTU panel drawings (Detailed wiring diagrams with termination points, panel component layout and identification)
- B. All related PLC and SCADA HMI project files with documentation
- C. PanelView screen shots, tag database and alarm triggers printout
- D. Project instrumentation calibration and configuration data sheets
- E. Radio signal strength and data quality report.

3.02 DEMONSTRATION & START-UP

- A. Inspect each System for conformity and compliance of materials, equipment and construction.
- B. Inspect each installation for conformity with manufacturer's recommendations. Correct any discrepancies or improper conditions.
- C. Loops: Check each loop from the end element to the respective control display. Include instruments, control devices, panels, termination cabinets, input/output cards and other devices in the loop to ensure proper operation.
- D. Maintain a test set of loops drawings. Document loop checks on the test set.
- E. Energize and verify correct operation of all components of each System. This operation includes verification of accuracy of all interconnecting wiring..
- F. Place System into operation including all System software, logic, and displays.
- G. Adjust all control loop components and parameters to provide stable control of System process.
- H. Check validity of all System alarm displays.

- I. Schedule inspection with Owner to approve and verify satisfactory compliance with this section.

3.03 SPARE INPUTS / OUTPUTS

Provide 25 percent spare capacity (minimum) on all inputs and outputs. Provide extra terminal blocks and extra I/O modules as required to meet this minimum. Where designated future, provide complete wired input/output circuit including programming and associated PLC I/O module. Future input shall also be displayed on graphic screens, denoted as future.

Electrical Components

All electrical circuit components, such as switches, relays, alternators, fuses, etc., shall be manufactured by Allen-Bradley or approved equal.

3.03 SPARE PARTS

Provide the following spare parts.

- (1) ea Complete set replacement fuses

3.04 FACTORY TEST

Before the equipment is shipped to the job site, the factory test shall be performed and recorded. The test shall occur in the supplier's facility. The test shall have a minimum duration of two days after the de-bugging phase.

3.05 FCC LICENCING

The system supplier shall be responsible for collecting all information, generation of all paper work, and paying all fees required obtaining a license on behalf of the Owner as applicable.

3.06 ADJUSTMENTS DURING WARRANTY PERIOD

The SCADA supplier shall supply "Factory" startup service and operator training as required insuring satisfactory operation. Subsequent trips to the job site to correct defects shall be made at no charge to the Owner during the warranty period.

3.07 WARRANTY

The control system manufacturer shall supply a one-year parts and labor warranty for all items supplied under this section as part of the control system. The warranty shall begin from the time of final completion and acceptance of the completed project. Damage incurred by acts of vandalism or acts of nature shall be excluded.

3.08 BASIS OF PAYMENT

The payment for the basic telemetry shall include all equipment and installation needed for the SCADA system.

END OF SECTION

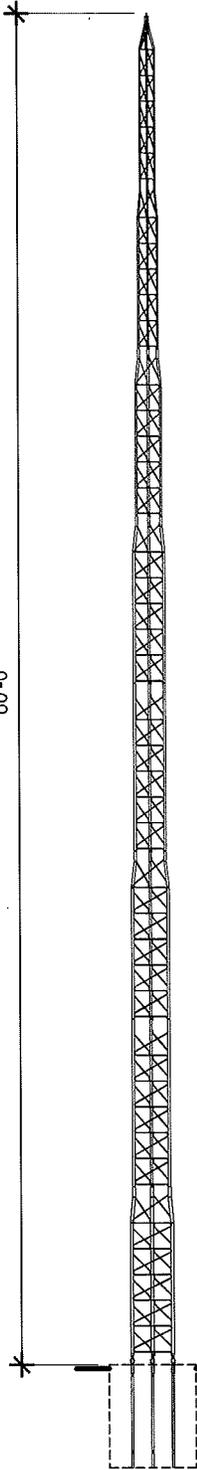
FREESTANDING ALUMINUM TOWER MODEL #HD 8-80

TOTAL WEIGHT: 283 LBS.

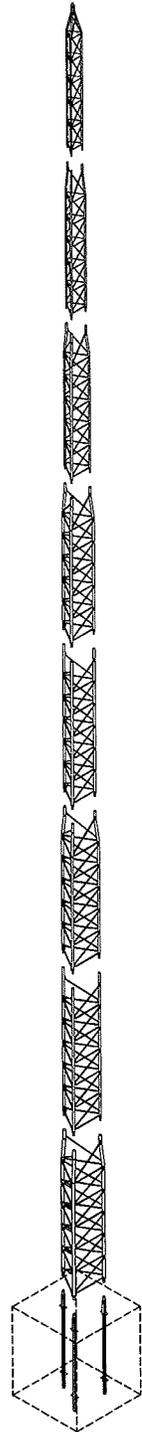
WIND LOADING:
7.27 Sq. Ft.

Contact Universal Towers to confirm
geographical location of your tower and
all wind load implications

80'-0"



- 11-TOP
- 14-TAPR
- 18-TAPR
- 22-TAPR
- 22-STRT
- 26-TAPR
- 26-STRT
- 30-TAPR
- B-30



WARRANTY

UNIVERSAL TOWERS ARE WARRANTED AGAINST DEFECTIVE MATERIAL OR WORKMANSHIP AND ARE SUBJECT TO REPAIR OR TO MATERIAL REPLACEMENT ONLY IF FAILURE RESULTS FROM THESE FACTORS WITHIN ONE YEAR FROM PURCHASE BY USER. THIS WARRANTY DOES NOT EXTEND TO ANY OF OUR PRODUCTS WHICH HAVE BEEN SUBJECTED TO MISUSE, NEGLIGENCE, ACCIDENT, IMPROPER INSTALLATION OR APPLICATION, NOR SHALL IT EXTEND TO UNITS WHICH HAVE BEEN REPAIRED OR SUBSTANTIALLY ALTERED OUTSIDE OF OUR FACTORY. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED.

ELEVATION

2

SCALE: 3/32"=1'=0"

ISOMETRIC

1

SCALE: N.T.S.

ALUMINUM TOWER

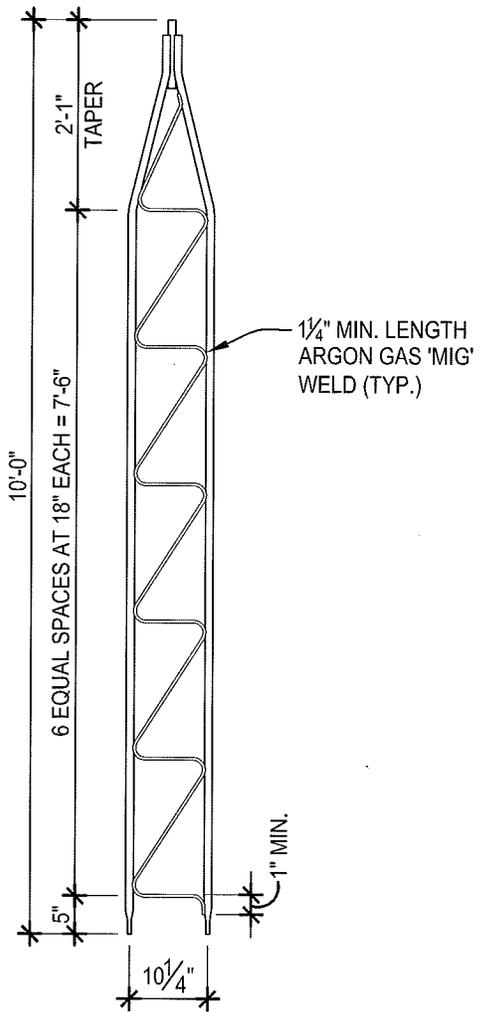


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43900 GROESBECK HWY.
CLINTON TOWNSHIP, MI 48036
PH: (586) 463-2560
FAX: (586) 463-2964

JOB NO.:

COMPONENT:

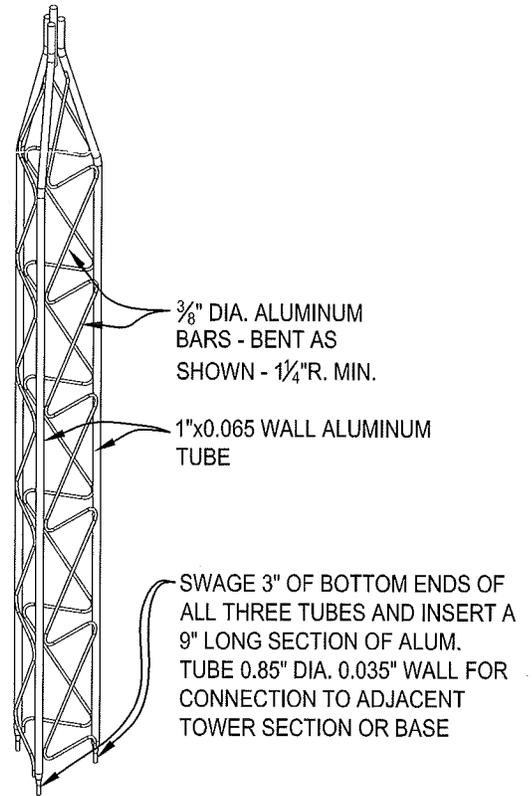
HD 8-80



ELEVATION

SCALE: 1/2"=1'-0"

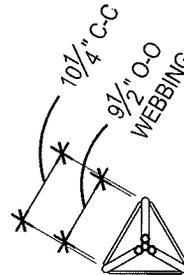
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ISOMETRIC

SCALE: N.T.S.

3



PLAN VIEW

SCALE: 1/2"=1'-0"

1

TOP SECTION

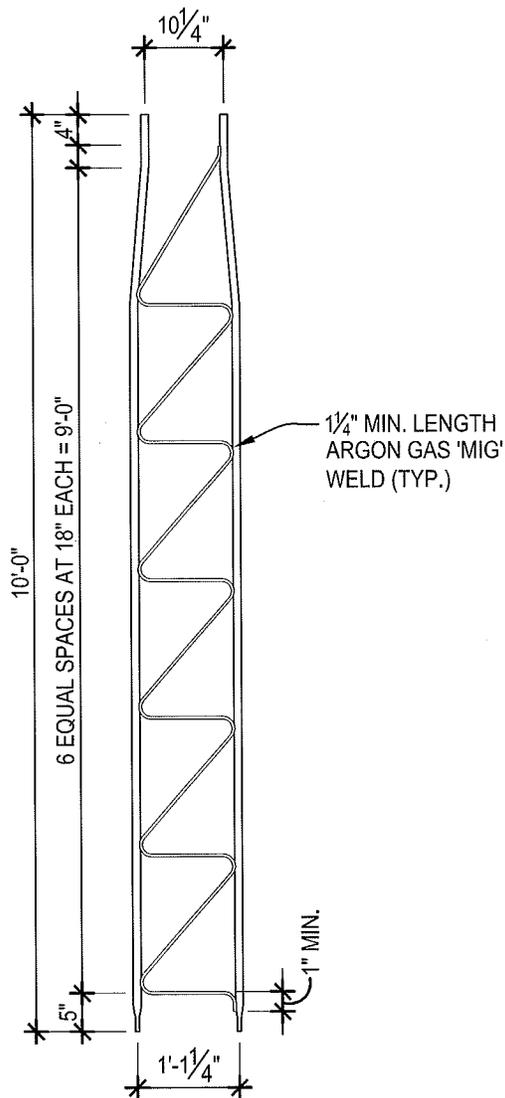


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COMPONENT:

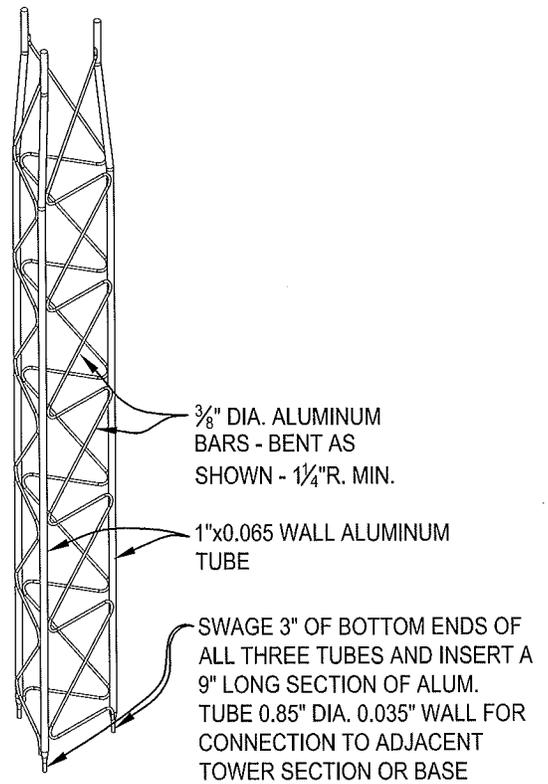
11-TOP



ELEVATION

2

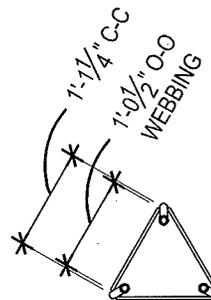
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ISOMETRIC

3

SCALE: N.T.S.



PLAN VIEW

1

SCALE: 1/2"=1'-0"

TAPERED SECTION

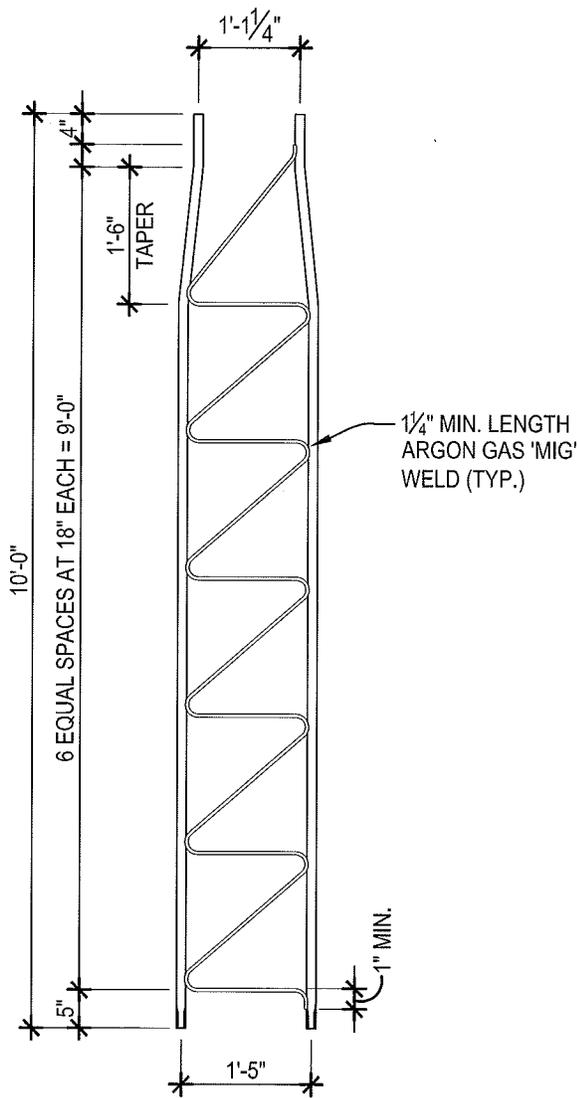


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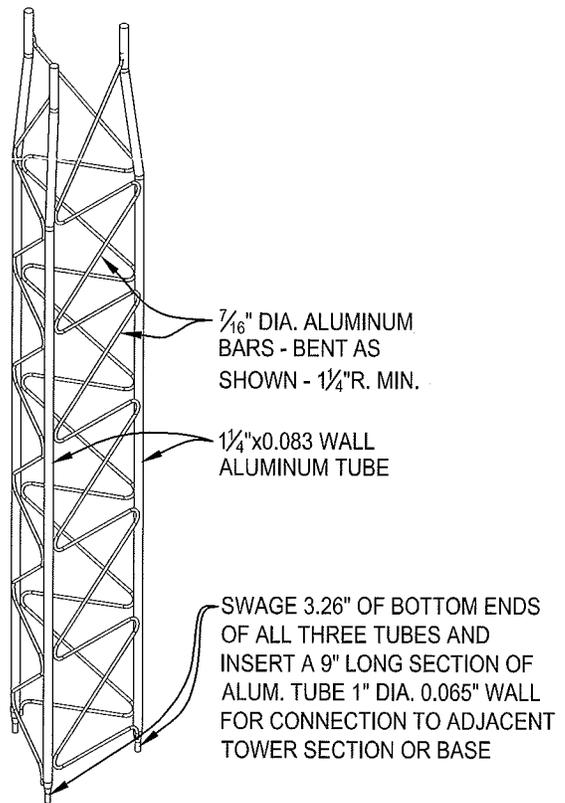
14-TAPR



ELEVATION

2

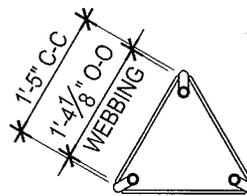
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ISOMETRIC

3

SCALE: N.T.S.



PLAN VIEW

1

SCALE: 1/2"=1'-0"

TAPERED SECTION

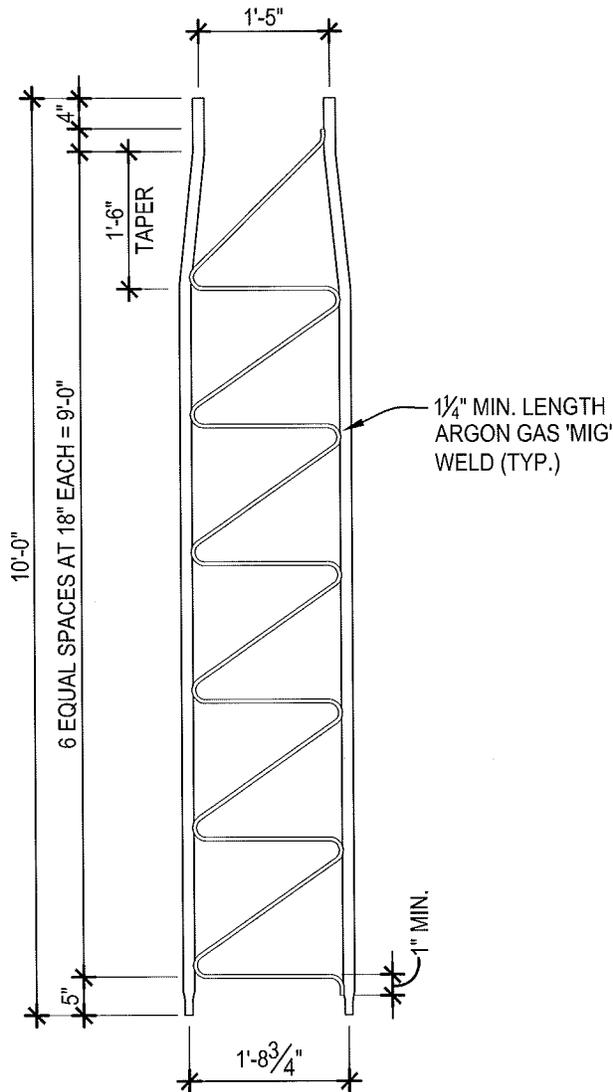


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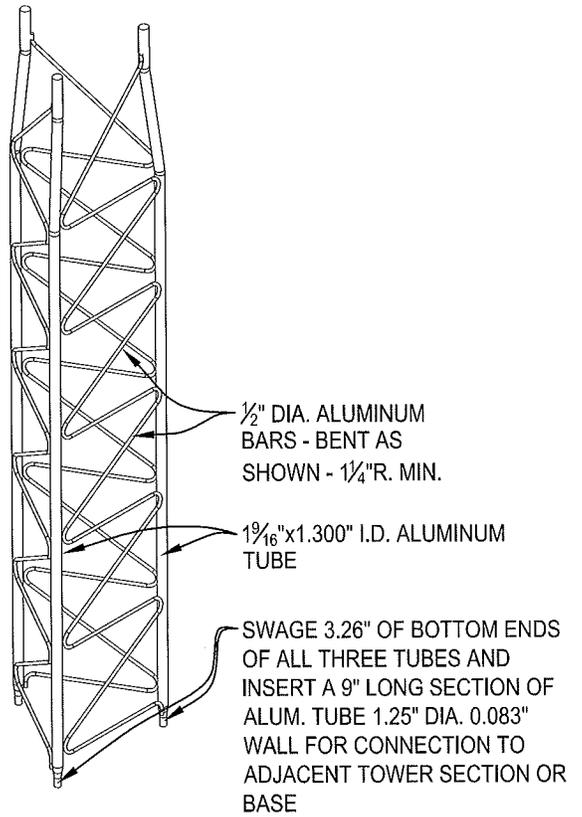
18-TAPR



ELEVATION

SCALE: 1/2"=1'-0"

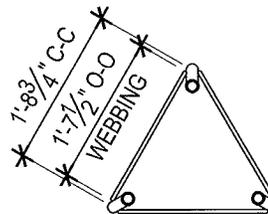
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ISOMETRIC

SCALE: N.T.S.

3



PLAN VIEW

SCALE: 1/2"=1'-0"

1

TAPERED SECTION

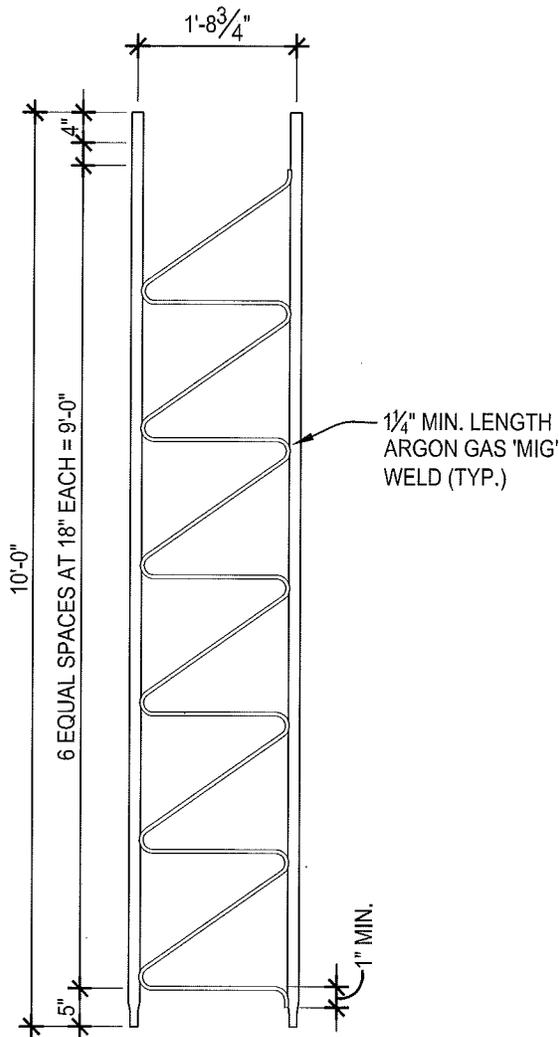


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COMPONENT:

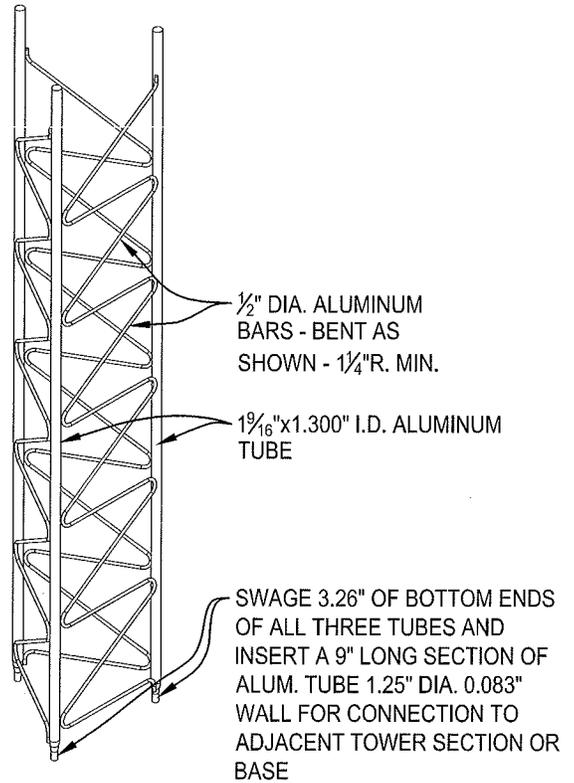
22-TAPR



ELEVATION

2

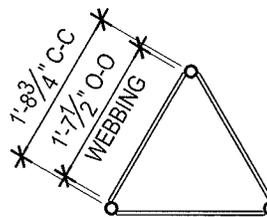
SCALE: 1/2"=1'-0"



ISOMETRIC

3

SCALE: N.T.S.



PLAN VIEW

1

SCALE: 1/2"=1'-0"

STRAIGHT SECTION

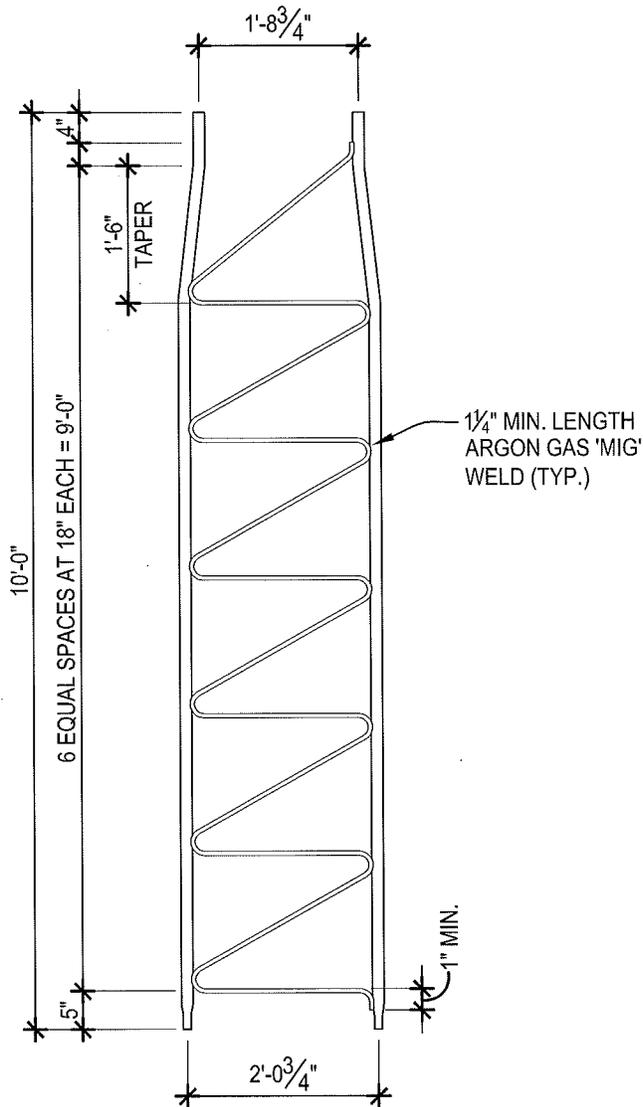


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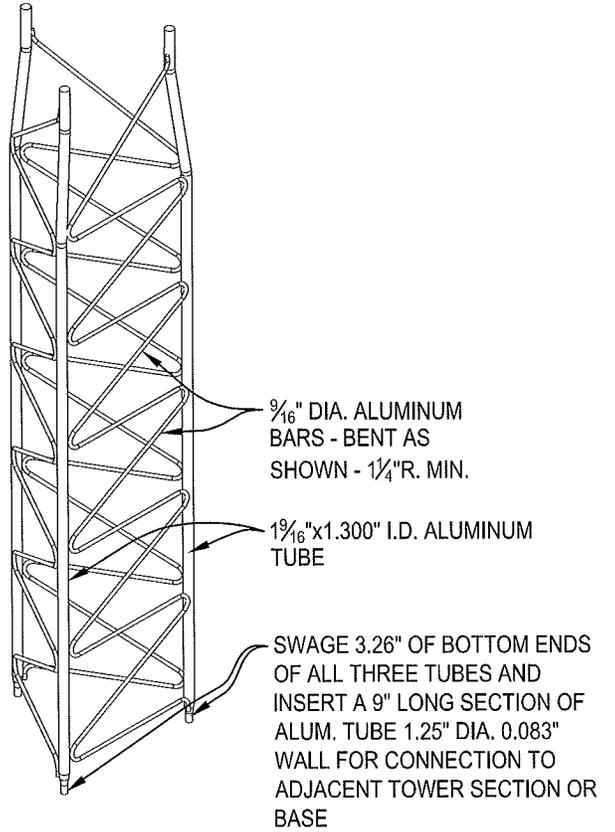
22-STRT



ELEVATION

2

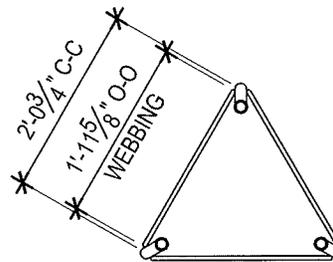
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ISOMETRIC

3

SCALE: N.T.S.



PLAN VIEW

1

SCALE: 1/2"=1'-0"

TAPERED SECTION

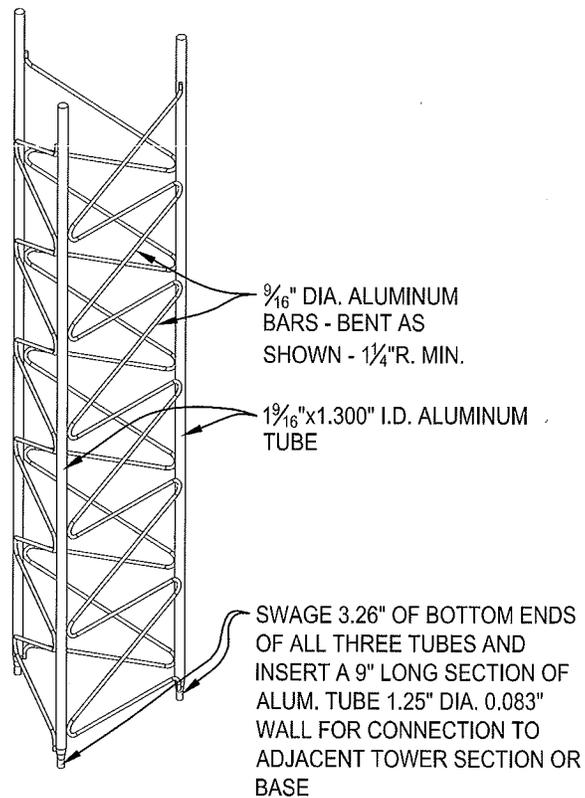
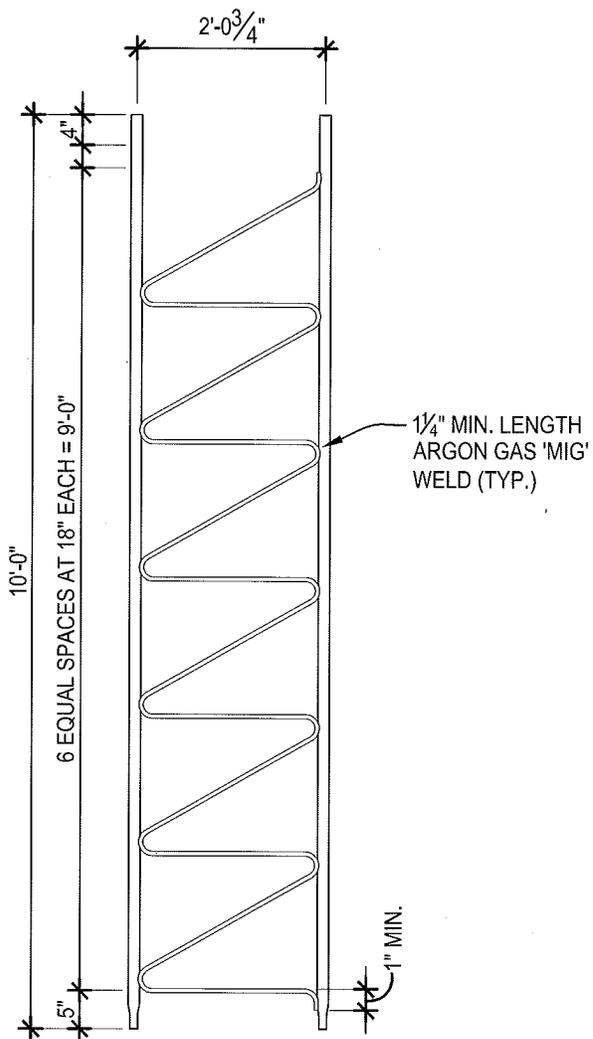


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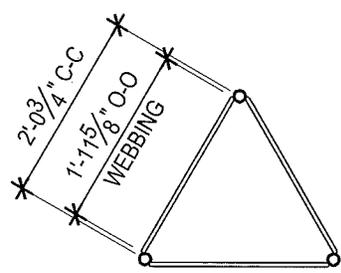
JOB NO.:

COMPONENT:

26-TAPR



ISOMETRIC 3
SCALE: N.T.S.



PLAN VIEW 1
SCALE: 1/2"=1'-0"

ELEVATION 2
SCALE: 1/2"=1'-0"

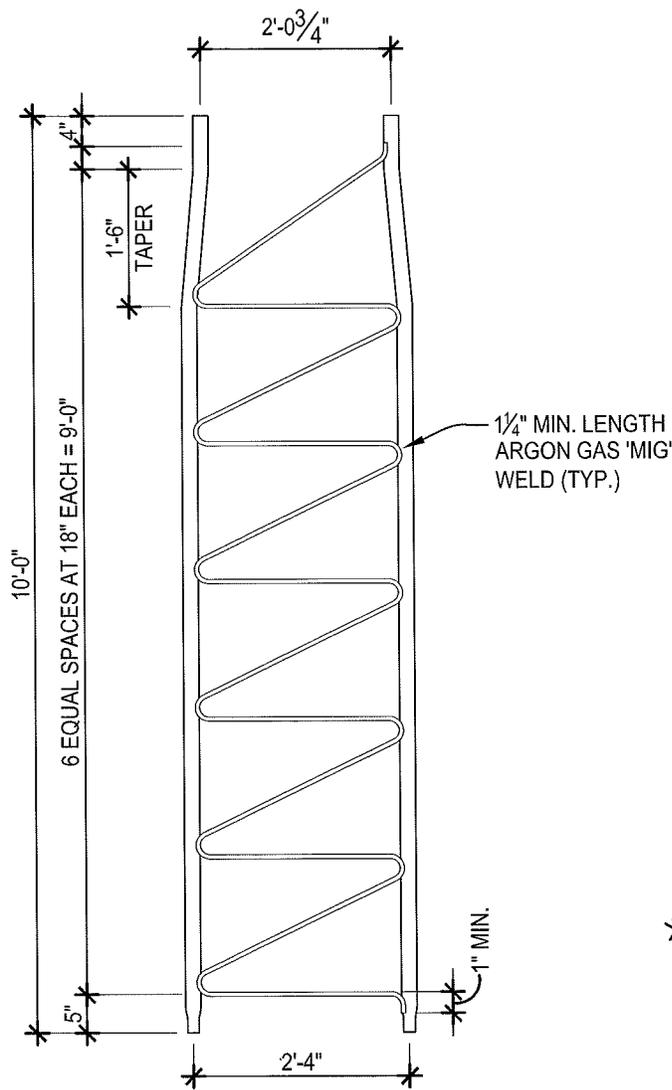
STRAIGHT SECTION



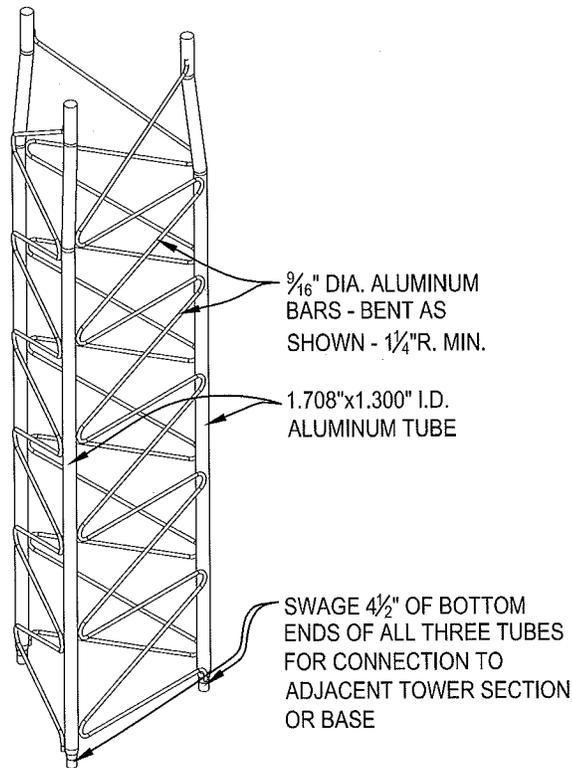
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JOB NO.:

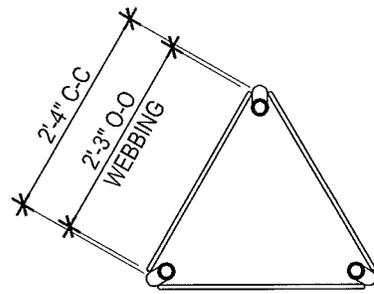
COMPONENT:
26-STRT



ELEVATION 2
SCALE: 1/2"=1'-0"



ISOMETRIC 3
SCALE: N.T.S.



PLAN VIEW 1
SCALE: 1/2"=1'-0"

TAPERED SECTION

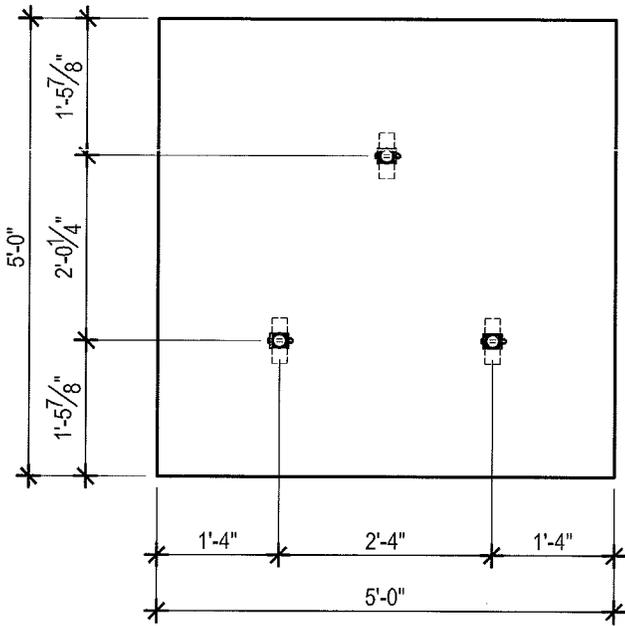


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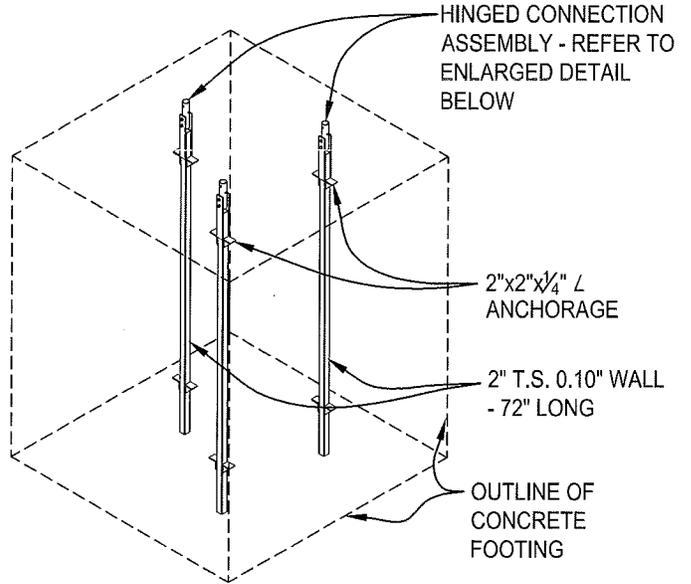
30-TAPR



PLAN VIEW

SCALE: 1/2"=1'-0"

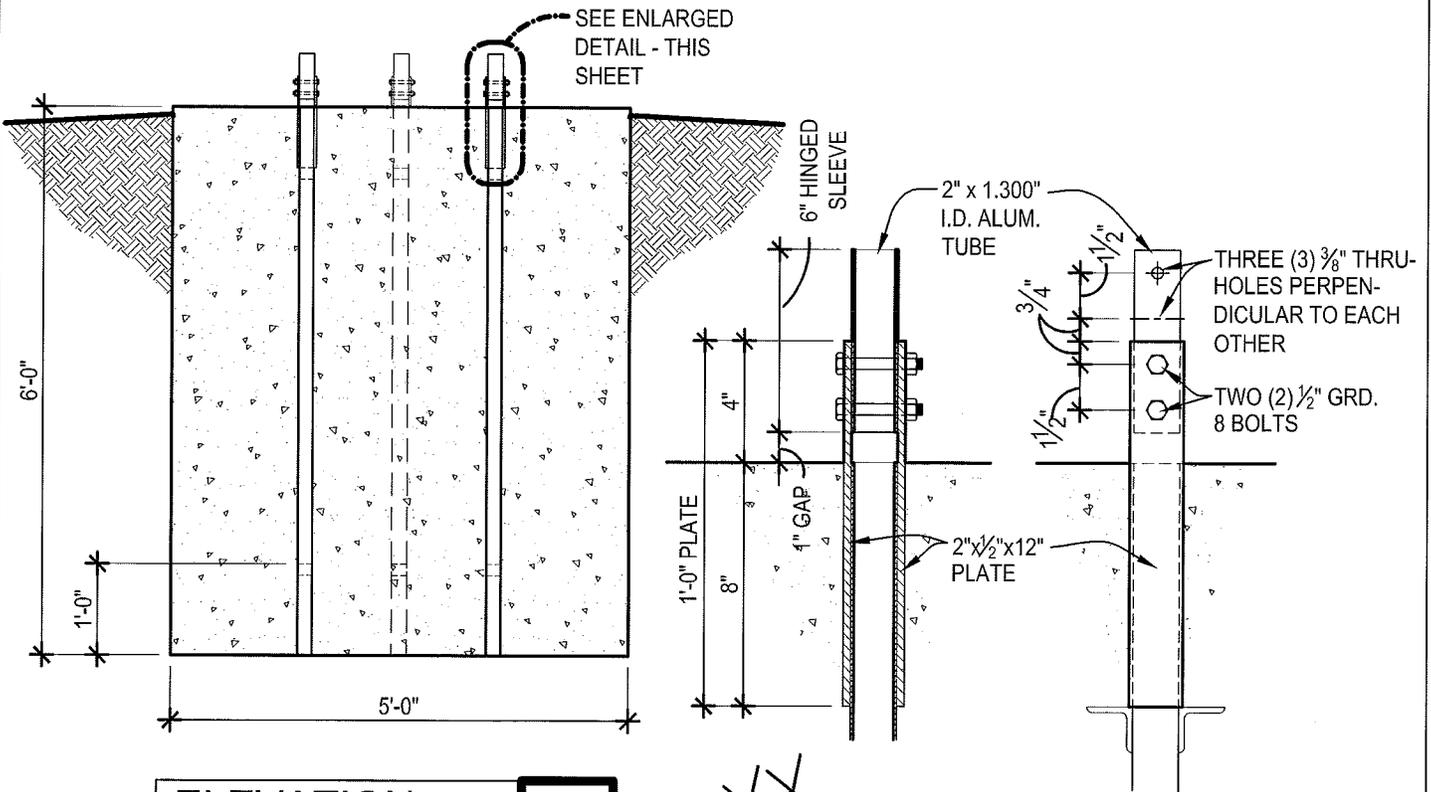
1



ISOMETRIC

SCALE: N.T.S.

3



ELEVATION

SCALE: 1/2"=1'-0"

2

NOTE: FOUNDATIONS ARE DESIGNED FOR FIRM BEARING SOIL.

BASE FOOTING

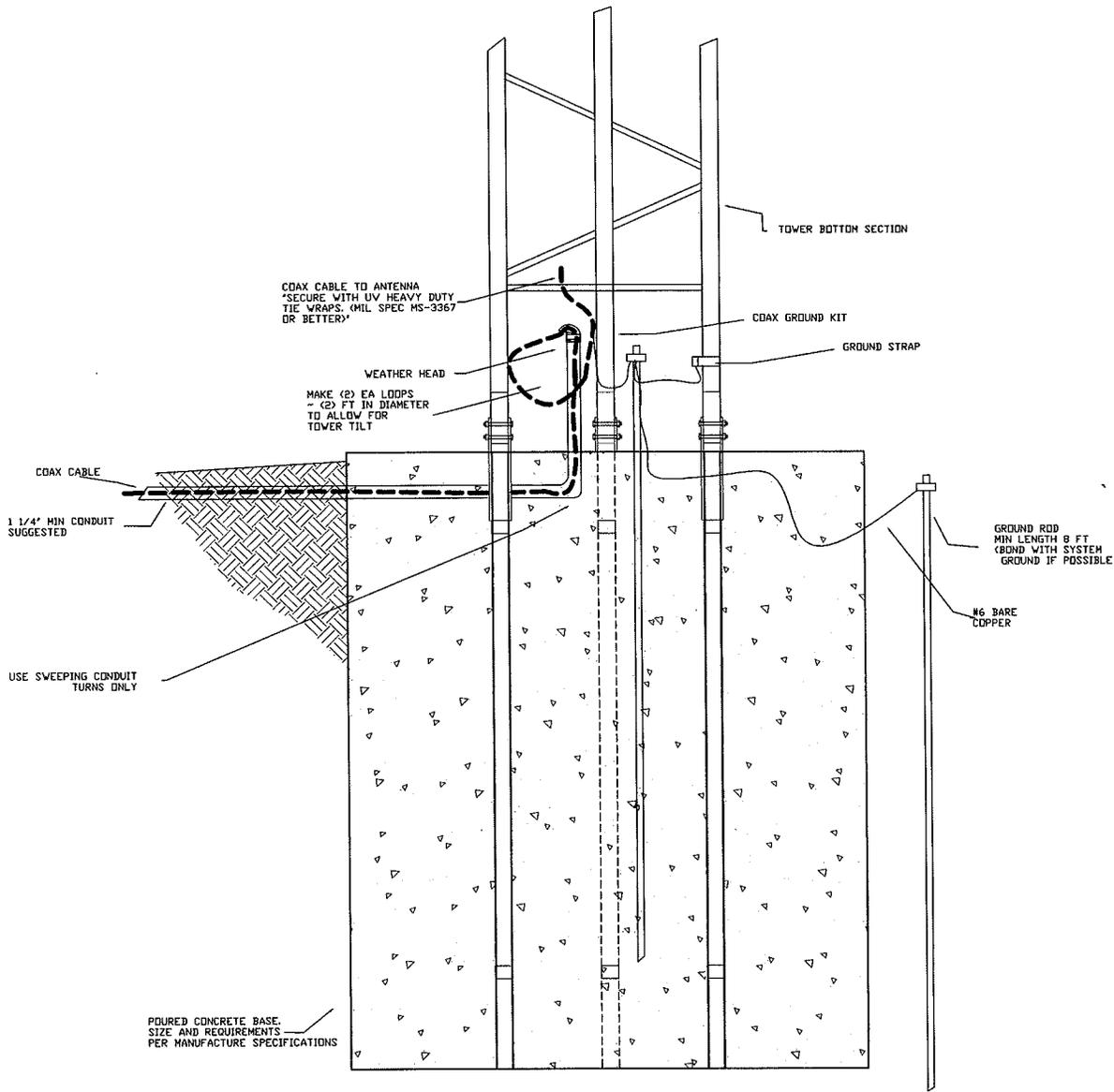


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JOB NO.:

COMPONENT:

B-30



SHEET NOTES:
 1. INFORMATION FOR REFERENCE ONLY. ALL LOCAL, STATE AND FEDERAL CODES SHALL SUPERCEDE NOTED DETAILS.
 2. REFER TO TOWER MANUFACTURE INSTALLATION DETAILS FOR INSTALLATION AND ERECTING REQUIREMENTS, INCLUDING BASE SIZE AND EXCAVATION REQUIREMENTS.

SECTION 15075

PIPING AND EQUIPMENT IDENTIFICATION

PART I GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Plastic pipe markers.
 - 2. Underground type plastic line marker.
 - 3. Valve tags.
 - 4. Plastic equipment markers.
 - 5. Piping system color coding schedule.
- B. Identification furnished as part of equipment is specified as part of equipment assembly in other sections and shall comply with requirements of this section.
- C. Refer to Division 16 sections for identification requirements of electrical and instrumentation work, not work of this section.
- D. Refer to Division 10 for identification and signage requirements of architectural work, not work of this section.

1.02 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 yrs.
- B. Regulatory Requirements:
 - 1. ANSI Standards: Comply with ANSIA13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

1.03 MAINTENANCE

- A. Extra Materials:
 - 1. Furnish minimum 5% extra stock of each mechanical identification material required, including additional numbered valve tags (not less than 3) for each piping system and additional piping system identification markers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Alien Systems, Inc.
- B. Brady (W.H.) Company, Signmark Division.
- C. Marking Services, Inc.
- D. Industrial Safety Supply Company, Inc.
- E. Seton Name Plate Corporation.
- F. Or equal.

2.02 MECHANICAL IDENTIFICATION MATERIALS

- A. Provide manufacturer's recommended products as specified for each application.
- B. Where more than single type is specified for application, selection is installer's option, but provide single selection for each product category.
- C. Bands, markers, and identification materials used in mechanical rooms and process locations shall be rated for exterior application and suitable for withstanding occasional washdown.

2.03 LETTERING AND GRAPHICS

- A. Coordinate names, abbreviations, and other designations used in mechanical identification work with • corresponding designations shown, specified or scheduled. Provide numbers, lettering, and wording as-indicated or if not indicated, as recommended by manufacturers or required for proper identification and operation and maintenance of mechanical systems and equipment.
- B. Multiple Systems:" Where multiple systems of same generic name are shown or specified, provide identification indicating individual system number as well as service (i.e.. Boiler No. 3, Air Supply Unit No. 10-ASU-2, etc.).

2.04 PLASTIC PIPE MARKERS

- A. Snap-On Type: Provide preprinted, semi-rigid snap-on, color coded pipe markers complying with ANSIA13.1.
- B. Pressure Sensitive Type: Provide preprinted, permanent adhesive, color coded, pressure sensitive vinyl pipe markers complying with ANSI A13.1. Dot matrix printing is not acceptable.

- C. Small Pipes: For external diameters less than 6 in. (including insulation, if any), provide full band pipe markers, extending 360° around pipe at each location, fastened by 1 of following methods:
1. Snap-on application of pretensioned, semi-rigid plastic pipe marker.
 2. Adhesive lap joint in pipe marker overlap.
 3. Taped to pipe (or insulation) with color coded plastic adhesive tape not less than 4 in. wide, full circle at both ends of pipe marker, tape lapped 1-1/2 in.
- D. Large Pipes: For external dia 6 in. and larger (including insulation, if any), provide either full band or strip type pipe markers not narrower than 3 times letter height (and of required length), fastened by one of. following methods;
1. Taped to pipe (or insulation) with color coded plastic adhesive tape, not less than 4 in. wide, full circle at both ends of pipe marker, tape lapped 3 in;
 2. Strapped to pipe (or insulation) application of semi-rigid type with manufacturer's standard stainless steel bands.
- E. Lettering: Comply with piping system nomenclature as specified, scheduled or shown and abbreviate only as necessary for each application length, and only with approval of ARCHITECT/ENGINEER. Lettering height shall be as follows:

Outside Pipe Dia (in.)	Minimum Letter Height (in.)	Minimum Length of Marker (in.)
3/4 to 1-1/4	1/2	8
1-1/2 to 2	3/4	8
2-1/2 to 6	1-1/4	12
8 to 10	2-1/2	24
over 10	3-1/2	32

- F. Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system .service lettering (to accommodate both directions), or as separate unit of plastic.
- G. Label and band colors in accordance with ANSIA13.1, Pipe Identification Schedule Section 15200 and following:
1. Lettering and arrows:
 - a. Black on yellow background for inherently hazardous materials.

b. White on blue (gaseous) or green (liquid) for low hazard materials.

2. Banding: Colors and band spacing as scheduled or as shown on Drawings.

2.05 UNDERGROUND TYPE PLASTIC LINE MARKERS

A. Permanent, bright colored, continuous printed plastic tape, intended for direct burial service; not less than 6 in. wide by 4 mils thick. Provide tape with printing most

B. Provide multi-ply tape consisting of solid aluminum foil core between 2 layers of plastic tape.

2.06 VALVE TAGS.

A. Process Valve Tags: Fiberglass valve tags with printed embedded lettering; piping system abbreviation in approximately 3/16 in. high letters, valve numbers approximately 3/8 in. high, and 5/32 in. hole for fastener.

1. Provide 2-1/2 in. by 4 in. sq white tags with black lettering.

B. Valve Tag Fasteners: Solid brass chain (wire link or beaded type) or solid brass S-hooks of sizes required for proper attachment of tags to valves, manufactured specifically for purpose.

2.07 PLASTIC EQUIPMENT MARKERS

A. 2-ply, 1/8 in. thick laminated engraved plastic.

1. Color: Black letters on white background.

B. Nomenclature: Include following, matching terminology on schedules as closely as possible:

1. Equipment name (i.e., chilled water pump No. 1)

2. Equipment Tag No. (i.e. 30-P-1).

C. Size: Provide approximate 3 in. by 6 in. (minimum) for equipment.

1. 1 in. high letters for equipment tag number.

2. 1/2 in. high letters for descriptive equipment name.

PARTS EXECUTION

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3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Coordination: Where identification are to be applied to surfaces requiring insulation, painting or other covering or finish including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.02 PIPING SYSTEM IDENTIFICATION

- A. Locate pipe markers with arrows and color bands as follows wherever piping exposed to view in occupied ' spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums), and exterior non-concealed locations.
 - 1. Near each valve and control device.
 - 2. Near locations where pipes pass through walls or floors, ceilings or enter non-accessible enclosures.
 - 3. At access doors, manholes, and similar access points permitting view of concealed piping.
 - 4. Near major equipment items and other points of origination and termination.
 - 5. Spaced intermediately at maximum spacing of 30 ft along each piping run, except reduce spacing to 20 ft in congested areas of piping and equipment.
 - 6. On piping above removable acoustical ceilings, except omit intermediately spaced markers.
- B. Locate color bands at each marker and at intermediate spacing not to exceed 10 ft between bands, and at lesser spacing as indicated or as required by local codes.
- C. Locate directional arrows at each marker. Provide 2 arrows at each tee or branch fitting.
- D. Where piping is normally visible from more than 1 side, provide 2 or 3 labels and arrows spaced at 120 degree intervals around pipe in accordance with ANSI A13.1.
- E. Painting or Coating:
 - 1. Painting of piping, ductwork, and equipment is work of Section 09961.
 - 2. Colors listed are general. Colors shall match existing piping system color coding.

3. For piping scheduled to be color-coded, but not scheduled for complete painting (such as some plastic piping or aluminum jacked insulation) provide additional banding to represent background color. At each banding location provide following sequence:
 - a. 8 in. wide tape of scheduled pipe color.
 - b. 4 in. wide tape of scheduled band color.
 - c. 8 in. wide tape of scheduled pipe color.

3.03 UNDERGROUND PIPING IDENTIFICATION

- A. During backfilling/top soil placement of each exterior underground piping systems, install continuous underground type plastic line marker located directly over buried line at 6 to 8 in. below finished grade. Where multiple small lines buried in common trench and do not exceed overall width of 16 in., install single line marker. For tile fields and similar installations, mark only edge pipe lines of field.

3.04 PROCESS VALVE IDENTIFICATION

- A. Install engraved plastic marker or fiberglass tag at each process valve, gate, or flow control device as identified by P&ID tag numbers on Drawings.

3.05 MECHANICAL EQUIPMENT IDENTIFICATION

- A. Install engraved plastic equipment marker on or near each major item of mechanical equipment and each operational device, if not otherwise specified for each item or device. Provide signs for each unit having equipment tag number on Drawings or in Specifications.

3.06 ADJUSTING AND CLEANING

- A. Adjusting: Relocate any mechanical identification device visually blocked.
- B. Cleaning: Clean face of identification devices and glass frames of valve schedules.

3.07 FIELD QUALITY ASSURANCE

- A. Final Survey and Repairs:
 1. CONTRACTOR shall perform walk-through survey of mechanical identification systems and shall remove and replace any bands, labels, tags or markers that are loose, discolored, or defective.
 2. Replacement materials shall be provided by CONTRACTOR, not drawn from OWNER'S extra material.

Piping Identification Schedule				
Table 1 to Section 15075				
Flowstream Identifier	Background Label Color	Pipe Label Text	Pipe Color	Pipe Banding
WATER				
(W1) (Hot)	Green	Potable Water	Light Blue	---
NON-POTABLE WATER				
(W3)	Yellow	Final Effluent Water	Light Gray	Yellow
(W2)	Yellow	Non-Potable Water	Dark Blue	Yellow
AIR				
(V)	Yellow	Plumbing Vent	(Match wall color)	
FLAMMABLE GAS				
(G)	Yellow	Natural Gas	Orange	---
DRAINS & WASTE				
---	•Yellow Green	Sanitary Drain	Dark. Gray (Match wall color)	
---		Roof Drain		---

END OF SECTION

SECTION 15094

HANGERS AND SUPPORTS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals, and install pipe (and tubing), hangers, supports, beam clamps, hanger rods, turnbuckles, rings, friction clamps, concrete inserts, and anchor bolts including, in general, all hanging and supporting devices for supporting piping, tubing, and appurtenances. Supports shall be as specified herein or as acceptable to the ENGINEER.
- B. Unless otherwise noted, whenever the word "support" is used herein it shall mean any overhead hangers, wall bracket, supports from the floor, friction clamps and attendant beam clamps, concrete inserts, rods, support pipes, and other necessary equipment for supporting and/or anchoring any pipes, tubing, or appurtenances. Where the word pipe is used it shall refer to both new and existing valves, pipe, appurtenances, and tubing.
- C. Special supports shall be constructed in accordance with details shown on the DRAWINGS.

1.02 RELATED WORK

- A. Concrete is included in Division 3.
- B. Painting is included in Division 9
- C. Valves and appurtenances are included in this Division, Sections 15100 and 15101.
- D. Pipe and fittings are included in this Division, Sections 15060 and 15400.

1.03 DESCRIPTION OF SYSTEM

- A. All new and existing piping, tubing, valves, fittings, and appurtenances shall be properly and adequately supported and anchored so as to maintain the supported loads in proper position under all operating conditions without unnecessary movement or strain on any piece of equipment. There shall be no visible sagging between supports. Supports shall be approved standard design and in compliance within MSS-SP-58 and SP-69 and all government codes, where applicable.

All support of the same type shall be identified, varying only with size, and the product of one manufacturer or fabricator. Supports shall be provided, where

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required, and where acceptable to the ENGINEER to form a complete workable system. If other types of pipe support other than those specified are required, they shall be as acceptable to the ENGINEER. Perforated or solid strap iron and strap copper will not be permitted.

- B. The minimum working factor of safety for supports shall be a minimum of 5 based on the ultimate tensile strength of the material, assuming water filled pipe is being supported at the maximum spacing as specified.
- C. All pipe and appurtenances connected to equipment shall be supported in such a manner as to prevent any strain being imposed on the equipment. When manufacturers have indicated requirements that piping loads shall not be transmitted to their equipment, the CONTRACTOR shall submit written certification stating compliance.

1.04 QUALIFICATIONS AND RESPONSIBILITY

- A. The CONTRACTOR shall have the sole responsibility for proper permanent support and/or anchorage of the piping systems.
- B. Any reference to specific manufacturer or model number is for the purpose of establishing a quality or parameter for specification writing and is not be considered proprietary.

1.05 SUBMITTALS

- A. SHOP DRAWINGS shall be submitted to the ENGINEER for review in accordance with Division 1, Section 01300 and shall include dimensional and technical specifications for all piping to be furnished.
- B. A system schematic and loading calculations shall be submitted that shows the location types and maximum loads for each pipe support for all piping 3 inches in diameter or larger.
- C. Wherever exceptions to the SPECIFICATIONS are taken or substitute equipment is used, they shall be clearly defined by the CONTRACTOR in the Shop Drawing submitted.

PART 2 PRODUCTS

2.01 MATERIAL AND EQUIPMENT

- A. These SPECIFICATIONS call attention to certain features, but do not purport to cover all details of construction of the units.
- B. All the manufactured or fabricated items shall be fabricated in the manufacturer's or vendor's shop.

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- C. Supports and hangers shall be as manufactured by Grinnell, Elcen, or approved equal.
- D. Hangers and supports shall be spaced in accordance with ANSI B31.1.0 except that the maximum unsupported span shall not exceed ten feet (10') unless otherwise specified herein.

2.02 PIPE HANGERS AND SUPPORTS FOR METAL PIPE

- A. Suspended single pipes shall be supported by hangers suspended by steel rods from concrete inserts as follows:

1. Hangers

<u>Pipe Size, Inches</u>	<u>Grinnell Fig. No.</u>
Less than 1/2	138R
1/2 through 1	97C (coated)
1 through 4	104
4 through 24	590
Larger than 24	295

- 2. Hanger rods shall be machine threaded and the strength of the rod shall be based on rod diameter. Hanger rods shall be of carbon steel (except rods under and above water shall be stainless steel) and shall have the following minimum diameters:

<u>Pipe Size, Inches</u>	<u>Min. Rod Diameter, Inches</u>
Less than 2-1/2	3/8
2-1/2 through 4	1/2
4	5/8
6	3/4
8-12	7/8
14-16	1
18	1-1/8
20-30	1-1/4

- 3. Where applicable, concrete inserts for hanger rod sizes up to and including 3/4 inch diameter shall be continuous type slotted metal inserts designed to be used in ceilings, walls or floors before the concrete is poured, as manufactured by Unistrut Corp., Wayne, Michigan or approved equal. Series P3200 inserts shall be used where supports are parallel to the main slab reinforcement and Series P3300 where the supports are perpendicular to the main slab reinforcement. Spot inserts shall be Catalog No. P3245 or M24 or approved equal.

4. Unless otherwise shown on the DRAWINGS, concrete inserts for pipe hanger rods for pipes up to 8 inches shall be Grinnell "CB-Universal Concrete Insert" figure 282 or Richmond "Malleable Adjustable Insert," or approved equal. For pipes larger than 8 inches, inserts shall be Richmond "Rocket Insert," or approved equal. Extra reinforcing steel must be placed around inserts so that the load from the pipe will be distributed over a greater area.
 5. Turnbuckles shall be forged steel, Grinnell Figure 230, Elcen Figure B1, or approved equal.
- B. Wall or column supported pipes shall be supported by welded steel brackets such as Grinnell Figure 194, 195, and 199, or approved equal. Additional wall bearing plates shall be provided where required.
1. Where the pipe is located above the bracket, the pipe shall be supported by an anchor chair and U-bolt assembly supported by the bracket for pipes 4 inches and larger and by a U-bolt for pipes smaller than 4 inches. Anchor chairs shall be Carpenter & Patterson Figure No. 127, or approved equal. U-bolts shall be Grinnell Figure No. 120 and 137, or approved equal.
 2. Where the pipe is located below the bracket, the pipe shall be supported by hangers suspended by steel rods from the bracket. Hangers and steel rods shall be as specified above.
 3. Wall or column-supported pipes 2 inches and smaller may be supported by hangers such as Carpenter & Patterson Figures 74, 179, or 237, or approved equal.
- C. Floor-supported pipes 3 inches and larger in diameter shall be supported by either cast-in-place concrete supports or adjustable pipe saddle supports as directed by the ENGINEER. In general, concrete supports shall be used when lateral displacement of the pipes is probable (unless lateral support is provided), and pipe stanchion-type supports shall be used where lateral displacement of the pipes is not probable.
1. Each concrete support shall conform to the details shown on the DRAWINGS. Concrete shall be poured after the pipe is in place with temporary supports. Top edges and vertical corners of each concrete support shall have 1 inch bevels. Each pipe shall be secured on each concrete support by a wrought iron or steel anchor strap anchored to the concrete with cast-in-place bolts or with expansion bolts. Where directed by the ENGINEER, vertical reinforcement bars shall be grouted into drilled holes in the concrete floor to prevent overturning or lateral displacement of the concrete support. Unless otherwise directed by the ENGINEER, maximum support height shall be five feet (5').

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2. Concrete piers used to support base elbows and tees shall be similar to that specified above. Piers may be square or rectangular.
3. Each adjustable pipe saddle support shall be screwed or welded to the corresponding size 150-lb. companion flanges or slip-on welding flanges, respectively. Supporting pipe shall be of Schedule 40 steel pipe construction. Each flange shall be secured to the concrete floor by a minimum of 2 expansion bolts per flange. Adjustable saddle supports shall be Grinnell Figure No. 264, or approved equal. Where used under base fittings, a suitable flange shall be substituted for the saddle.
4. Floor-supported pipes less than 3 inches shall be supported by fabricated steel supports.

D. Vertical piping shall be supported as follows:

1. Where pipes change from horizontal to vertical, the pipes shall be supported on the horizontal runs within two feet (2') of the change in direction by pipe supports as previously specified herein.
2. For vertical runs exceeding fifteen feet (15'), pipes shall be supported by approved pipe collars, clamps, brackets, or wall rests at all points required insuring a rigid installation.
3. Where vertical piping passes through a steel floor sleeve, the pipe shall be supported by a friction type pipe clamp which is supported by the pipe sleeve. Pipe clamps shall be Grinnell Figure 261, or approved equal.

E. Unless otherwise noted on the DRAWINGS or in the SPECIFICATIONS, concrete anchors shall be Hilti Fastening Systems "KWIK-BOLT", ITT Phillips Drill Division "Wedge Anchor", Ramset "Trubolt Wedge Anchor" or approved equal. Where required by the DRAWINGS or SPECIFICATIONS, chemical grout-type anchors shall be Hilti "HVA Adhesive Anchor," Ramset "Chemset Chemical Anchors", or approved equal. Installation shall be in strict accordance with the manufacturer's recommendations which shall be available on the job site.

F. All rods, hangers, inserts, brackets, and components shall be stainless steel.

2.03 PIPE HANGER AND SUPPORTS FOR NON-METAL PIPE

- A. Single plastic pipes shall be supported by pipe supporters as previously specified herein.
- B. Multiple, suspended, horizontal plastic pipe runs, where possible, shall be supported by ladder-type cable trays such as the Electray Ladder by Husky-Burndy, the Globetray by the Metal Products Division of United States

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Gypsum, or approved equal. Ladder shall be of mild steel construction. Rung spacing shall be approximately 18 inches. Ladder-type cable trays shall be furnished complete with all hanger rods, rod couplings, concrete inserts, hanger clips, etc., required for a complete support system. Individual plastic pipes shall be secured to the rungs of the cable tray by strap clamps or fasteners such as Globe Model M-CAC, Husky-Burndy Model SCR, or approved equal. Spacing between clamps shall not exceed nine feet (9'). The cable trays shall provide continuous support along the length of the pipe.

- C. Individual clamps, hangers, and supports in contact with plastic pipe shall provide firm support but not so firm as to prevent longitudinal movement due to thermal expansion and contraction.
- D. Pipe supports shall be provided to support the vertical runs of all plastic pipes. The pipes shall be supported by means of a supporting framework suitably anchored into the floor or curbing. The vertical piping shall be suitably secured to horizontal support members connected at each end to vertical support members and spaced to provide a rigid installation.
 - 1. The complete supporting system shall be manufactured by the Unistrut Corporation, Globe-Strut as manufactured by the Metal Products Division of U. S. Gypsum, or approved equal.
 - 2. Vertical and horizontal supporting members shall be U-shaped channels similar to Unistrut Series P1000, or approved equal. Vertical piping shall be secured to the horizontal members by pipe clamps or pipe straps such as Unistrut Series P1100M and Series P2558, or approved equal. All components shall be of mild steel.
 - 3. The assemblies shall be furnished complete with all nuts, bolts, and fittings required for a complete assembly.
 - 4. The design of each individual framing system shall be the responsibility of the CONTRACTOR. SHOP DRAWINGS shall show all details of the installation, including dimensions and types of supports.

2.04 SPECIAL SUPPORTS

- A. Any required pipe supports for which the supports specified in this Section are not applicable shall be fabricated or constructed from standard structural steel shapes, concrete and anchor hardware similar to items previously specified herein, and shall be subject to the review of the ENGINEER.
- B. All parts of the supports shall be amply proportioned for all stresses that may occur during fabrication, erection, and operation.

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- C. Anchor bolts, nuts, sleeves, plates, washers, and other hardware are to be supplied and installed by the CONTRACTOR and shall be of ample size and number for their intended use and installed as recommended by the appropriate manufacturer.
- D. For plastic and other similar piping as noted, supports shall be free of burrs and shall include a suitable pliable support liner. They should also provide the maximum support contact with the pipe for a minimum length of 3 inches along the length of the pipe.

PART 3 EXECUTION

3.01 INSTALLATION

- A. All required piping, tubing fittings, valves, and appurtenances shall be rigidly supported from the structures by approved supports, hangers, inserts, or clamps with adequate provisions for expansion and contraction. Support shall be provided at, or near, changes in direction, hubs, joints, valves, appurtenances, branches, and elsewhere within three feet (3') of couplings in accordance with the manufacturer's recommendations, as shown on the DRAWINGS, and as specified with the following support spacings:

B. Horizontal Runs

<u>Type of Pipe</u>	<u>Maximum Support Spacing (Unless Otherwise Noted)</u>
Soil, waste drain, vent and other gravity pipe of any size below or in concrete (except concrete pipe)	5 ft
Metal tubing or any size, and any metal pipe 1-1/2 inch in diameter or smaller	6 ft.
Cast or ductile iron process	12 ft. with at least one support of 4 inch in diameter or larger
Plastic Pipe	3.5 feet or as directed by the ENGINEER
All other metal pipe	10 ft.
All other types of pipe	As above and directed by the ENGINEER

Additional supports and anchors where required, other than the type of pipe supports shown on the DRAWINGS, shall be the CONTRACTOR'S responsibility and as acceptable to the ENGINEER.

- C. All vertical pipes shall be supported at each floor or at intervals of minimum 10 ft., except at 3.5 ft. intervals of plastic pipe, and at all points necessary to ensure rigid construction by pipe collars or clamps that shall rest on floor sleeves, brackets, or wall rests.

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- D. Piping shall not be supported from other piping or from metal stairs, ladders, or walkways unless specifically directed by the ENGINEER. Piping shall be a minimum distance of 1-1/2 inches (flanges, or bells, 1 inch) from finished floors, walls or ceilings unless otherwise shown on the DRAWINGS, or specified. Where piping is installed on structural steel supports, blocking of pipe rolls shall be provided or arrest lateral pipe movement.
- E. Concrete inserts shall have faces flush with the exposed concrete face. Where dimensions correspond, inserts may be used as the support for the reinforced steel during the concrete pour. A waxed cardboard filler shall be placed in the insert to prevent concrete from flowing into the slot.
- F. Supports in contact with plastic and other piping, where noted, shall provide firm support but not so firm as to prevent longitudinal pipe movement due to thermal contraction and expansion. In addition, point loading shall be avoided for the above piping. Plastic pipe shall be securely anchored to continuous supports with U-bolts spaced at a maximum of four feet (4') long the pipe.
- G. Each section of pipeline shall be laid out and all connections (cemented, welded, screwed, flanged, couplings, etc.), made while the pipe is held in temporary supports. After completion of connections, the pipe may be clamped in position. When piping is correctly installed on its permanent supports, a temporary clamp or pipe may be loosened or removed with displacement of the pipeline.
- H. All pipe shall be anchored at locations and by methods acceptable to the ENGINEER. Special attention is drawn to the need to anchor plastic piping and metal tubing at every 90° and 45° elbow. All continuous pipe supports shall be anchored to the structure at a maximum of every five feet (5').

3.02 COATING

- A. After installation, all metal surfaces of pipe supports, anchors, rods, support pipes, brackets, nuts, bolts, washers, and other metal used shall be painted as specified in Division 9.

3.03 INSPECTION AND TESTING

- A. Hangers, supports, and anchors installed on the piping system shall operate satisfactorily as specified in Paragraph 1.03 during the testing of the respective pipe systems. The hangers, supports, and anchors shall maintain the pipelines in position without evidence of bending, sagging, warping, vibration or stress.

END OF SECTION

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SECTION 15100

SMALL PLUMBING VALVES, PLUMBING SPECIALTIES AND SERVICE ACCESSORIES

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnish all labor, materials, equipment, and incidentals required, and install complete and ready for operation, all valves and appurtenances as show on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Excavation, backfill and grading are included in Division 2
- B. Painting is included in Division 9, Section 09900.
- C. Electrical is included in Division 16.

1.03 SYSTEM DESCRIPTION

- A. All of the equipment and materials specified herein is intended to be standard for use in controlling the flow of wastewater, sludge, water, air or chemicals, depending on the applications.

1.04 QUALITY ASSURANCE

- A. All of the types of valves and appurtenances shall be products of well established firms who are fully experienced, reputable and qualified in the manufacture of the particular equipment to be furnished. All materials of construction shall be of an acceptable type and shall be designated for the pressure and temperature at which they are to be operated, for the materials they are to handle and for the use for which they are intended. The materials shall meet established technical standards of quality and strength necessary to assure safe installations and conform to applicable standards. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these Specifications as applicable.

1.05 REFERENCES

- A. Kentucky Basic Building Code.
- B. Kentucky State Plumbing Law, Regulations and Code

1.06 SUBMITTALS

- A. Copies of all materials required to establish compliance with these Specifications shall be submitted in accordance with the provisions of Division 1, Section 01300. Submittals shall include at least the following:
1. Certified drawings showing all important details of construction and dimensions.
 2. Descriptive literature, bulletins, and/or catalogs of the equipment.
 3. The total weight of each item.
 4. A complete total bill of materials.
 5. A list of the manufacturer's recommended spare parts.

1.07 OPERATING INSTRUCTIONS

- A. Operating and maintenance instructions shall be furnished to the ENGINEER as provided in Division 1. The instructions shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc., that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. General
1. All valves and appurtenances shall be of the size shown on the Drawings and as far as possible all equipment of the same type shall be from one manufacturer.
 2. All valves and appurtenances shall have the name of the maker, flow directional arrows, and the working pressure for which they are designed cast in raised letters on some appropriate part of the body.
 3. All buried valves shall open left (counterclockwise). Insofar as possible, all valves shall open counterclockwise.

2.02 VALVES

A. Gate Valves

Gate valves shall be used in shut-off applications and where the valves are scheduled for infrequent use.

1. Gate Valves for Water

- a. Gate valves shall be for 125-pound water working pressure, 2-1/2 inches and 3 inches for air release. Valves 3 inches and smaller shall be standard brass construction, rising stem, double disc, parallel seat, with handwheel where exposed or key operated when in the ground. The valves shall be Crane No. 440, Jenkins 62U or approved equal.
- b. In copper-solder-joint piping, Chase Style 1334 or approved equal, gate valves are preferred with solder joint connections.

B. Plug Valves

Eccentric plug valves shall be used in shut-off applications for pump stations and where the valves are scheduled for infrequent use.

Eccentric plug valves 3 to 12 inches in diameter shall be rated for 175 psi working pressure. The body and cover shall be cast iron conforming to ASTM A126, Class B. Flange ends shall comply with ANSI B16.1, Class 125 standards. Mechanical joint ends shall comply with AWWA C11/ANSI 21.11.

The entire seat surface shall be protected by a welded nickel seat of minimum 1/8" thickness. The plug shall be cast iron ASTM A126, Class B. The portion of the plug in the valve body cavity shall be coated with Buna-N rubber using an injection-mold process. Valve bonnet shall be full sealed and bolted to the body for ease of maintenance. The seal between the body and the bonnet shall be an O-ring. Stem packing shall be Buna-N multiple "V" ring stem packing seals, conforming to AWWA C504 and AWWA C507 standards. The packing seal shall be held in place with an adjustable gland follower. Shaft bearings shall be sintered 316 stainless steel for both the upper and lower trunnions. Bearings shall be permanently lubricated. 3" valves shall be quarter-turn and shall be supplied with a position indicator marked at 10 degree increments. Valves 4" and larger shall be equipped with a worm gear operator. Eccentric plug valves shall be Clow F-5412, F-5413 or approved equal.

C. Ball Valves

Ball valves shall normally be used in quick shut-off and frequent use applications.

1. Ball Valves for Water Service

- a. Ball valves shall be for 125-pound water working pressure, 2 inches and smaller, standard bronze construction, with precision machined bronze ball, twin Buna-N seats, and handle operator with integral stop where exposed. Buried ball valves shall be as above with key or nut operators. Valves shall be Lunkenheimer No. 700-SB, Ford, or approved equal.

2. Ball Valves for Chlorine Solutions

- a. Ball valves shall be for 150 pound water working pressure, 140 degree Fahrenheit maximum temperature, 3 inches and smaller, standard PVC "True Union" construction, with PVC ball, Viton seats, and handle operator where exposed. Buried ball valves shall be as above with key, nut, pneumatic, or electric operators as shown on the DRAWINGS. Valves shall be Utilities Supply Corp., Plastic Piping Systems, or approved equal.

D. Swing Check Valves

Check valves for cast iron and ductile iron pipelines shall be swing type and shall meet the material requirements of AWWA Specification C508-latest revision. The valves shall be cast iron body with reinforced 125 lb flanges conforming to ANSI B 16.1. Valves shall be single disc with Buna-N seat, stainless steel hinge pin, 150 psi working water pressure, non-shock, and hydrostatically tested at 300 psi. The valves shall be manufactured by Clow, Kennedy or approved equal.

1. When there is no flow through the line, the disc shall hang lightly against its seat in practically a vertical position. When open, the disc shall swing clear of the water-way.
2. Valves shall be so constructed that disc and body seat may easily be removed and replaced without removing the valve from the line. Valves shall be fitted with an extended hinge arm with outside lever and adjustable weight.

E. Globe Style Silent Check Valves

1. General

- a. This specification covers the design, manufacture, and testing of 2 in. (50 mm) through 42 in. (1050 mm) Silent Check Valves suitable for pressures up to 500 psig (3450 kPa) water service.
- b. The Check Valve shall be of the silent operating type that begins to close as the forward flow diminishes and fully closes at zero velocity preventing flow reversal and resultant water hammer.

2 Standards, Approvals and Verification

- a. The valves for use in fire protection systems shall be Factory Mutual approved in sizes 2 1/2 in.-12 in.
- b. Stainless steel valves shall meet the requirements of ASME B16.34 and MSS SP-126.

- c. The valves used in potable water service shall be certified to NSF/ANSI 61, Drinking Water System Components – Health Effects, and certified to be Lead-Free in accordance with NSF/ANSI 61, Annex G.
- d. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.

3 Connections

- a. Globe style valves shall be provided in sizes 2 1/2 in (75 mm) through 42 in. (1050 mm) and have flat faced flanges in accordance with ASME B16.1 for Class 125 or Class 250 iron flanges. Sizes 10 in (250 mm) and smaller flanged valves shall be capable of mating directly to a wafer butterfly valve without disc interference.
- b. Wafer style valves shall be provided in sizes 2 in (50 mm) through 10 in. (250 mm) for installation between ASME B16.1 Class 125 or Class 250 iron flanges. Stainless steel wafer style valves shall include raised faces for installation between ASME B16.5 Class 150 flanges.

4 Design

- a. The valve design shall incorporate a center guided, spring loaded disc, guided at opposite ends and having a short linear stroke that generates a flow area equal to the nominal valve size.
- b. The operation of the valve shall not be affected by the position of installation. The valve shall be capable of operating in the horizontal or vertical positions with the flow up or down. Heavy duty springs for vertical flow down installations shall be provided when specified on 14 in. and larger valves.
- c. All component parts shall be field replaceable without the need of special tools. A replaceable guide bushing shall be provided and held in position by the spring. The spring shall be designed to withstand 100,000 cycles without failure and provide a cracking pressure of 0.5 psi.
- d. The valve disc shall be concave to the flow direction providing for disc stabilization, maximum strength, and a minimum flow velocity to open the valve.
- e. The valve disc and seat shall have a seating surface finish of 16 micro-inch or better to ensure positive seating at all pressures. The leakage rate shall not exceed the allowable rate for metal seated valves allowed by AWWA Standard C508 or 1 oz (30 ml) per hour per inch (mm) of valve diameter.

- f. The valve flow way shall be contoured and unrestricted to provide full flow areas at all locations within the valve. Cv flow coefficients shall be equal to or greater than specified by the manufacturer cited in Paragraph 7, and verified by an independent testing laboratory.
- g. Wafer-style valve seats shall be fully retained with full size threads, and sealed with an o-ring. Globe style valve seats shall be contained with a machined counterbore and restrained by the mating flange and gasket.

5 Materials

- a. The valve body shall be constructed of ASTM A126 Class B cast iron for Class 125 and Class 250 valves and ASTM A351 Grade CF8M for Class 150 stainless steel valves. Optional body material include ASTM A536 Grade 65-45-12 ductile iron.
- b. The seat and disc shall be ASTM B584 Alloy C83600 cast bronze or ASTM B148 Alloy C95200 aluminum bronze. Optional trim material include ASTM A351 Grade CF8M stainless steel.
- c. The compression spring shall be ASTM A313 Type 316 stainless steel with ground ends.

6 Options

- a. A Buna-N seal shall be provided on the seat when specified to provide zero leakage at both high and low pressures without overloading or damaging the seal. The seal design shall provide both a metal-to-metal and a metal-to-Buna-N seal.
- b. Valve interiors and exteriors shall be coated with an NSF/ANSI 61 certified fusion bonded epoxy in accordance with AWWAC550 when specified.

7 Manufacture

- a. The valves shall be hydrostatically tested at 1.5 times their rated cold working pressure and seat tested at the valve CWP. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.
- b. The exterior of the valve shall be coated with a universal alkyd primer.

- c. Silent Check Valves shall be Series #1400A (Wafer Style), 1400A.4 (Stainless Steel Wafer Style) or 1800 (Globe Style) as manufactured by Val-Matic® Valve & Mfg. Corporation, Elmhurst, IL. USA or approved equal.

E. Y Check Valves

Check valves for PVC pipelines shall be Y-type. The valves shall be PVC body with Viton seals, rated for 150 psi working water pressure. The disk guide shall be a PVC coil. The valves shall be manufactured by George Fischer, Hayward, or approved equal.

1. Valves shall be so constructed that the plunger assembly can be easily accessed for cleaning.
2. Valves shall be so constructed such full flow may be achieved. Minimal back pressure shall be necessary to seat the plunger.

F. Blow Off Valves

Blow off valves shall normally be used in quick shut-off and infrequent use applications.

1. Blow Off Valves for Plant Air, Instrument Air, and Water Service
 - a. Blow off valves shall be for 175 pound working pressure, 180 degree Fahrenheit, 3/4 inch thru 2 inches, and shall have a positive sealing system accomplished without metal-to-metal fits. O-ring seals shall be attached to removable plug for ease of replacement. The O-ring seals shall be pre-lubricated with a long life lubricant. Valves shall have a plastic thrust washer on top of the plug to provide a means of reducing thrust and rotary friction between metal plug and body and bronze retaining rings. The valve body and plug shall be cast of composition bronze ASTM B62-latest revision; O-ring shall be synthetic rubber. Connections shall be as shown on the DRAWINGS. All valves shall be subject to the following tests:
 - (1) 10-psi air test, valve open and closed position submerged in water. No leaks permitted.
 - (2) 175-psi hydrostatic, valve open and closed. No leaks permitted. Valves shall be Mueller Company Mark II Oriseal Valves, Crane, or approved equal.

G. Air Release Valves

1. Air Release Valves shall be furnished and installed at the locations shown on the PLANS. The valves shall be combination air valves as manufactured by A.R.I. Corporation, Kfar Charuv, Israel, or approved equal.

2. The valves shall be the size shown on the PLANS and be A.R.I. Model D-40 "BARAK" or approved equal.
3. The valves shall be designed to allow entrapped air to escape from the pipeline when pumps are started and close water tight when liquid enters the valves via a float and roll seal arrangement. In the event of a vacuum on the pipeline, the valves shall allow air to enter the pipe. Working pressures shall be as follows:
3/4" & 1" valve: 3-150 psi
2" valve: 2-230 psi
4. The body, of each valve assembly shall be constructed of high strength reinforced nylon. All wetted parts shall be corrosion resistant.

H. Automatic Air and Vacuum Relief Valves for Vertical Turbine Pumps

1. Combination air and vacuum valves for vertical turbine pumps shall be equal to APCO Air Valves for Vertical Turbine Pumps, per APCO Bulletin 586, as manufactured by Valve and Primer Corp., Schaumburg, Illinois, or approved equal.
2. Valves shall be the size shown on the drawings and shall be equipped with an automatic air release valve, such as APCO Valve No. 55, or approved equal.
3. Air valves for vertical turbine pumps shall be designed to allow large quantities of air to escape out the orifice when the pump is started and close water tight when the liquid enters the valve. The air valve shall also permit large quantities of air to re-enter through the orifice when the pump is stopped to prevent a vacuum from forming in the pump column.
4. The valve shall consist of a body, cover, baffle, float and seat. The valve shall be designed to prevent prematurely shut-off. The seat shall be fastened into the valve cover, without distortion, and shall be easily removed, if necessary.
5. The entire float and baffle assembly must be shrouded with a perforated water diffuser to prevent the water column entering the valve, from slamming the float shut and eliminate water hammer in the system.
6. The float shall be stainless steel, designed to withstand a minimum of 1,000 psi, or approved equal. The float shall be center guided and not free floating for positive seating.
7. The discharge orifice shall be fitted with an automatic air release valve in order to vent small pockets of air. This valve shall consist of a body, cover, float and seat, and shall be rated at a working pressure of 150 psi.

8. The body, cover, and baffle of this valve assembly shall be constructed of cast iron, conforming to ASTM A48 Class 30, or approved equal. The float shall be stainless steel, conforming to ASTM A240, or approved equal. The seats shall be BUNA-N and the water diffuser shall be brass, or approved equal. All flanges shall be 125# ANSI.

I. Altitude Valves

1. Application: The level control valve for the water storage tank shall be single acting, automatically closing to prevent tank overflow when the high water level is reached, and opening for refilling when the tank water level lowers. Non-throttling action is required for operation (valve will assume either a fully open or fully closed position).
2. Design: The level control valve shall be globe (inline) or angle (90 degree) body with flanged end connections, be fully mounted, external pilot operated, with free floating piston (operated without springs, diaphragm or levers). It shall contain a single full-ported seat, with seat bore equal to size of valve. The minimum travel of the piston shall be equal to 25% of the diameter of the seat. For true alignment (to correct lateral thrust and stem binding), the piston shall be guided above and below the seat a distance equal to no less than 75% of the diameter of the seat. The piston shall be cushioned and so designed as to insure positive closure. The main valve shall be packed with leather (or other soft material) to insure tight closure and prevent metal-to-metal friction and seating. The valve shall be furnished with an indicator rod to show position of piston opening, and pet-cocks for attachment to valve body for receiving gauges for testing purposes. The design shall be such that repairs and dismantling internally of main valve may be made without its removal from the line. The pilot valve, controlling operation of the main valve, shall have a range of adjustment, be easily accessible, and arranged to allow for easy removal from the main valve while the main valve is under pressure. The pilot valve, external strainer with blow-off, isolation valves, and all associated rigid brass piping and fittings (with the exception of a separate static pressure sensing line, if required) shall be factory assembled and furnished with the valve.
3. Physical and Chemical Properties: Valve body and cap(s) shall be constructed of gray iron castings that conform to ASTM Specification A 126 Class B. Internal bronze components shall conform to ASTM Specification B-584. Internal Stainless Steel components shall conform to ASTM Specification A-743 Grade CF-8 or CF-8M. The control piping shall be rigid red brass, no less than 0.5" in diameter. The flanged assemblies shall conform to ANSI standards for wall thickness of body and caps, and flange thickness and drilling, subject to other specified standards.

4. **Paint:** Ferrous surfaces of the valve shall be coated with NSF Certified Epoxy (Tnemec Series FC20) in accordance with ANSI/NSF Std. 61, and conforming to AWWA D102 Inside System No. 1.
5. **Testing:** A trio of tests shall be performed on the completely assembled valve prior to shipment. These shall include a hydrostatic test of up to two (2) times the working pressure (maximum 500 psi testing pressure), a tight seating test, and a performance test for simulated field conditions. The tests may be witnessed by the customer/engineer or representative.
6. **Manufacturer and Model:** The valve shall be a Model 30AWR as manufactured by Ross Valve Mfg. Co., Inc, 6 Oakwood Ave, Troy, NY 12180, or approved equal.

J. **Booster Pump Control Check Valves**

1. **Function:** The Pump Control Valve shall open fully or shut off in response to electric signals. It shall isolate the pump from the system during pump starting and stopping, to prevent pipeline surges.
2. **Main Valve:** The main valve shall be a center guided, diaphragm actuated globe valve of either oblique (Y) or angle pattern design. The body shall have a replaceable, raised, stainless steel seat ring. The valve shall have an unobstructed flow path, with no stem guides, bearings or supporting ribs. The body and cover shall be ductile iron. All external bolts, nuts, and studs shall be Duplex® coated. All valve components shall be accessible and serviceable without removing the valve from the pipeline.
3. **Actuator:** The actuator assembly shall be double chambered with an inherent separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shaft shall be center guided by a bearing in the separating partition. The replaceable radial seal disk shall include a resilient seal and shall be capable of accepting a V-Port Throttling Plug by bolting.
4. **Control System:** The control system shall consist of a 3-Way solenoid pilot (for 8" and larger valves, an accelerator shall be added to the solenoid), two check valves (for 12" and larger valves, an additional check valve), a limit switch, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested.
5. **Quality Assurance:** The valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard. The main

valve shall be certified as a complete drinking water valve according to NSF, WRAS, and other recognized standards.

6. **Manufacturer and Model:** The valve shall be manufactured by Bermad Waterworks, Model WW-(nominal size)-740-03-Y-C-A5-EB-4AC-NN or approved equal.

K. Surge Anticipating Control Valves

1. **Function:** The Surge Anticipating Valve shall open in response to the pressure drop associated with abrupt pump stoppage to dissipate the returning high pressure wave, eliminating the surge. It shall smoothly close drip tight as quickly as the relief feature allows, while preventing closing surge. The valve shall also relieve excessive system pressure.
2. **Main Valve:** The main valve shall be a center guided, diaphragm actuated globe valve of either oblique (Y) or angle pattern design. The body shall have a replaceable, raised, stainless steel seat ring. The valve shall have an unobstructed flow path, with no stem guides, bearings, or supporting ribs. The body and cover shall be ductile iron. All external bolts, nuts, and studs shall be Duplex® coated. All valve components shall be accessible and serviceable without removing the valve from the pipeline.
3. **Actuator:** The actuator assembly shall be double chambered with an inherent separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shaft shall be center guided by a bearing in the separating partition. The replaceable radial seal disk shall include a resilient seal and shall be capable of accepting a V-Port Throttling Plug by bolting.
4. **Control System:** The control system shall consist of two adjustable 2-way pilots, a needle valve, a flow stem, a cock valve, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested.
5. **Quality Assurance:** The valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard. The main valve shall be certified as a complete drinking water valve according to NSF, WRAS, and other recognized standards.
6. **Manufacturer and Model:** The valve shall be manufactured by Bermad Waterworks, Model WW-(nominal size)-735-55-Y-C-A5-EB-NN-M or approved equal.

L. Pressure Reducing Valves

1. **Pressure reducing valves** shall be of the single seated balanced design type globe body with threaded inlet and outlet ports. It shall be

diaphragm operated, spring loaded permitted adjustment over a range of no less than 30 psi.

2. The body shall be bronze construction with bronze or stainless steel stem and furnished with a replacement rubber seat.
3. The pressure reducing valves shall be G-A Industries, APCO, or equal.

2.03 SPECIALTIES AND ACCESSORIES

A. Yard Hydrants

1. Above ground yard hydrants shall be of the anti-freezing, non-pollutable type, 1-1/2" size for 30" cover over water service line. The yard hydrant assembly shall include a ball-wheel handle, vacuum breaker, 1-1/2" hose connection, and double-ball check valve on the drain. The operating valve shall be located at the bottom of the hydrant assembly. When the operating valve is turned off it shall allow the water remaining in the supply line in the hydrant above the valve to drain from the hydrant by means of a by-pass in the valve stem. The hydrant handle, casing, and base shall be cast iron, and the operating valve red brass.
2. The yard hydrant shall be Murdock BFHM-150, 1-1/2" or approved equal.
3. All hydrants shall be furnished with anti-siphon vacuum breaker.

B. Hose and Nozzles

1. Hose

- a. Furnish 3/4-inch and 1-1/4 inch hose as indicated below. The 3/4 inch hose for hose stations shall be heavy-duty rubber, Gates Figure 35B, or approved equal. Hose for yard hydrants shall be as above in 1-1/4 inch size.
- b. Furnish one 3/4" x 50' hose for each 3/4" hose station and one 1-1/4" x 75' hose for each yard hydrant.
- c. Furnish 1-1/2" x 1-1/4" reducing adaptors for connecting each 1-1/4" hose to each 1-1/2" hydrant.

2. Nozzles

- a. Furnish 1-1/4" x 8" cast plain brass nozzles for each yard hydrant, and 3/4-inch nozzles for each hose station. The 1-1/4-inch nozzles shall be Akron Brass, or approved equal; and the 3/4-inch nozzle for hose stations shall be Leonard N-2, or approved equal.

C. Strainers, Filters, and Dryers

1. Strainers for Water Service

- a. Strainers shall be "Y" type with a cast iron body manufactured in accordance with ASTM A126-latest revision Class B steel, sizes 3/4 inch thru 12 inches. Strainer shall be rated at 200 psi pressure @ -20 to 150 deg F, and 125 @ 450 deg F., with a 304 stainless steel 0.125" perforated screen.
- b. Cover shall be carbon steel manufactured in accordance with ASTM A126-B latest revision. Cover shall contain a blow off outlet with an NPT outlet for connection of a drain valve.
- c. Contractor shall furnish and install on the blow off outlet, a stainless steel ball valve and cast iron piping directed to the floor drain.
- d. Strainers shall be Mueller, Model 758 or approved equal.

D. Vacuum Breakers

1. Vacuum Breakers for Water Service

- a. Vacuum breakers shall be designed to prevent back-siphonage of water lines. Valve types shall be either bottom inlet or side outlet, or top inlet and bottom outlet as required. Internal discs or floats shall be either plastic or silicone. Piping systems with solenoid-operated valves shall require a vacuum breaker with an "O" ring seal. Breakers shall be Sloan No. V-350-A, V-370-A, V-188-A, Wilkins, or approved equal.

2. Air and Vacuum Valve for Surface Wash

- a. Air and vacuum valve for the surface wash supply pipe shall be 1/2 inch. Valve shall be APCO Model 141 or approved equal.

E. Dielectric Pipe Couplings

1. Dielectric pipe couplings shall be used wherever copper pipe connects to steel or cast iron pipe and appurtenances. Couplings shall have steel bodies with non-conducting bushings on both ends. Ends shall have standard pipe threads. Couplings shall be rated for at least 200 psi at 225°F. Couplings shall be as manufactured by Thermodynamics Corporation, Needham, MA; Water Vallett Company, Detroit, MI; or approved equal.

F. Water-hammer Arresters

1. Water-hammer arresters shall be used on water lines as shown on the DRAWINGS. Arresters shall consist of a permanently pre-charged air chamber and a rugged rubber sealed-in diaphragm to absorb shock. The unit shall be capable of being mounted at any angle. Arresters shall be Watts No. 150, or approved equal.

G. Air Vents

1. Air vents shall be used on water lines as shown on the DRAWINGS for the removal of unwanted air. Vents shall be rated at 150 pounds working water pressure, shall have a safety drain connection, stainless or copper clad steel internal components and a cast iron or brass body and cap. Vents shall be Hoffman No. 78, or approved equal.
2. See Section 15500 of these SPECIFICATIONS for air vents on unit heaters.

H Rubber Expansion Joints

Rubber expansion joints shall be mounted on the suction and discharge of each pump.

1. Expansion joints shall be single arch type of butyl rubber construction with carcass of high grade woven cotton or suitable synthetic fiber and individual solid steel ring reinforcement. Soft rubber fillers shall be integrally cured into the arches to prevent settling of material into the arch. Interior surface shall comply with NSF 61 for potable water contact. Joints shall be constructed to pipeline size and to meet working pressure and corrosive conditions similar to the line where installed. Joints shall have full faced fabric reinforced butyl flanges integral with body. Split type steel backup rings shall be provided to ensure a good joint. Rings shall be designed for mating the ANSI Standard 150 lb. flanges. Joints shall have a working pressure rating of 140 psig (minimum). All joints shall be finish coated with Hypalon paint.
2. Expansion joints shall be furnished with control units. Control units shall consist of two (2) drilled plates, stretcher bolts, and rubber washers backed by metal washers. The stretcher bolts shall prevent over-elongation of the joint. Extra nuts shall be provided on the stretcher bolts on the inside of the plate to prevent over-compression. All nuts, bolts and plates shall be galvanized.
3. Expansion joints shall be Style 500B as manufactured by Mercer Rubber Company, Style 4140 by Uniroyal Company, or equal.

I. Water Service Accessories

1. Backflow Preventers

- a. The reduced pressure principle backflow preventers shall be a complete assembly consisting of two independently acting spring loaded toggle levers or poppet-type check valves together with an automatically operating pressure differential relief valve located between the two check valves. The first check valve shall reduce the supply pressure a predetermined amount so that during normal flow and the cessation of normal flow, the pressure between the checks is less than the supply pressure. In the case of leakage of either check valve, the differential relief valve shall discharge to atmosphere to maintain the pressure between the checks at a level less than the supply pressure.
- b. Each unit shall include tightly closing shutoff valves located at each end of the device, and shall be fitted with four properly located test cocks. Operation shall be completely automatic. All parts must be removable or replaceable without removal of the unit from the line. The total head loss through the complete backflow assembly shall not exceed 10 psi at rated flow.
- c. The backflow preventer shall be Watts 9090SOS&Y, or approved equal, shall have prior approval of the State Environmental Protection Agency and shall be in accordance with AWWA C506-latest revision.
- d. Furnish and mount an air gap on the body of the backflow preventer. The air gap shall be Watts No. 909AG, or approved equal.

2. Service Clamps

- a. Service clamps shall have malleable or ductile iron bodies, which extend at least 160 degrees around the circumference of the pipe and shall have neoprene gaskets cemented to the saddle body. Bodies shall be tapped for either corporation stop threads of IPS as required. Clamps with tap sizes 1 inch and smaller shall be of the single strap design. Clamps with tap sizes larger than 1 inch shall be of the double strap design.
- b. Service clamps shall be Style 91 or 291 as manufactured by Dresser Industries, Inc., Type 311 or 313 as manufactured by Smith-Blair, Inc. or equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the ENGINEER before they are installed.

- B. Control valves in all locations shall be so grouped and located that they may be easily operated, through access panels, doors, or adjacent to equipment.
- C. After installation, all valves and appurtenances shall be tested at least one hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the ENGINEER.
- D. Install all brackets, extension rods, guides, the various types of operators and appurtenances as shown on the DRAWINGS in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the CONTRACTOR shall check all DRAWINGS and figures which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.
- E. All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves and other equipment which do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to the OWNER.
- F. Fire hydrants and yard hydrants shall be set at the locations as shown on the DRAWINGS and bedded on a firm foundation. A drainage pit as detailed on the DRAWINGS shall be filled with screened gravel and satisfactorily compacted.
- G. During backfilling, additional screened gravel shall be brought up around, and 6-inches over, the drain port. Each hydrant shall be set in true vertical alignment and properly braced. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the DRAWINGS. Felt roofing paper shall be placed around hydrant elbow before placing concrete. CARE SHALL BE TAKEN TO INSURE THAT CONCRETE DOES NOT PLUG THE DRAIN PORTS.
- H. If directed, the hydrant shall be tied to the pipe with suitable rods or clamps, galvanized, painted, or otherwise rustproof treated. Concrete used for backing shall be no leaner than 1 part cement, 2-1/2 parts sand, and 5-1/2 parts stone. Hydrant paint shall be touched up as required after installation.
- I. Buried flanged or mechanical joints shall be made with cadmium-plated bolts. All exposed bolts and nuts shall be cadmium-plated. All exposed bolts and nuts shall be heavily coated with two coats of bituminous paint.
- J. Yard hydrants shall be installed in accordance with manufacturer's recommendation and applicable requirements of the fire hydrants above.
- K. Buried valves and valve boxes shall be set with the valve stem vertically aligned in the center of the box. Valves shall be set on firm foundation and supported by tamping selected excavated material under the sides of the

valve. The valve box shall be supported during backfilling and maintained in vertical alignment with the top flush with finish grade.

3.02 SHOP PAINTING

- A. Interior surfaces of all valves, the exterior surfaces of buried valves, and miscellaneous piping appurtenances shall be given a shop finish of an asphalt varnish conforming to Federal Specification TT-V51e for Varnish Asphalt.
- B. The exterior surface of various parts of the valves, operators, floor stands and miscellaneous piping shall be thoroughly cleaned of all scale, dirt, grease or other foreign matter and thereafter one shop coat of an approved rust-inhibitive primer, such as Inertol Primer No. 621, shall be applied in accordance with the instructions of the paint manufacturer.
- C. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating.
- D. Field painting is specified under Division 9, Section 09900.

3.03 INSPECTION AND TESTING

- A. The various pipelines in which the valves and appurtenances are to be installed are specified to be field-tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable to the ENGINEER.
- B. Various regulating valves, strainer, or other appurtenances shall be tested to demonstrate their conformance with the specified operational capabilities and any deficiencies shall be corrected or the device replaced or otherwise made acceptable to the ENGINEER.

END OF SECTION

SECTION 15101

LARGE VALVES AND APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves and appurtenances where shown on the Drawings as specified herein.
- B. The equipment specified herein includes the following:
 - 1. Gate valves with boxes for yard piping
 - 2. Gate valves for inside service
 - 3. Butterfly valves for yard piping
 - 4. Butterfly valves for inside service
 - 5. Plug valves for yard piping
 - 6. Plug valves for interior or above ground service
 - 7. Ball valves
 - 8. Check valves
 - 9. Air and vacuum relief valves (piping application)
 - 10. Automatic air release valves
 - 11. Shock absorbers
 - 12. Service clamps
 - 13. Expansion joints
 - 14. Pressure-reducing valves
 - 15. Back Pressure Sustaining Valves
- C. The work of this Section shall include the installation of valve tags furnished by the CONTRACTOR. All exposed valves provided under this Section shall be tagged.

1.02 RELATED WORK NOT INCLUDED

- A. Excavation, backfill, fill and grading is included in Division 2.
- B. Piping is included in the respective sections of Division 2 and 15.
- C. Valves, hydrants, meters and service lines for distribution system application are included in Division 2.
- D. Valves and service accessories on all plumbing systems are included in this Division, Section 15100.
- E. Pipe hangers and supports are included in this Division, Section 15094.

F. Electrical is included in Division 16.

1.03 DESCRIPTION OF SYSTEMS

A. All of the equipment and materials specified herein is intended to be standard for use in controlling the flow of wastewater, sludges, water, air or chemicals, depending on the applications.

1.04 QUALIFICATIONS

A. All of the types of valves and appurtenances shall be products of well-established firms who are fully experienced, reputable and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these SPECIFICATIONS as applicable.

1.05 SUBMITTALS

A. Complete shop drawings of all valves and appurtenances shall be submitted to the ENGINEER in accordance with the requirements of Division 1.

B. Furnish all information required in Division 1.

1.06 OPERATING INSTRUCTIONS

A. Manufacturer's operating and maintenance instructions as set forth in Division 1 shall be furnished to the ENGINEER for equipment furnished under this Section.

1.07 TOOLS

A. Special tools, if required for normal operation and maintenance, shall be supplied with the equipment.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General

1. All valves and appurtenances shall be of the size shown on the PLANS and as far as possible all equipment of the same type shall be from one manufacturer.
2. All valves and appurtenances shall have the name of the maker, flow-directional arrows, and the working pressure for which they are designed cast in raised letters on some appropriate part of the body.
3. Handwheel operator shall be no less than 12-inch diameter.

4. Except as otherwise shown on the PLANS or specified herein, all valves with operators located 7 feet or more above the operating floor shall be provided with chain-wheel operators complete with chain guides and galvanized steel chain.
5. All buried valves shall open left (counterclockwise). Insofar as possible, all valves shall open counterclockwise.
6. All butterfly valves, gate valves and plug valves 8 inches or larger shall be furnished with gear operators and gear cases conforming to the requirements of AWWA C504 or as shown on the PLANS.

2.02 VALVES

A. Butterfly Valves for Buried Service

1. Butterfly valves and operators for buried service shall conform to AWWA C504, except as hereinafter provided. Butterfly valves shall be rated for Class 150B and both valve and operator shall be especially designed for service buried in the ground where the ground water may at times completely submerge the valve and operator, and shall be of the totally enclosed type.
2. The valve bodies shall be of cast iron conforming to ASTM A48-CL 40. Valve ends shall be mechanical joint meeting ANSI Specification A21.11.
3. Except as otherwise specified herein, valve shafts shall be of Type 304 stainless steel. Shaft seals shall be rubber O-ring seals. Shafts having a minimum torsional strength equivalent to shafts specified in Section 3.3 of AWWA C504 and completely isolated from the pipeline contents shall be furnished. Connections between shafts and discs shall be designed to transmit full shaft torque.
4. If the rubber seat is in the body, the disc shall be of an alloy cast iron conforming to ASTM A436 Type I with the periphery machined to a smooth spherical surface. If the rubber seat is mounted on the disc edge it shall be held in place by a one-piece Type 304 stainless steel retaining ring and stainless steel screws, the disc shall be of ASTM A48, Class 40 cast iron and a mating Type 304 stainless steel ring shall be installed in the valve body.
5. The unit shall be permanently lubricated with grease or oil. A standard AWWA 2 inch square operating nut shall be provided on the input shaft and it shall have a cap to center the valve box. Valves shall open to the left (counterclockwise).
6. Valve and operator assemblies shall be given two coats of asphalt varnish conforming to Section 4 of AWWA C504.

7. An Affidavit of Compliance in accordance with Section 1.5 of AWWA C504 shall be furnished to the ENGINEER prior to shipment of valves to the job site.
8. Valve boxes shall be provided for each buried valves. Valve boxes and appurtenances are specified in Division 5, Section 05540.
9. Four tee-handled gate wrenches of suitable length shall be furnished to operate all valves with valve boxes.

B. Butterfly Valves (for Interior Service)

1. Butterfly valves and operators shall conform to the AWWA Standard Specification for rubber seated butterfly valves Designation C504, except as hereinafter specified. Valves shall have a minimum 150-psi pressure rating and be equal to those manufactured by Allis-Chalmers, Henry Pratt Company, or equal.
2. Butterfly valves shall be flanged end with face-to-face dimensions in accordance with Table 3 of the above mentioned AWWA Specification for short-body valve, or wafer type.
3. Valve seats shall be full resilient seats retained in the body or the disc edge in accordance with Section 3.5 of the above mentioned AWWA Specification. If the resilient seat is in the body, the disc shall be of an alloy cast iron conforming to ASTM A436 Type 1 with the periphery machined to a smooth spherical surface. If the resilient seat is mounted on the disc edge, it shall be held in place by a one-piece Type 304 stainless steel retaining ring and stainless screws, the disc shall be of ASTM A48, Class 40 cast iron and a mating Type 304 stainless steel ring shall be installed in the valve body. Resilient seats shall be Hycar or equal for water service and Nordel or equal for air service.
4. The valve body shall be constructed of close grain cast iron per ASTM A126, Class B with integrally cast hubs for shaft bearing housings of the through boss-type. Permanently self-lubricating body bushings shall be provided and shall be sized to withstand bearing loads. Stuffing box of liberal dimensions shall be provided at the operator end of the vane shaft, arranged so that the packing can be replaced by removing the bronze follower without removing the operator. Packing shall be of the Chevron type as manufactured by Garlock Packing Company. A sealing element utilizing O-rings shall also be acceptable.
5. The valve shaft shall be of Type 304 stainless steel and designed for both torsional and shearing stresses when the valve is operated under its greater dynamic or seating torque.
6. In general, the butterfly valve operators shall conform to the requirements of Section 3.8 of the AWWA Standard Specifications for

Rubber Seated Butterfly Valves, Designation C504, insofar as applicable and as herein specified.

7. Gearing for the operators where required shall be totally enclosed in a gear case in accordance with Section 3.8.3 of the above mentioned AWWA Standard Specification.
8. The manual operators shall conform to Section 3.8.2 of the above mentioned AWWA Standard Specifications, insofar as applicable. Valves shall have Handwheel or lever operators and open left, or counterclockwise. Operators shall have indicators to show position of the valve disc. Operators shall be rigidly attached to the valve body.

C. Gate Valves and Appurtenances for Yard Piping

1. Gate valves for water shall meet the requirements of AWWA C509 covering resilient seated gate valves. Valves shall be rated for 200-psi working pressure and a minimum of 400-psi test pressure. The wedge shall be of cast iron completely encapsulated with rubber. The sealing rubber shall be permanently bonded to the cast iron wedge to meet ASTM tests for rubber metal bond ASTM D429. They shall have non-rising cast bronze stems (unless otherwise shown on the PLANS) and be fitted with "O-ring" seals. The operating nuts shall be 2-inch square. All valves shall open left, or counterclockwise. Stuffing boxes shall be the "O-ring" type with two rings located above thrust collar; the two rings shall be replaceable with valve fully open and subjected to full rated working pressure. Gate valves shall be mechanical joint, ANSI Standard 21.11 except where shown otherwise. The body and bonnet shall be coated with a fusion coating both interior and exterior to meet C50. Each valve shall have maker's name, pressure rating and year in which manufactured cast on the body. Gate valves shall be as manufactured by Mueller Co., or approved equal.
2. Tapping sleeves shall be as manufactured by the Ford Meter Box Company, Inc., with cadmium-plated cast iron nuts and bolts. Sleeves shall be of cast iron, designated for working pressures not less than 200 psi. Lead gaskets shall be provided for the full area of the sleeve flanges.
3. Tapping valves shall conform to the requirements specified above for gate valves except that one end shall be flanged and one mechanical. Tapping valves shall be provided with an over-sized opening to permit the use of full sized cutters.
4. Four tee-handled gate wrenches of suitable length shall be furnished to operate all valves with valve boxes.

D. Gate Valves for Inside Service

15101-5

1. See Section 15100 of these SPECIFICATIONS for gate valves 2-1/2" in diameter and smaller.
2. Gate valves 3" and larger in size, unless otherwise specified shall be iron body, bronze mounted, solid wedge gate valves with flanged ends and conforming to the AWWA Standard Specification for Gate Valve for Water and Sewage Systems, Designation C509-latest revision, insofar as applicable and in addition to the following requirements:
 - a. Valve shall be outside screw and yoke type with rising stem (unless otherwise shown on the PLANS).
 - b. Flanges shall be faced and drilled to ANSI B16.1 125 pound template, unless otherwise shown on the PLANS.
 - c. Bronze gate rings shall be fitted into grooves of dovetail or similar shape in the gates. For grooves or other shapes, the rings shall be firmly attached to the gates with bronze rivets.
 - d. Handwheels shall turn counterclockwise to open the valves. Handwheels shall be of ample size and shall have an arrow and the word "OPEN" cast thereon to indicate the direction of opening.
 - e. Stuffing box follower bolts shall be of steel and the nuts shall be of bronze.
 - f. The design of the valves shall permit packing the valves without undue leakage while they are wide open and in service.
 - g. O-ring stuffing boxes may be used.
 - h. Gate valves for pipeline installation shall be housed in an adjustable two-piece cast iron valve box and have a cover with the word "Water" or "Sewer" stamped or cast.
 - i. Gate valves with spur gears shall be housed to accommodate the offset of the operating nut.

E. Gate Valves For 16 and 24 Inch Distribution Mains

1. General

Valves to be installed on 16 and 24-inch high service and transmission lines shall conform to the latest revision of AWWA Standard C-509 covering resilient seated gate valves. These large diameter valves shall be as manufactured by Clow Valve Co., M & H Valve Co., or approved equal.

2. Design

The valves shall be either, **non-rising stem**, opening by turning stem left or right and provided with **2" square operating nut or handwheel** with the word Open and an Arrow cast in the metal to indicate direction to open.

The wedge shall be of cast iron completely encapsulated with rubber.

The sealing rubber shall be permanently bonded to the cast iron wedge to meet ASTM tests for rubber metal bond ASTM D429.

Stems for NRS assemblies shall be cast bronze with integral collars in full compliance with AWWA. OS & Y stems shall be on bronze bar stock. The NRS stem stuffing box shall be the o-ring seal type with two rings located above thrust collar; the two rings shall be replaceable with valve fully open and subjected to full rated working pressure.

There shall be two low torque thrust bearings located above and below the stem collar. The stem nut shall be independent of wedge and shall be made of solid bronze. There shall be a smooth unobstructed waterway free of all pockets, cavities and depressions in the seat area.

3. Materials

All cast iron shall conform to ASTM-A-126 Class C. Castings shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed.

Stems shall be manganese bronze having a minimum tensile strength of 60,000 psi, a minimum yield of 20,000 psi.

Bolts shall be electro-zinc plated steel with hex heads and hex nuts in accordance with ASTM A-307 and A-563, respectively.

4. Testing

Prior to shipment from factory, each valve shall be tested by hydrostatic pressure equal to twice the specified working pressure of 250 psi.

5. Coating AWWA

The body and bonnet shall be coated with a fusion coating both interior and exterior to meet C550.

6. Marking

Valves shall be marked with name of manufacturer, the year of manufacture, the maximum working pressure and size of valve.

F. Plug Valves for Interior or Above Ground Service

1. Plug valves shall be manufactured in accordance with AWWA C-504, shall be of the 1/4 turn, eccentric, non-lubricated type, serviceable under full line pressure, and capable of sealing in both directions at the rated pressure. Valves shall have a minimum port area of 80% of the nominal pipe size. The valve body shall be of cast iron, 30,000 psi tensile strength with added nickel and chromium, ASTM A-126, Class B, 175 psi rating. Valve ends shall be flanged. The valve plug shall be ductile iron conforming to ASTM A-536, Grade 65-45-12 with neoprene resilient facing. The valve seating design shall be resilient and of the continuous interface type having consistent opening/closing torques and shall be non-jamming in the closed position. Closure shall be accomplished by means of an off-set plug design with a resilient seating face that achieves full 360 degree seating contact. Valves shall be of the bolted bonnet design. The resilient faced plug shall be replaceable without removing the valve body from the line. The valve body seating area shall be corrosion resistant by a welded-in overlay of high nickel content. Sprayed or plated seating surfaces will not be acceptable. Valves shall have permanently lubricated Type 316 stainless steel bearings on the upper and lower plug stem journal. Bearings shall be replaceable. Packing shall be Buna N (Vee Type) rated for 150 psig working pressure. Packing shall be adjustable and valves shall be designed such that they can be repacked without removing the bonnet. All exposed nuts, bolts, springs, and washers shall be zinc plated, except exposed hardware for submerged valves that shall be of stainless steel.
2. All valves shall be equipped with gear actuators and handwheel operators (unless otherwise shown on the PLANS). All gearing shall be enclosed suitable for running in oil with seals provided on all shafts to prevent entry of dirt and water into the actuator. All shaft bearings shall be furnished with permanently lubricated bronze bearing bushings. Actuator shall clearly indicate valve position and an adjustable stop shall be provided. Construction of actuator housing shall be semi-steel. Hardware on actuators shall be of the same materials as the valves.
3. All valves and actuators shall be as manufactured by DeZurik Corporation or equal.
4. All plug valves shall be installed so that the direction of flow through the valve is in accordance with the manufacturer's recommendations.

G. 3-Way Plug Valves

1. Valves shall be of the non-lubricated taper plug type and shall have resilient faced plugs for drip tight shutoff. End connections shall be flanged and shall be drilled to ANSI 125 pound standard. Valves shall be semi-steel and shall have stainless steel bearings in the upper and lower journal areas. The three-way valve shall be furnished as standard with a plug to shut off one port at a time.
2. The valve shall be furnished with a resilient facing bonded to the plug sealing surface and shall have double handwheel actuators. The actuator shall be of the worm and gear type and shall have one handwheel to lift and reseal the plug and one handwheel to rotate the plug. Handwheel actuators shall be totally enclosed and shall have seals and gaskets to prevent entry of dirt, water or corrosive atmosphere. Actuators shall have corrosion resistant bearings on the gear sector. Actuators shall provide plug rotation up to 360°.
3. The 3-way valves, actuators and accessories shall be as manufactured by DeZurik Corporation, or equal.

H. Plug Valves for Yard Piping

1. Plug valves for yard piping shall be as specified above for interior plug valves, except valves shall have mechanical joint ends and stainless steel hardware. Buried actuators shall be as specified above and shall be of buried, submerged service with seals on all covers and shafts and all exposed hardware of stainless steel. Provide valve box, stem extension, and operating nut as specified above for gate valves.

I. Ball Valves

1. See Section 15100 of these SPECIFICATIONS.

J. Check Valves

1. Check valves for cast iron and ductile iron pipelines shall be swing type and shall meet the material requirements of AWWA Specification C508-latest revision Swing-Check Valves for ordinary water-works service. The valves shall be iron body, bronze mounted, single disc, 150 psi working water pressure, non-shock, and hydrostatically tested at 300 psi. Ends shall be 125 lb. ANSI B16.1 flanges.
 - a. When there is no flow through the line the disc shall hang lightly against its seat in practically a vertical position. When open, the disc shall swing clear of the water-way.
 - b. Check valves shall have bronze seat and body rings, extended bronze hinge pins and bronze nuts on the bolts of bolted covers.
 - c. Valves shall be so constructed that disc and body seat may easily be removed and replaced without removing the valve

from the line. Valves shall be fitted with an extended hinge arm with outside lever and spring. Springs with various tensions shall be provided and springs approved by the ENGINEER shall be installed.

K. Automatic Air and Vacuum Relief Valves for Vertical Turbine Pumps

1. Combination air and vacuum valves for vertical turbine pumps shall be equal to APCO Air Valves for Vertical Turbine Pumps, per APCO Bulletin 586, as manufactured by Valve and Primer Corp., Schaumburg, Illinois, or approved equal.
2. Valves shall be the size shown on the drawings and shall be equipped with an automatic air release valve, such as APCO Valve No. 55, or approved equal.
3. Air valves for vertical turbine pumps shall be designed to allow large quantities of air to escape out the orifice when the pump is started and close water tight when the liquid enters the valve. The air valve shall also permit large quantities of air to re-enter through the orifice when the pump is stopped to prevent a vacuum from forming in the pump column.
4. The valve shall consist of a body, cover, baffle, float and seat. The valve shall be designed to prevent prematurely shut-off. The seat shall be fastened into the valve cover, without distortion, and shall be easily removed, if necessary.
5. The entire float and baffle assembly must be shrouded with a perforated water diffuser to prevent the water column entering the valve, from slamming the float shut and eliminate water hammer in the system.
6. The float shall be stainless steel, designed to withstand a minimum of 1,000 psi, or approved equal. The float shall be center guided and not free floating for positive seating.
7. The discharge orifice shall be fitted with an automatic air release valve in order to vent small pockets of air. This valve shall consist of a body, cover, float and seat, and shall be rated at a working pressure of 150 psi.
8. The body, cover, and baffle of this valve assembly shall be constructed of cast iron, conforming to ASTM A48 Class 30, or approved equal. The float shall be stainless steel, conforming to ASTM A240, or approved equal. The seats shall be BUNA-N and the water diffuser shall be brass, or approved equal. All flanges shall be 125# ANSI.

L. Air Release Valves

1. Combination Air Valve Assemblies

- a. Sizes 1-inch through 6-inch. Valve shall be single body, double orifice, allowing air to exit when filling a pipeline, and air to enter when draining. Orifices shall operate independently; the smaller release orifice shall be capable of opening when the larger is in the closed position.
- b. The valve shall be designed to prevent premature closing. The closing mechanism shall be either needle and seat and be Buna-N, or of the rolling seal type made of Rubber E.P.DM., and attached to the valve cover to ensure drop-tight shut-off. The float shall be stainless steel, hermetically sealed, and designed to withstand pressures up to 1000 pounds per square inch, or approved equal. The float shall be of corrosion resistant materials in accordance with ASTM A240, or approved equal. The plug shall be bronze and in accordance with ASTM B124, or approved equal. The body, cover, and leverage frame shall be cast iron/Delrin and shall be in accordance with ASTM A126 GR, B and ASTM D2133, reinforced Nylon, or approved equal.
- c. Valve exterior shall be painted with Red Oxide Phenolic Primer, or approved equal as accepted by the FDA for use in contact with potable water.
- d. Valve to be APCO Model (corresponding to size) Combination Air Valve as manufactured by Valve & Primer Corp., Schaumburg, Illinois, U.S.A., or approved equal.
- e. Air valves shall be installed as shown in the plans, housed in a valve box with cover. Valve boxes for air valves shall be carefully set to grade with covers at grade.

2. Air Release (Vent) Valve Assemblies

- a. Air Vent Valve No. 50, or approved equal. Valve shall operate under pressure, allowing entrapped air to escape from a pipeline. Orifices shall operate by means of a simple lever mechanism (stainless steel, ASTM A240), rolling seal mechanism, or approved equal to prevent water from escaping as or after air is expelled.
- b. The closing mechanism shall be either needle and seat and be Buna-N, or of the rolling seal type made of Rubber E.P.DM., and attached to the valve cover to ensure drop-tight shut-off. The float shall be stainless steel, hermetically sealed, and designed to withstand pressures up to 1000 pounds per square inch, or approved equal. The float shall be of corrosion resistant materials in accordance with ASTM A240, or approved equal. The seat shall be of stainless steel, or

approved equal. The seat shall have an orifice of 3/32 inches, or approved equal to operate up to 175 pounds per square inch (psi), or a 1/16 inch orifice when operation at pressures higher than 175 psi, or approved equal. The body shall be cast iron, ASTM A48, Class 30, or approved equal, and shall have a ½ inch NPT female threaded inlet and outlet, and be rated for 350 psi test pressure.

- c. Valve exterior shall be painted with Red Oxide Phenolic Primer, or approved equal as accepted by the FDA for use in contact with potable water.
- d. Valve to be APCO Model 50 Air Vent Valve as manufactured by Valve & Primer Corp., Schaumburg, Illinois, U.S.A., or approved equal.

M. Shock Absorbers

- 1. Shock absorbers shall be supplied on the plant water distribution piping where shown on the PLANS. The shock absorbers shall be Model 1485-1 as manufactured by Josam Manufacturing Company, Michigan City, Indiana or approved equal.

N. Service Clamps

- 1. Service clamps shall have malleable or ductile iron bodies, which extend at least 160 degrees around the circumference of the pipe and shall have neoprene gaskets cemented to the saddle body. Bodies shall be tapped for either corporation stop threads of IPS as required. Clamps with tap sizes 1 inch and smaller shall be of the single strap design. Clamps with tap sizes larger than 1 inch shall be of the double strap design.
- 2. Service clamps shall be Style 91 or 291 as manufactured by Dresser Industries, Inc., Type 311 or 313 as manufactured by Smith-Blair, Inc. or equal.

O. Expansion Joints

- 1. Expansion joints shall be single arch type of butyl rubber construction with carcass of high grade woven cotton or suitable synthetic fiber and individual solid steel ring reinforcement. Soft rubber fillers shall be integrally cured into the arches to prevent settling of material into the arch. Joints shall be constructed to pipeline size and to meet working pressure and corrosive conditions similar to the line where installed. Joints shall have full faced fabric reinforced butyl flanges integral with body. Split type steel backup rings shall be provided to ensure a good joint. Rings shall be designed for mating the ANSI Standard 150 lb. flanges. Joints shall have a working pressure rating of 140 psig (minimum). All joints shall be finish coated with Hypalon paint.

2. Expansion joints shall be furnished with control units. Control units shall consist of two (2) drilled plates, stretcher bolts, and rubber washers backed by metal washers. The stretcher bolts shall prevent over-elongation of the joint. Extra nuts shall be provided on the stretcher bolts on the inside of the plate to prevent over-compression. All nuts, bolts and plates shall be galvanized.
3. Expansion joints shall be Style 500B as manufactured by Mercer Rubber Company, Style 4140 by Uniroyal Company, or equal.

P. Pressure Reducing Valves

1. Pressure reducing valves shall be of the single seated balanced design type globe body with threaded inlet and outlet ports. It shall be diaphragm operated, spring loaded permitted adjustment over a range of no less than 30 psi.
2. The body shall be bronze construction with bronze or stainless steel stem and furnished with a replacement rubber seat.
3. The pressure reducing valves shall be G-A Industries, APCO, or equal.

Q. Mud Valves

1. Mud valves shall be flanged end, rising stem type.
2. Bodies shall be cast iron. The stem, stem nut, disk ring, and seat ring shall be bronze. Bolts and nuts shall be rustproof steel.
3. Handwheel operator and floorstand shall be furnished where shown on the PLANS.
4. Provide stem guides for maximum unsupported stem length of 5 feet.
5. The valves shall be Clow F-3085, or equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. All valves and appurtenances shall be installed in the locations shown on the PLANS, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the ENGINEER before they are installed.
- B. After installation, all valves and appurtenances shall be tested at least 1 hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If a joint proves to be defective, it shall be repaired to the satisfaction of the ENGINEER.

- C. Install all brackets, extension rods, guides, the various types of operators and appurtenances as shown on the PLANS that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the CONTRACTOR shall check all plans and figures, which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.
- D. All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves and other equipment, which do not operate easily or are otherwise defective, shall be repaired or replaced at no additional cost the OWNER.
- E. Buried flanged or mechanical joints shall be made with cadmium plated bolts. All exposed bolts and nuts shall be cadmium plated. All exposed bolts and nuts shall be heavily coated with two (2) coats of bituminous paint comparable to Inertol No. 66 Special Heavy.
- F. Buried valves and valve boxes shall be set with the stem vertically aligned in the center of the gate box. Valves shall be set on a firm foundation and supported by tamping selected excavated material under the sides of the valve. The valve box shall be supported during backfilling and maintained in vertical alignment with the top flush with finish grade.

3.02 SHOP PAINTING

- A. Interior surfaces of all valves, the exterior surfaces of buried valves and miscellaneous piping appurtenances shall be given a shop finish of an asphalt varnish conforming to Federal Specification TT-V51e for Varnish Asphalt.
- B. The exterior surface of various parts of valves, operators, floor stands and miscellaneous piping shall be thoroughly cleaned of all scale, dirt, grease or other foreign matter and thereafter on shop coat an approved rust-inhibitive primer (such as specified in Section 09900) shall be applied in accordance with the instructions of the paint manufacturer.
- C. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating.
- D. Field painting is included under Division 9.

3.03 INSPECTION AND TESTING

- A. The various pipe lines in which the valves and appurtenances are to be installed are specified to be field tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable or the ENGINEER.

- B. Various regulating valves, strainer, or other appurtenances shall be tested to demonstrate their conformance with the specified operational capabilities and any deficiencies shall be corrected or the device replaced or otherwise made acceptable to the ENGINEER.

END OF SECTION

SECTION 15121

LEVEL SENSING AND CONTROL INSTRUMENTATION

PART I GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Level Sensing and Control Instrumentation:
 - a. Submersible Hydrostatic Level Transmitter
 - b. Float switches.
 - B. Level sensing equipment furnished as part of factory-fabricated equipment is specified as part of equipment assembly in other Division 15 sections.
 - C. Refer to Section 11820 for ultrasonic level sensing equipment.

1.02 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's technical product data, including installation instructions, for each instrument. Include scale range and ratings, certified where indicated.
 - 2. Instrument schedule showing manufacturer's figure number, scale range, location, and accessories for each instrument.
- B. Submit in accordance with Section 01300.

1.03 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of level sensing equipment, of types and sizes required, whose products have been in satisfactory use in similar service.
- B. Regulatory Requirements:
 - 1. UL Compliance: Comply with applicable UL standards pertaining to gauges.
 - 2. ANSI and ISA Compliance: Comply with applicable portions of ANSI and Instrument Society of America (ISA) standards pertaining to construction and installation of level sensing equipment.

- C. Certification: Provide equipment whose accuracies, under specified operating conditions, certified by manufacturer.

PART 2 PRODUCTS

2.01 SUBMERSIBLE HYDROSTATIC LEVEL TRANSMITTER

- A. Submersible level transmitters shall have a nominal operating range of zero to 30.0 ft. of water for process tanks and zero to ten feet of water for the plant sump, with a temperature range of 15 to 150°F, with compensated range of zero to 50°C. Accuracy of measurement shall be $\pm 0.5\%$ including linearity, hysteresis, and repeatability.
- B. Transmitter shall be constructed of polypropylene shell with a 316 L stainless steel diaphragm.
- C. Transmitter shall accept a supply voltage of 10 – 30 VDC with a 4 to 20 mA output signal. Electrical connection shall be to an attached three wire, 20 gauge polyethylene or PVC shielded cable.
- D. Transmitter shall be suspended within a 4" diameter stilling well attached to the basin wall. The stilling well shall contain equalization ports spaced as required. The stilling well shall be continuous from a point six inches above the floor to a point six inches below the top of the wall.
- E. Unit shall be a MJK Model 2100 Series Pressure Transmitter or approved equal.

2.02 FLOAT SWITCHES

- A. Float switches shall contain a hermetically sealed non-mercury microswitch housed in a polypropylene shell. It shall be designed for a life of 20 million operations.
- B. Floats shall be compatible with intrinsically safe installations. Electrical connection shall be to an attached three wire 17 gage PVC shielded cable.
- C. Switches shall be provided as normally open or normally closed as indicated on the drawings.
- D. Unit shall be a MJK Model 7030 Float Switch or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

15121-2

- A. Examine areas and conditions under which level sensing equipment is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.02 INSTALLATION OF PRESSURE INSTRUMENTATION

- A. Install level sensing instrumentation and ancillaries in a readily accessible location for observation and maintenance. Install per the manufacturer's recommendations.

END OF SECTION

SECTION 15122

PRESSURE SENSING AND CONTROL INSTRUMENTATION

PART I GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Pressure Sensing and Control Instrumentation:
 - a. Pressure gauges and transmitters
 - b. Pressure gauge cocks.
 - c. Diaphragm seals
- B. Gauges furnished as part of factory-fabricated equipment are specified as part of equipment assembly in other Division 15 sections.

1.02 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's technical product data, including installation instructions, for each type gauge. Include scale range and ratings, certified where indicated.
 - 2. Gauge schedule showing manufacturer's figure number, scale range, location, and accessories for each gauge.
- B. Submit in accordance with Section 01300.

1.03 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of gauges, of types and sizes required, whose products have been in satisfactory use in similar service.
- B. Regulatory Requirements:
 - 1. UL Compliance: Comply with applicable UL standards pertaining to gauges.
 - 2. ANSI and ISA Compliance: Comply with applicable portions of ANSI and Instrument Society of America (ISA) standards pertaining to construction and installation of gauges.

- C. Certification: Provide gauges whose accuracies, under specified operating conditions, certified by manufacturer.

PART 2 PRODUCTS

2.01 PRESSURE GAUGES

- A. Manufacturers include but are not limited to:
 - 1. Dwyer
 - 2. Ametek/U.S. Gauges.
 - 3. Marsh Instrument Company, Unit of General Signal.
 - 4. Weiss Instruments, Inc.
 - 5. Or approved equal.
- B. Provide pressure gauges of materials, capacities, and ranges indicated, designed, and constructed for use in service indicated.
- C. Type: WOG, 1 % accuracy, Grade A phosphor bronze bourdon type, bottom connection.
- D. Case: Enamel coated steel, 4-1/2 in. dia.
- E. Connector: Stainless steel with 1/4 in. male NPT.
- F. Scale: White coated aluminum with permanently etched markings.
- G. Range: Per Pressure Gauge Schedule on drawings.

2.03 PRESSURE SWITCH

- A. Same as for pressure gages:
- B. Provide pressure switch of materials, capacities, and ranges indicated, designed, and constructed for use in service indicated. Dwyer Series DA, or approved equal.
- C. Type: WOG, 403 SS bourdon type, bottom connection.
- D. Case: Pressed steel w. transparent cover, 5-3/4 in. dia.
- E. Connector: Stainless steel with 1/4 in. male NPT.

- F. Deadband: Adjustable
- G. Contacts: (3) Screw type
- H. Switch: Hermetically sealed contact mercury switch
- I. Range: 0-100 psi

2.04 PRESSURE GAUGE COCKS

- A. Manufacturers: Same as for pressure gauges.
- B. Provide pressure gauge cocks between pressure gauges and gauge tees on piping systems; or when applicable, between diaphragm seals and gauge tees on piping systems. Construct gauge cock of stainless steel with NPT fittings on each end of size and type consistent with the adjacent fittings, and with a "T" handle brass plug.
- C. Siphon: 1/4 in. straight coil constructed of type 304 stainless steel tubing with 1/4 in. male NPT on each end.
- D. Snubber: 1/4 in. stainless steel bushing with corrosion resistant porous metal disc through which pressure fluid is filtered. Select disc material for fluid served and pressure rating.

2.05 DIAPHRAGM SEALS

- A. Manufacturers: Same as for pressure gauges.
- B. Provide continuous-duty diaphragm seals between pressure gauges and gauge tees on process piping systems. Construct diaphragm seal of stainless steel with NPT fittings on each end of size and type consistent with the adjacent fittings.
- C. Type: Capsule with fill/bleed connection, glycerin filled.
- D. Diaphragm Material: 304L SS, w/ teflon coating
- E. Bottom Housing: 304L SS
- F. O-ring: Viton
- G. Range – Compatible with pressure gage, transmitter or switch.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions under which meters and gauges to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.02 INSTALLATION OF PRESSURE INSTRUMENTATION

- A. Install pressure instrumentation and ancillaries, located on pipe at most readable position, and adjust faces of gauges to proper angle for best visibility.

3.03 CLEANING

- A. Clean windows of instrumentation and factory-finished surfaces. Replace cracked or broken windows, and repair any scratched or marred surfaces with manufacturer's touch-up paint.

END OF SECTION



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