

416 W. THIRD ST. • P.O. BOX 535 • OWENSBORO, KENTUCKY 42302

270-683-7558 • FAX 270-683-9277

# TRANSMITTAL LETTER

To:	Beth O'Donnell Public Service Commission P.O. Box 615 Frankfort, KY 40602	Date: RE:	West Daviess County Water District West Louisville Community Elevated Water Storage Tank PSC Case No. 2007-00339	
We are	e sending you: Attached/Enclos	ed [	] Federal Express ] Faxed	
The fo	Ilowing items: Plans Survey Plat Drainage Information	Specifications Description Statement	<ul><li>☐ Technical Drawing</li><li>☐ Requested Information</li><li>☐ Shop Drawings</li></ul>	
Item N	No. Number of Copies		Description OR BID" Project Specifications booklet	
1	2		OK BID Troject specifications bookiet	

James R. Riney, PE, PS

Comments:

Copy: Bill Higdon James Rice/PSC RECEIVED

SEP 1 2 2007

PUBLIC SERVICE COMMISSION

# FOR BID

# WEST DAVIESS COUNTY WATER DISTRICT

WEST LOUISVILLE WELDED STEEL ELEVATED WATER STORAGE TANK PROJECT

> WX 21059022 SAI KY200611141439

PROJECT SPECIFICATIONS 2007

KENTUCKY INFRASTRUCTURE AUTHORITY CDF PROJECT

> PREPARED BY HRG, PLLC 416 W. Third Street Owensboro, KY 42301 270-683-7558

# WEST DAVIESS COUNTY WATER DISTRICT WEST LOUISVILLE WELDED STEEL ELEVATED WATER STORAGE TANK PROJECT WX 21059022 SAI KY200611141439

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#### NOTICE TO BIDDERS

Sealed bids will be received by West Daviess County Water District, 3400 Bittel Road, Owensboro, KY 42301, until 2:00 p.m. C.D.T. on Tuesday, October 2, 2007 for the following:

West Daviess County Water District West Louisville Welded Steel Elevated Water Storage Tank (500,000 gallon) KIA No. WX21059022

Bids are to be delivered to the West Daviess County Water District, 3400 Bittel Road, Owensboro, KY 42301, to be publicly opened and read at said location at 2:00 p.m. C.D.T. on Tuesday, October 2, 2007.

Project plans and contract documents may be examined at:

HRG, PLLC Surveying & Engineering 416 West Third Street
Owensboro, Kentucky 42301
Phone (270)683-7558

Contract Documents and Bid Forms may be obtained from HRG, PLLC Surveying & Engineering upon payment of Ninety-Five (\$95.00) Dollars. A Fifteen (\$15.00) Dollar refund will be made to all unsuccessful Prime Bidders upon return of all plans and documents unmarked and in good condition within 30 calendar days after the bid opening. Bids are of the unit price variety and shall be submitted on the forms provided and returned sealed in the official bid envelope.

No bids may be withdrawn for a period of Ninety (90) days after the bid opening date.

All bids must be accompanied by the Bid Bond or Cashiers Check in the amount of five (5) percent of the Total Base Bid and said surety shall be made payable to West Daviess County Water District. The successful bidder shall provide a Performance Bond and Payment Bond in the amount of one hundred (100) percent of the Total Base Bid.

West Daviess County Water District reserves the right to accept any bid, to reject any and all bids, to waive any irregularities or informalities in awarding the Contract, and to accept what in their opinion is the lowest, responsive, responsible and best bid. Further, West Daviess County Water District reserves the right to reject any Bid where evidence or information does not satisfy the OWNER that the Bidder is qualified to carry out the Project per Contract Documents, and to delete any Bid Item(s).

#### INSTRUCTIONS TO BIDDERS

Proposals are requested by West Daviess County Water District for the <u>West Louisville</u> <u>Welded Steel Elevated Water Storage Tank Project</u> and related work. The project is located in Daviess County, Kentucky.

1. Bidders shall inform themselves of all conditions under which the proposed project work is to be performed relative to but not limited to the site location, obstacles which may be encountered and other pertinent factors; by a visit to the site for personal examination, by a complete study of the Contract Plan, Project Specifications and Contract Documents, by personal interview as applicable with the Project Engineer and/or Project Owner.

Any revision or interpretation of the Contract Plans, Contract Specifications or Contract Documents will be made by addendum only and will be issued to each individual plan holder.

Quantities listed in the Bid Items, including the unit price Bid Items, are approximate only and may vary from the final in-place quantities. Final payment due to the Contractor will be based on in-place measured quantities for unit price items. Bid proposals, however, will be compared on the basis of the approximate quantities included in the Proposal.

The Bidder's attention is called to the Wage Rate Section of the Specifications.

Any Bidder may withdraw his Proposal at any time prior to the scheduled bid closing time. No Project Proposals may be withdrawn after this time except as stated in the Notice for Bids.

Proposals shall be submitted on the Project Proposal Forms furnished by the Owner without change or alterations. Each Proposal shall be submitted with the cashiers check or BID BOND in the amount of five (5) percent of the total bid price. Bid Bonds shall be issued by a company with a licensed agent. A PERFORMANCE and PAYMENT BOND (surety bond) shall be furnished by the successful Bidder in the amount of one hundred (100) percent of the total contract price.

Only those proposals which have been properly completed, signed and appropriate Bid Security provided will be considered and read.

2. **Preparation of Bid**: Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures. Facsimile (i.e. fax) bid proposals will not be accepted.

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 the written "Notice to Proceed" of the Owner and to fully complete all work by **June 1, 2008.** Bidder must agree also to pay as liquidated damages, the sum of **\$100.00** for each consecutive calendar day thereafter as hereinafter provided in the General Provisions.
- 10. Conditions of Work: Each bidder shall 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 to carry out the provisions of his/her contract. Insofar as possible, the Contractor, in carrying out the work, must employ 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 James R. Riney at P.O. Box 535, Owensboro, Kentucky, 42302 and to be given consideration must be received at least five (5) days prior to the date established 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 (3) days prior to the date established for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from the 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 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 Provisions. The surety on such bond shall be a duly authorized surety company satisfactory to the Owner. The surety bond shall remain in effect for one full year after receipt of final payment by the Contractor.
- 13. **Power of Attorney**: Attorneys-in-fact who sign bid documents or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney. Power of Attorney shall include a licensed agent.
- 14. **Notice to Special Conditions**: Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

# **CONTRACT**

THI	IS AGREEMENT made and entered into this day of, 2007
by a	and between West Daviess County Water District, hereinafter called "OWNER" and
	doing business as a (insert
appı	ropriate term: individual, partnership, corporation, etc.), hereinafter called
"CC	ONTRACTOR".
W	ITNESSETH:
(1)	That the Contractor, for the consideration hereinafter set out, hereby agrees to commence and complete the construction of <u>West Louisville Welded Steel Elevated Water Storage Tank Project</u> .
(2)	The Contractor will furnish all labor, equipment, materials and incidentals necessary to complete the herein described Project per Contract Plans and Specifications.
(3)	The Contractor shall commence the work to be performed under this agreement within ten (10) days of receipt of Notice to Proceed and shall be fully completed by <b>June 1, 2008.</b>
(4)	The Contractor agrees to perform all the work defined in the Contract Documents and Plans for the sum of \$\sqrt{\sq}}}}}}}}}}} \sqrt{\synt{\sqrt{\synt{\synt{\sqrt{\synt{\sqrt{\sqrt{\synt{\synt{\synt{\synt{\synt{\synt{\synt
(5)	Upon completion of the project work the Contractor shall formally notify the Owner and Engineer requesting final inspection of the project. Upon satisfactory review and acceptance of the work by the Owner and Engineer and when the Contractor furnishes evidence of all supply, materials and other bills for the Project have been satisfactorily paid, the Contractor shall be paid in full within thirty (30) days.
	Final payment will be withheld, in the amount of damage or estimated costs for any incomplete or unsatisfactory work requiring: repairs to public or private property, inspection and/or engineering costs, liquidated damages or unpaid bills associated with this project.

	CONTRACTOR:
	BY:Signature
	Printed Name
	TITLE:
ATTEST:	
NAME:	
TITLE:	
(Owner's Seal)	(Contractor's Seal)

#### SPECIAL CONDITIONS

#### 1. OMPC Public Improvements Specifications

All conditions and requirements of construction and implementation contained in the "Public Improvement Specifications" as issued in August 2002 by the Owensboro Metropolitan Planning Commission (OMPC) must be complied with on this project and are hereby incorporated by reference. Copies may be obtained from the OMPC office located at 200 E. Third Street (second floor of Chase Bank building) or by downloading from the OMPC web page (<a href="www.iompc.org">www.iompc.org</a>).

# 2. Tank Inspection and Geotechnical Inspection

The Consultant will provide routine construction review and coordination. Specialized tank construction, fabrication, surface preparation and coating application will be provided by "Wet or Dry Tank Inspection Company" (Jay L. Hoffman). Geotechnical compliance and routine on-site review will be provided by Hanson Testing and Engineering.

The Contractor shall fully and continuously coordinate, schedule and check all work with the inspection representatives. Primary coordination and all information/schedule activities shall be through the Consultant.

#### 3. KY State Clearinghouse Comments

Conditions and criteria contained in the State Clearinghouse comments shall be applicable and binding on this Contract; being incorporated herein by reference (see Appendix C).

#### 4. Supplemental Tank Coating Requirements

**Shop Surface Preparation**: Prior to surface preparation, all surfaces shall be cleaned or all oil and grease in accordance with SSPC-SP 1 Solvent Cleaning. All interior and exterior surfaces shall be sand blasted to remove all dust, rust and scale, as well as all other foreign matter and shall result in a surface preparation equal to that of SSPC-SP 10 Near White Blast Cleaned Surface. Surface profile shall be 1.5 - 2.5 mils.

Following surface preparation, all interior and exterior surfaces shall receive one coat of primer as hereinafter specified. The primer shall be applied in accordance with the recommendations of the manufacturer and not more than eight hours after surface preparation.

**Field Cleaning**: After erection and prior to painting, all interior and exterior surfaces shall be cleaned of all grease, oil, dirt, dust, rust, chalk residue, weld flux and spatter, and all other foreign matter or contaminants. All field welded edges and joints, as

#### C: Induron

Induron PE-54 Epoxy Prime to a DFT 3.0 - 5.0 dry mils

Tan

Intermediate Induron PE-54 Epoxy to a DFT of 3.0-5.0 mils.

Gray

Finish Induron PE-54 Epoxy to a DFT of 3.0-5.0 mils

White

All weld seams shall receive an additional roll coat to a DFT of 5.0 mils

Prior to finish application White

Total DFT shall not be less than 9 Mils not including the weld seams which shall be a minimum of 5 mils greater.

#### **Tank Exterior:**

#### A. Rust-Oleum Industrial

Rust-Oleum 9380 to a DFT of 3-5 mils

Gray

Rust-Oleum 9370 to a DFT of 3-5 mils

Buff

Rust-Oleum 9400 to a DFT of 2-3 mils

White

DFT shall not be less than 10 mils

#### B. Tnemec Co

Tnemec Series 69 to a D.F.T. of 3.0-5.0 mils.

Red

Tnemec Series 69 to a D.F.T. of 3.0-5.0 mils.

Beige

Tnemec Series 73/74 to a D.F.T. of 3.0-5.0 mils.

White

DFT of the exterior 9 mils

# C: Induron

Induron PE-54 Epoxy Prime to a DFT 3.0 - 5.0 dry mils

Tan

Induron Armorguard Epoxy to a D.F.T. of 3.0 - 5.0 dry mils.

Gray

e. Effective oil and water separators, and a air drier shall be used in all lines serving spray painting and abrasive blasting operations to remove oil and moisture from the compressed air.

# **Mixing of Coatings:**

1.3. Owner shall designate an area where all coatings shall be stored and mixed only. All mixing shall be done over a double tarped area. Any and all spills shall be reported to the Owner immediately at the time of incidence. Contractor shall bear responsibility, as well as all costs associated with cleanup and removal of any contaminated area (s).

# 1.1 Painting

- a. Skilled, experienced painters on properly prepared surfaces shall do all painting. All surfaces, which are not to be coated, shall be protected.
- b. The CONTRACTOR shall be responsible for the compatibility of all paints used in work.

# 2.2 Ventilation

- a. Ventilation is essential to remove vapors during application and curing of coatings.
- b. Ventilation shall be exhausted from lowest portion of tank with top openings kept clear.
- c. During coating applications the capacity of the ventilating fans shall be at least 400 cfm per gallon of coating applied per hour.
- d. The ventilation requirements are to ensure proper curing of the applied coatings and are not to be taken as requirements to insure worker safety.
- e. Following the application of the final interior coating the tank shall be force ventilated by mechanical means from the lowest possible point for a minimum of 48 hours, ventilation shall be such that it creates a total turn over on the interior of the tank a least once per hour.

#### 2.3 Quality Assurance

#### A. Manufacture:

Provide products manufactured by the following:

- 3. Manufactures name
- 4. Contents by volume
- 5. thinning instructions
- 6. Application instructions
- 7. Color name and number

#### B. Storage of materials:

- 1. Store only acceptable project materials on project site
- 2. Store according to manufactures recommendation
- 3. Comply with all State and Federal health and fire hazard regulations.
- 4. MSDS sheets shall be in a bound set on job-site at all times, available to emergency personnel if required.

## 2.6 Environmental Requirements for application of coatings

- 1. Apply paints only when temperature of surfaces to be painted and surrounding air temps are between 55 and 90 degrees Fahrenheit unless otherwise permitted by paint manufactures printed instructions.
- 2. Application of coatings will not be permitted in snow, rain, fog, mist or when the relative humidity exceeds 85%; or when the surface temp of substrate is less than 5 degrees Fahrenheit above the dew point; or to damp or wet surfaces.
- 3. Painting will not be allowed during periods of inclement weather.
- 4. The CONTRACTOR at all times shall provide adequate illumination in areas where painting operations are in progress. **Lighting shall be OSHA approved and explosion proof**.

#### 3.1 Disinfection

After curing at least the minimum number of days required by the paint manufacture, the CONTRACTOR shall wash the Head tank interior with an adequate volume of water to thoroughly wet all the interior surfaces including those above the high water level. All water will be removed and disposed of in accordance with approved regulations.

1. It is the CONTRACTORS responsibility after washing and curing to completely disinfect the interior portion of the tank, of AWWA C652-961. It is the CONTRACTORS responsibility after washing and curing to completely disinfect the interior portion of the tank, AWWA C652 Method 2 ONLY. If acceptable to KY Division of Water, If not acceptable then method 1 or 3 shall be used at no additional expense to owner. The Owner shall take and send water samples to the laboratory, but shall assume no responsibility for the sampling technique or the care of the samples.

# **SECTION 1**

# **GENERAL PROVISIONS**

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	<ol> <li>Drives, Entrances, etc.</li> <li>Tree Removal</li> </ol>	

#### Contractor

The individual, partnership, firm, or corporation, contracting with the Owner for performance of the prescribed work.

### **Engineer**

The Project Engineer as designated by the Consultant and his duly appointed agents or representatives.

#### **Equipment**

All machinery and equipment, together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and acceptable completion of the work.

#### Inspector

The Engineer or an authorized representative thereof assigned to make periodic inspections of contract performance.

#### **Notice to Proceed**

Written notice to the Contractor to proceed with the contract work including, when applicable, the date of beginning of contract time.

#### Owner

West Daviess County Water District, 3400 Bittel Road, Owensboro, KY 42301, Phone 270-685-5594.

#### **Plans**

The approved plans, profiles, and related drawings, or exact reproductions thereof, which show the location, character, dimensions, and details of the work to be done. Standard Drawings are drawings approved for repetitive use, showing details to be used where appropriate. Individual standard drawings attached to, or cited in, the plans or proposal become a part of the contract.

#### **Project**

The 500,000 gallon welded steel elevated water storage tank, water main connection and extension, site work, fencing and associated construction to be performed thereon under this Contract.

#### **Proposal**

The offer of a bidder, on the prescribed form, to perform the work and to furnish the labor and materials at the prices quoted.

#### **Specifications**

A general term applied to all directions, provisions, and requirements pertaining to performance of the work.

The Owner reserves the right to reject any bid proposal submitted by a company or individual who has provided inferior, inadequate, incomplete or unsatisfactory work to the Owner in the past.

A financial statement from the Bidders may be required by the Owner in order to assist in the bid review, the analysis of acceptability and the ultimate bid award determination. Unsatisfactory demonstration of financial ability to engage and complete the project will result in rejection of the bid.

#### **Interpretations of Bid Quantities**

The quantities appearing on the Bid Form are estimated quantities only and are prepared for the comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished in accordance with the contract. The estimated quantities or work to be done and materials to be furnished may each be increased, decreased, or omitted as provided herein.

#### Examination of Plans, Specifications, and Project Site

The bidder is expected to examine carefully the site of the proposed work, the proposal, plans, specifications, contract forms and related documents, before submitting a proposal. The submission of a bid shall be considered prima facie evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the contract. Profession of ignorance or misunderstanding regarding requirements of the work will in no way serve to modify the provisions of the contract.

#### **Preparation of Proposal**

The bidder must submit his proposal upon the forms furnished by the Owner. The bidder shall specify a unit price in figures for each pay item for which a quantity is given and shall also show the products of the respective unit prices and quantities written in figures in the column provided for that purpose and the total amount of the proposal obtained by adding the amounts of the several items. All figures should be in ink or typed. The bidder's proposal must be signed in ink by the individual, by one or more members of the partnership, or by one or more officers of a corporation, or by an agent of the Contractor legally qualified and acceptable to the Owner.

#### **Irregular Proposals**

Bids will be considered irregular and will be rejected when the bidder omits a unit price for any pay item and an amount for the entire quantity of the same pay item. Proposals will considered irregular and may be rejected for any of the following reasons:

(a) When the proposal is on a form other than that furnished by the Owner; or when the form is altered or any part thereof is detached; or

#### **Award of Contract**

Unless all bids are rejected, the contract will be awarded to the lowest, responsive, responsible and best bidder, without discrimination on the grounds of race, creed, color, sex, or national origin, whose proposal complies with the requirements of the law and the project specifications.

# **Contract Bond**

Within ten (10) calendar days after the Notice of Award has been received by the bidder and at the time of execution of the contract, the successful bidder shall execute a performance and payment bond on a form acceptable to the Owner, in the penal sum of 100 percent of the amount of the contract, with a surety to be approved by the Owner. Contract bonds shall be conditioned upon the faithful performance of the requirements of the contract and any modifications thereof in conformity with the proposal, plans, and specifications; payment of proper compensation under the required labor and wage conditions as provided in the contract; and payment of claims against the Contractor for materials, labor and supplies. The contract bond shall be kept in full force for a period not less than one (1) full year after the date when final payment is made to the Contractor. The bonds shall be issued by a company with a Kentucky authorized contracting agent.

#### **One-Year Warranty Period**

The Contractor must guarantee all work for a period of one (1) year and shall promptly make corrections or adjustments which may be necessary to correct defects including repairs of any damages to other parts of the system resulting from such defects. Payment by the Owner does not constitute a waiver of the Owner's claims against the Contractor. The Contractor's One-Year Warranty period shall commence on the date of the final payment check issued by the Owner.

#### **Execution of Contract**

The bidder to whom the contract is awarded shall, within ten (10) calendar days after receiving the Notice of Award, execute and file with the Engineer the contract, accompanied by the following items:

- (a) The contract bonds specified hereinabove; and
- (b) Satisfactory evidence of required insurance coverage.

# 1.4. SCOPE OF WORK

# **Intent of Contract**

The intent of the contract is to provide for the construction and completion in every detail of the utility mains, grade, drain, surface and appurtenances. The Contractor shall furnish all labor, materials, equipment, tools, transportation, supplies and incidentals necessary to complete the work in accordance with the plans, specifications, and terms of the contract.

#### **Storage of Materials**

Materials shall be stored by the Contractor so as to ensure preservation of their quality and fitness for the work. Stored materials shall be located so as to facilitate prompt inspection.

# 1.6. LEGAL CONSIDERATIONS AND INSURANCE

#### Laws to be Observed

In all operations connected with the work, all Federal, State, and local laws, regulations and ordinances controlling or limiting in any way the actions of those engaged on the work shall be strictly complied with by the Contractor and all his employees or subcontractors, in such manner as to save the Owner, its agents, and its employees harmless.

The Contractor shall not discriminate against any worker because of race, creed, color, sex, national origin, or age.

#### Safety, Health, and Sanitation

The Contractor shall comply with all applicable Federal, State, and local laws and regulations governing safety, health, and sanitation. The Contractor shall provide all safeguards, safety devices, safety fences, and protective equipment and shall take all other needed actions which are determined to be reasonably necessary to protect the life and health of all employees and personnel on the project, provide for the safety of the public, and protect all property affected by the performance of the work covered by the contract.

As provided in KRS Chapter 338 in the Kentucky Occupational Safety and Health Act and in subsequent regulations and standards promulgated by the Kentucky Occupational Safety and Health Standards Board, the Contractor shall not require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety.

#### Licenses, Fees, and Permits

Unless specified otherwise in the Special Conditions, the Contractor shall be responsible for the securing and the payment of any applicable licenses, fees, or permits. The cost of such items shall be considered incidental to completion of the work specified and no additional compensation will be made for such items.

#### **Insurance Requirements**

The Contractor shall not commence site work under this Contract until all insurance requirements specified herein have been acquired and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on

**Proof of Carrying Insurance**: The Contractor shall furnish the Owner with satisfactory proof of coverage of the insurance required, with a reliable company or companies, before commencing work. Such proof shall consist of certificates executed by the respective insurance companies and filed with the Engineer.

#### Indemnification

The Contractor shall indemnify and hold harmless the Owner, agents, or employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from the performance of the work, provided that any such claim, damage, losses, or expenses (a) is attributable to bodily injury, sickness, disease or death, or attributable to injury to, or destruction of, tangible property (other than the work itself) including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of the Contractor, anyone directly or indirectly employed by the Contractor, or anyone for whose acts the Contractor may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

In any and all claims against the Owner and its affiliated companies or any of its agents or employees by any employee of the Contractor, or anyone directly or indirectly employed by the Contractor or anyone for whose acts the Contractor may be liable, the indemnification obligation under the above paragraph shall not be limited in any way by the limitation payable by or for the Contractor under Workman's Compensation Acts, disability benefit acts, or other employee benefit acts.

Any provisions of this Contract in respect to indemnification which are prohibited or unenforceable by law shall be ineffective to the extent of such prohibition or unenforceability, and shall not invalidate the remaining provisions of this Agreement.

# 1.7. CONTRACT PROSECUTION AND PROGRESS

#### **Subcontracting of Contract**

The Contractor shall not subcontract, sell transfer, assign, or otherwise dispose of the contract, or any portion thereof, or of his right, title, or interest therein, without written consent of the Owner. When such consent is given, the Contractor will be permitted to subcontract a portion thereof, but will perform with his own organization work amounting to no less than fifty-one (51) percent of the total contract cost. No subcontract shall in any case release the Contractor of his liability under the contract and bonds. All transactions of the Engineer will be with the Contractor.

#### **Preconstruction Conference**

After the contract is awarded, the Engineer will schedule a preconstruction conference. At this conference, the Contractor shall be prepared to discuss the planned sequence of major operations to be performed on the project, and provide any relevant information as requested by the Engineer.

# Failure to Complete on Time

For each calendar day, excluding weekends and legal holidays, that the work remains incomplete after the specified completion date, the Contractor shall pay to the Owner the sum of \$100.00 (One Hundred Dollars) in daily charges (per each calendar day), not as a penalty but as agreed liquidated damages. Daily charges as agreed liquidated damages shall be deducted from any money due the Contractor, if not previously paid by the Contractor.

# **Conflicting Contract Document Conditions**

In the event of conflicting requirements within the Contract Documents, applicable laws, regulations or policies the more stringent interpretation shall prevail. In the event of conflict of interpretation between the Owner and the Contractor then the decision of the Project Engineer shall be final.

The Contractor's attention is called to the provision listed below regarding engineering/surveying work provided at overtime occasions, provided after the scheduled completion date or under similar circumstances. The Owner will provide control layout, construction inspection and related work via the Consultant, based on normal working hours of the firm. All engineering inspection, or survey crew personnel will be furnished Monday through Friday (except holidays) between the hours of 7:30 a.m. and 4:00 p.m. by the Owner at no cost to the Contractor. Actual construction layout and staking shall be provided by the Contractor.

The Contractor shall pay for all overtime furnished by the consultant at the Consultant's Hourly Rate for the respective personnel. Overtime charges will be assessed against the Contract for work occurring during the Contract period. In addition, the overtime rates hereinabove described shall be assessed against the Contractor for any and all work and for each hour of work performed by the Consultant beyond expiration of the Contract completion date. Payments of all costs assessed to the Contractor for overtime or excess work provided by the Consultant will be deducted from payments due the Contractor if not previously paid in full by the Contractor during the time covered by the respective periodic payment requests. The Contractor is responsible for the cost of replacing damaged construction and layout staking and/or control points.

The Owner maintains at any and at all times the right of entry upon and to the job site(s). This right shall be extended by the Owner to include representatives of the Consultant and to State/Federal agencies.

The Contractor shall notify the Engineer immediately of control point (staking) which are inconsistent or which do not appear to be in compliance with the Plans. The Contractor shall suspend construction operations for any section or area of work where he discovers or feels there is such an inconsistency until the conflict is resolved by the Engineer.

At least one full working day notice shall be given by the Contractor to the Engineer when construction control is required for each phase or section of construction.

#### 1.10. SUBSURFACE AND GROUNDWATER CONDITIONS

No assurance is given or implied regarding the nature or character of the subsurface conditions at the site. The Bidder is advised to perform whatever excavation, borings or similar work he deems necessary in order to best determine subsurface conditions. Unless otherwise noted in the Project Special Conditions, no direct payment will be allowed for work required due to subsurface and/or groundwater conditions.

# **SECTION 2**

# **EARTH WORK**

Section	<u>Item</u>	<u>Page</u>
2.1	Clearing and Grubbing	TS-2
2.2	Excavation	TS-2

Excavation and fill placement shall be performed in a manner to provide positive drainage and in order to maintain a well-drained site. Daily work areas shall be graded to drain and when directed shall include temporary drains, swales or diversions installed at the Contractor's expense for protection of the site and/or adjacent areas.

Final grading, shaping and finishing shall be to a uniform line and grade to a tolerance on 0.20 foot. The final graded site shall be free of ponding or settlement area. The site shall be filled, leveled and final graded as many times as necessary to provide a uniform, well drained area at no additional compensation to the Contractor.

#### 3.1. EROSION CONTROL

Erosion control and sediment containment shall be performed in general conformance with the "Kentucky Best Management Practices for Construction Activities"; prepared by the Division of Conservation and the Division of Water, Natural Resources and Environmental Protection Cabinet; dated August 1994 or most recent revision.

#### 3.2. EROSION CONTROL PROCEDURES

#### **Construction Areas**

Site excavation and grading shall proceed in an orderly and practical manner as necessary to implement the site grading work and in order to avoid trapping water on the project site. Daily work areas shall be graded to drain. Work will be performed in a manner to minimize soil erosion and downstream siltation as described herein. The final site grading shall result in a uniformly graded surface and free of ponding areas.

#### **Control Procedures**

- (a) Erosion control techniques shall include silt checks (straw bales, rock checks, timber dams, earthen dams, etc.) diversion ditches, silt traps or similar methods. Silt checks and silt fences shall be maintained and remain in-place until ground cover/re-vegetation has been established.
- (b) Upon completion of construction/earthwork within a drainage basin area, the site shall be final shaped to drain and temporary seeding/fertilizer applied. Temporary seeding and/or final seeding shall be placed within seven (7) days after completion within a work area.
- (c) Seed areas shall receive a straw or organic cover (approximately 2" loose depth) after seeding of disturbed areas.
- (d) Storm run-off routes and sediment traps shall be monitored and sediment periodically removed for continued collection of upstream sediment.

#### **Silt Basins**

Any necessary silt basins shall be built prior to any site clearing or grading work; except for construction of diversions, silt basins, or necessary access roads.

#### Maintenance

The Contractor shall be required to clean out (remove sediment from) silt checks, silt traps and retention basins whenever they become one-half full, and properly dispose of the materials at site as often as required by the Engineer.

#### 4.1. TANK CONSTRUCTION

# 1.0 GENERAL REQUIREMENTS

#### 1.1 Scope

The Contractor shall be responsible for all labor, materials and equipment necessary for the design, fabrication, construction, painting, disinfection and testing of an elevated welded steel water storage tank supported by a series of supporting columns and cross bracing. This style of tank is commonly referred to as a "Multi-Column" Tank. Design and construction of the Elevated Tank shall conform to all requirements of AWWA D100 Standard for Welded Steel Tanks for Water Storage except as modified by the requirements of these contract documents.

# 1.2 Qualification of Manufacturer

The design and construction of the "Multi-Column" elevated welded steel water storage tank shall only be undertaken by a Contractor with a minimum of five years experience with elevated tank construction. The Contractor must be able to demonstrate experience through the design and construction of at least ten "Multi-Column" elevated water tanks within the last five years. The Contractor shall not subcontract either the design or erection of the steel tank and support structure. Divided responsibilities between erection and fabrication will not be allowed.

#### 1.3 Submittals

The bidder shall submit with his proposal:

- 1. A list of ten "Multi-Column" elevated tanks constructed within the last five years including the Owner, tank capacity, the Engineer and contact information.
- 2. A preliminary drawing of the tank showing major dimensions and plate thickness upon which the bid is based, the high and low water levels and the dimensions of the supporting tower.
- 3. A foundation design drawing showing preliminary dimensions and approximate quantities of concrete and reinforcing steel.

No bid will be considered unless this information is provided with the bid.

# 1.7 Working Drawings

After contract award and prior to construction, the Contractor shall provide working drawings and design calculations for the elevated steel tank and the foundation. Drawings shall show the size and location of all structural components and reinforcement, the required strength and grade of all materials, and the size and arrangement of principle piping and equipment. The drawings and calculations shall be certified by a professional Engineer licensed in the State of Kentucky. The design coefficients and resultant loads for snow, wind and seismic forces, and the methods of analysis shall be documented.

#### 2.0 DESIGN

#### 2.1 General

The structural design of the elevated storage tank shall conform to the following design

standards except as modified or clarified as follows:

- a. Foundations AWWA D100 and ACI 318 Building Code Requirements for reinforced concrete.
- b. Steel Tank AWWA D100
- c. Steel Tank Painting AWWA D102

Tank design and construction features shall be in accordance with Kentucky Division of Water criteria and regulations and local Building Inspector's office requirements including but not limited to the Kentucky Building Code.

#### 2.2 LOADS

#### 2.2.1 Seismic Load

Design in accordance with AWWA D100-96, Section 13. The following factors shall be used:

Seismic Zone =  $\underline{\text{Zone Two (2)}}$  unless otherwise specified by local code requirements.

All other factors shall be in accordance with Section 13.

# 3.0 CONSTRUCTION

#### 3.1 Concrete Foundation

The foundation shall be designed and constructed to safely and permanently support the structure. The basis of the foundation construction shall be commensurate with the soils investigation data included herein at the end of these specifications. Appropriate changes to construction schedule and price will be negotiated if, during excavation, soil conditions are encountered which differ from those described in geotechnical report. The concrete foundation shall be constructed in accordance with ACI 301. Minimum concrete compressive strength shall be as specified in Section 10, "Cast-In-Place Concrete".

#### 3.2 STEEL TANK CONSTRUCTION

#### 3.2.1 General

The erection of the steel tank shall comply with the requirements of Section 10 of AWWA D100 except as modified by these documents.

All parts forming the structure shall be built in accordance with reviewed shop drawings prepared by the Contractor. The workmanship and finishing shall be the best in modern shop practice. Welding must be done by operators who have been qualified within the previous year, in accordance with the requirements of the American Welding Society. Records of these qualification tests shall be available to the Engineer. The work at all times shall be open to the Engineer or his representative.

Upon completion of the tank erection, the Tank Contractor will remove or dispose of all rubbish and other unsightly material caused by its operation, and will leave the premises in good appearance.

#### 3.2.2 Welding

All shop and field welding shall conform to AWS and AWWA D100, Section 10. Before any welding is performed, the constructor shall make certain that the welders or welding operators have their credentials for acceptance.

#### 3.2.3 Fabrication

All fabrication and shop assembly shall conform to the requirements of AWWA D100, Section 9, Shop Fabrication.

provided under this contract. The Contractor shall construct all temporary excess roads necessary to install the tank. Erosion control measures must be taken to insure proper drainage of nearby property and creeks.

#### 4.2 Ladders

Access ladders shall be provided at the following locations:

- a) The tower ladder shall extend up one column from near the base connecting with the balcony. The first rung shall be located approximately 12 feet above top of foundation. The ladder shall be equipped with an anti-climb device approved by the Owner.
- b) An outside tank ladder from the balcony to the roof hatch.
- c) An inside tank ladder from the roof hatch to the inside bottom of the tank.
- d) An inside riser ladder from the base of the riser to the bottom of the tank.

Ladder side rails shall be a minimum 3/8-inch by 2 inches with a 16-inch clear spacing. Rungs shall be not less than 3/4 inch, round, spaced at 12-inch centers. The surface of the rungs shall be knurled, dimpled or otherwise treated to minimize slipping. Ladders shall be secured to adjacent structures by brackets located at intervals not exceeding 10 feet. Brackets shall be of sufficient length to provide a minimum distance of 7 inches from the center of the rung to the nearest permanent object behind the ladder.

#### 4.3 Fall Protection

Ladders shall be equipped with a cable type safety climb system meeting OSHA regulations. The system shall be supplied complete with safety harnesses, locking mechanisms, lanyards and accessories for two persons.

#### 4.4 Balcony

The tank shall be equipped with a balcony not less than 36" wide with a handrail not less than 42" high. The floor shall be perforated for drainage. The balcony floor shall be designed for a minimum vertical load of 1,000 pounds assumed to be applied at any point. The handrail shall be capable of withstanding 300 pound load applied laterally at the top rail.

#### 4.5 OPENINGS

#### 4.5.1 Roof Hatches

Provide two access hatches on the roof of the tank. One hatch shall be 30-inch x 30-inch and allow access from the roof to the interior of the tank. The hatch will be hinged and equipped with a hasp for locking. The hatch cover shall have a 2-

approximately 1 to 2 feet above grade and discharge onto a concrete splash pad. The point of discharge shall be equipped with a Tide-Flex series 35 valve.

#### 4.8 Identification Plate

A tank identification plate shall be mounted on the tank riser pipe above the access manhole. The identification plate shall be corrosion resistant and contain the following information.

- a) Tank Contractor
- b) Contractor's project or file number
- c) Tank capacity
- d) Height to High Water Level
- e) Date erected

#### 5.0 GUARANTEE

The tank Contractor shall guarantee its work for a period of one year from the date that final payment is issued to the extent that it will repair any defects caused by faulty design, workmanship or material furnished under the specifications. If Contractor is not advised of any defects by the end of the guarantee period, guarantee shall be considered fulfilled and complete. Defects caused by damaging service conditions such as electrolytic, chemical, abrasive or other damaging service conditions are not covered by this guarantee.

All guarantees obtained by the tank Contractor from the manufacturer or installer of paint, equipment or accessories not manufactured by tank Contractor shall be obtained for the benefit of the Owner.

#### 6.0 TELEMETRY

The Contractor shall provide and install one (1) base plate for the purpose of mounting telemetry controls located on the balcony railing as specified by the Engineer. A 1" conduit for the telemetry shall be installed from the balcony railing to a specified point on the base leg. The telemetry components and wiring shall be installed under a separate contract by the Owner.

# 7.0 WATER LEVEL INDICATOR

The Contractor shall provide and install a water level indicator at the new 500,000-gallon tank. The level indicator shall show Full, 3/4, 1/2, 1/4, Empty. All metal parts shall be painted with the same type and conditions as the 500,000-gallon tank. All cable shall be stainless steel. The indicator assembly shall be

# 1.4 Quality Control

- 1. Only paint and painting materials as specified shall be used.
- 2. Paint shall be delivered in unbroken containers bearing the designated name, specification number, color, directions for use, manufacturer and date of manufacture.
- 3. All manufacturers' instructions shall be carefully followed in the preparation, application, curing or drying and handling of the paint.
- 4. All prime, intermediate and finish coating materials shall be applied in different color shades.
- 5. Paint shall be stored in a location that is protected from the elements, well ventilated and free from excessive heat or open flame sources.
- 6. The contractor shall obtain the Inspector's written approval of the steel surface preparation and of each coat of paint, before applying succeeding coats. Such approval will not relieve the contractor of his obligations under the contract. Inspections may be waived by written notice to the contractor.
- 7. The contractor shall record environmental conditions, at the beginning of each daily operation, thirty minutes before painting beings and every hour during painting operations, on the attached Environmental Conditions Report.
- 8. Painting shall be performed by skilled painters using the materials and methods specified.
- 9. All coatings shall be petroleum based. Water based coatings are unacceptable.

#### 1.5 Health and Safety

The Contractor shall comply with all regulations as established by the Occupational Safety and Health Act and other government authorities. Up to date Material Safety Data Sheets shall be available on site for all products used. Workers shall wear proper protection devices. Where ventilation is used, all equipment shall be explosion proof. Temporary ladders and scaffolding systems shall conform to applicable safety requirements. It shall be the responsibility of the Contractor to adequately protect, shield or cover all structure, machinery, equipment and openings as required to prevent damage or contamination from the work procedures. The work area shall be kept clean at all times, consistent with the type of work being performed.

#### 1.6 Testing

Dry Coating thickness measurements shall be made using a Magnetic Gauge. Tolerances to be in accordance with SSPC-PA 2 Measurement of Dry Coating Thickness with Magnetic Gauges. Additional coats shall be applied as required to obtain the specified thickness. The Contractor will be required to perform Holiday Testing as soon as the work is sufficiently cured according to the manufacturer's recommendations. All pinholes and deficiencies will be repaired.

# 2.4 Paint Application

Coating materials to be applied in successive coats as specified by the manufacturer to attain the required dry film thickness for each system. Coatings to be applied without sags, foreign materials contamination or blemishes. Acceptable manufacturers include:

Sherwin Williams Tnemec Carboline

# 2.5 Shop Prime

Apply prime coat after blast cleaning and prior to flash rusting. If rust appears as a result of delay in primer application the surface shall be reblasted to specified surface preparation. A six-inch strip of blasted uncoated bare steel shall be left between the primed area and the edge of the steel plate.

#### 3.0 COATING SYSTEMS

# 3.1 Interior Wet Coating

Interior wet coating systems will be applied within the following dry film thickness:

Prime Coat – One coat High Solids Epoxy by spray to a dry film thickness of 2-3 mils.

Weld Seams —High Solids Epoxy Brush apply to a dry film thickness of 2-3 mils. Intermediate Coat - One coat High Solids Epoxy by spray to a dry film thickness of 4-5 mils.

Finish Coat – One coat High Solids Epoxy by spray to a dry film thickness of 4-6 mils.

Minimum DFT of paint system for interior wet coating to be 10 mils.

# 3.2 Exterior Coating

Exterior coating systems will be applied within the following dry film thickness:

Prime Coat – One coat epoxy Primer by spray to a dry film thickness of 2-3 mils. Weld Seams – Epoxy Primer Brush apply to a dry film thickness of 2-3 mils. Intermediate Coat – One coat High Solids Epoxy by spray, brush or roller to a dry film thickness of 4-6 mils.

# **ENVIRONMENTAL CONDITIONS REPORT**

Project:	

DATE	TIME	AIR TEMP.	SURFACE TEMP.	HUMIDITY	DEW POINT

Section	<u>Item</u>	<u>Page</u>
5.19	Salvage Materials and Items	TS-38
5.20	Tracer Wire	TS-38
5.21	Tracer Wire Material	TS-38
5.22	Final Inspection	TS-38
5.23	Proximity to Existing Sewer Mains	TS-39
5.24	Meter Setter Change-Out (PRV//Double Check)	TS-39

#### **Ductile Iron Pipe**

Ductile iron pipe for watermains shall conform to the requirements of AWWA Standard C-151 "Ductile-Iron Pipe, Centrifugally Cast Inmetal Molds or Sandlined Molds, for Water or Other Liquids" and AWWA Standard C-150 "Thickness Design of Ductile Iron Pipe". Rubber gaskets and pipe joints shall conform to requirements of AWWA Standard C-111 unless special gasket requirements are noted on the construction plans.

#### Pipe Characteristics for the Project

Pipe Class-- (4"-CL 51)(6" or larger-CL 50) Lining-- Cement (AWWA C-104)

Laying Length-- 18 feet

Joint Type-- Mechanical Joint (all pipe joints)

Fitting Class-- Ductile Iron
Fitting Type-- Mechanical Joint

Minimum Cover-- 30 inches
Maximum Cover-- 40 inches

Outside Coating-- Asphaltic (AWWA C-151)

#### **Steel Casing Pipe**

Material-- Steel Pipe, A.S.T.M. 153-B Nominal Casing Diameter-- As shown on the Contract Plans

Minimum Yield Strength-- 35,000 psi

Steel casing shall be new material

#### Water Fittings

Water main fittings; i.e., ells, tees, reducers, etc.; shall be mechanical joint type and either ductile iron conforming to the requirements of AWWA C-110 or cast iron materials. Compact ductile iron fittings shall conform to AWWA C-153 (350 pressure class). Valves, fittings and other appurtenances shall be the type and size shown on the project plans; shall include the appropriate type and sized gaskets, transition gaskets, seals, bolts and other incidental hardware. The cost of said miscellaneous hardware is to be considered incidental to the unit bid price of the related Pay Items. All fittings shall have the same outside coating and interior lining as the Ductile iron pipe.

# Valves, Hydrants and Appurtenances

Valve assemblies shall be set plumb with valve boxes remaining directly over the valve. All new valve boxes or existing boxes which are reset shall be placed with the top of the valve box at finished grade. Valve boxes shall be backfilled and the earth thoroughly compacted.

In the event of valve settings in excess of three (3) feet, a permanent valve stem extension shall be furnished in the valve box. The cost of furnishing and installing the valve stem extension shall be included in the unit bid price per each valve and box setting.

Hydrants shall be set plumb with the nozzles being not less than twelve (12) inches above the finished grade. Hydrants shall be turned in order that the pumper nozzle is directed toward the street, unless otherwise approved by the Engineer. Hydrants shall be provided with a

Plugs shall be of ASTM A126 Class B cast iron in compliance with AWWA C504, Section 2.2. The plug shall be of one piece construction and shall be capable of withstanding the full pressure rating of the valve without use of additional structural reinforcing ribs that extend beyond the profile of the plug itself. Plugs shall be resilient faced with neoprene or hycar, suitable for use with sewage. Plugs with cast inlays shall not be acceptable.

Valves shall be furnished with replaceable, sleeve type metal bearings conforming to AWWA C504, Section 3.6 and AWWA C507, Section 8. Bearings shall be of sintered, oil impregnated and permanently lubricated type 316 ASTM A743 Grade CF-8M or AISI Type 317L stainless steel in 1/2" - 36" sizes. In valves larger than 36", the upper and lower plug journals shall be fitted with ASTM A-240 type 316 stainless sleeves with bearings of ASTM B30, Alloy C95400 aluminum bronze. Non-metallic bearings shall not be acceptable.

Valves shaft seals shall be of the multiple V-ring type and shall be externally adjustable, repackable without removing the bonnet or actuator from the valve, and repackable under pressure. Shaft seals shall conform with AWWA C504, Section 3.7 and AWWA C507, Section 10.2. Valves utilizing O-ring seals or non-adjustable packing shall not be acceptable. All exposed nuts, bolts, springs, washers, etc., shall be stainless steel for buried valves and zinc plated for all others.

Valve pressure rating shall be 175 psi through 12" and 150 psi for 14" through 72". Each valve shall be given a hydrostatic and seat test with test results being certified.

Certified copies of proof-of-design test reports shall be furnished as outlines in AWWA C504, Section 5.5.

Manual valves shall have lever or gear actuators and tee wrenches, extension stems, floor stands, etc., as indicated on the plans. All valves 8" and larger shall be equipped with gear actuators. All gearing shall be enclosed in a semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator. The actuator shaft and the quadrant shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. All exposed nuts, bolts and washers shall be zinc plated.

Valves and gear actuators for buried or submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent the entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs and washers shall be stainless steel. All gear actuators shall conform to AWWA C504, Section 3.8.

All valves and actuators shall be as manufactured by DeZurik or approved equal.

will not be allowed for such work; the cost of such work shall be considered incidental to the several Pay Items for the proposed water system.

Water meter service lines shall be installed by boring technique or by pushing service line under existing paved areas.

Compensation for driveway, road or street crossings will be included in the Unit Bid Price per linear foot of service line installation. The Contractor shall use due care and consideration when installing service lines by pushing under existing pavement, particularly in the presence of other existing buried utilities.

#### **Standard Manufactured Items**

Listed below are manufacturer's items which have been deemed acceptable for this project. This listing is in no manner exclusive and other suppliers' items which are equal will be acceptable. Suppliers of other manufacturer's items must submit specifications, technical data and materials testing reports for review and approval by the Owner and by the Engineer prior to materials acceptance under the "or equal" clause.

Polyvinyl Chloride Pipe:

Certaineed, Capco, Can-Tex, H & W, Vulcan, or equal.

Ductile Iron Pipe:

U.S. Pipe, Griffin, Tyler, or equal.

Gate Valves:

Kennedy, Mueller, or equal.

Fire Hydrants:

Mueller, Kennedy, or equal.

Tapping Sleeve:

Power Seal, JCM Industries, Inc. Smith-Blair, Inc., or equal.

#### **Defective or Damaged Materials**

The Contractor shall be responsible for all material furnished by or to him, and shall replace at no expense to the Owner all such material found to be damaged or defective in manufacture or as a result of improper handling. Replacement of defective or damaged materials shall include furnishing all material and labor required for a satisfactory and acceptable installation as approved by the Engineer.

The Contractor shall be responsible for the safe storage of materials furnished by or to him, and accepted by him for use on the project, until such time as the materials are incorporated into the completed project. The exterior as well as the sealing surfaces of all pipe, fittings, structures, seals and other accessories shall be kept free of dirt and foreign matter at all times. Care shall be taken at all times to avoid damage to pipe materials, fittings and appurtenances. Valves and hydrants shall be drained and stored in a manner that will protect

the site of all debris; test the completed pipe line for pressure and leakage requirements; disinfect the completed pipeline; restore the pavements and other improved surfaces of the trench; and restore all disturbed ground surfaces to a condition, equal to or better than the original surface, as directed by the Engineer.

Temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers and other structures encountered in the progress of the work shall be furnished by the Contractor at his own expense. Where grade, alignment or minimum cover of the pipe is obstructed by existing utility structures such as conduits, ducts, pipes, branch connections to main sewers, or main drains, the line shall be adjusted by raising or lowering the main; (1) where grades are not critical or the obstruction shall be permanently supported, relocated, removed, or (2) reconstructed by the Contractor in cooperation with the owners of such utility structures where lines and grades are critical; as approved by the Engineer.

All pipe shall be laid to and maintained at the required lines and grades if shown on the plans. If lines and grades are not shown on the plans, the minimum cover as called for on the plans shall be maintained at all times. Fittings, valves, air vents and hydrants shall be installed at the required locations with valve and hydrant stems plumb. No deviation shall be made from the required line and grade or minimum/maximum cover requirements without approval from the Engineer or his representative.

### 5.6. PIPE PLACEMENT

The trench bottom shall be constructed to provide a firm, stable and uniform support for the full length of the pipe. The trench shall be dug to the required alignment and depth and only so far in advance of pipe laying as is safe and practical. No trench shall be left open and unguarded while construction operations are not in progress.

All pipe, fittings, valves, hydrants, and accessories shall be carefully lowered into the trench using suitable equipment in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall the pipe or accessories be dropped or dumped into the trench.

All foreign matter or dirt shall be removed from the interior of the pipe before lowering into position in the trench. Pipe shall be kept clean by means approved by the Engineer during and after laying.

The pipe shall be cut in a neat and workmanlike manner without damage to the pipe so as to have a smooth end at right angles to the axis of the pipe. Pipe ends shall be cut square, deburred and beveled in accordance with the pipe manufacturer's recommendations.

The pipe and accessories shall be inspected for defects prior to lowering into the trench. Any defective, damaged or unsound material shall be repaired or replaced as directed by the Engineer.

The Contractor shall backfill with natural soil to a point six (6) inches above top of pipe. That portion of the trench to a point six (6) inches below the grade line, shall be backfilled with material free from rock and acceptable to the Engineer. The material shall be placed and compacted in layers of approximately six (6) inches. Upon approval by the Engineer, the Contractor may backfill this portion of the trench with crushed stone in lieu of materials which require compaction.

The upper portion of the trench shall be temporarily backfilled and maintained with crushed stone or gravel until such time as the sidewalk is constructed or the driveway surface is restored.

### Method "C" -- Backfilling under Streets, Roads & Paved Driveways

Backfilling of pipeline trenches under streets, roads and paved driveways shall be accomplished in the following manner:

The Contractor shall backfill with natural soil to a point six (6) inches above top of pipe. That portion of the trench to a point six (6) inches below the bottom of the pavement or concrete sub-slab, shall be backfilled with crushed stone.

The upper portion of the trench, from a point six (6) inches below the pavement or concrete sub-slab up to grade, shall be backfilled with a base course of dense-graded aggregate or crushed stone suitable to the Engineer. At such time that pavement replacement is accomplished, the excess base course shall be removed as required.

### **Settlement of Trenches**

The Contractor shall be responsible for any trench settlement which occurs within one year from the time of final acceptance of the work. The trench settlement shall be repaired at no additional cost to the Owner.

### Backfilling at Unimproved Driveways, Rural Roads and Unimproved Streets

The Contractor shall backfill with natural soil to a point twelve (12) inches above the top of the pipe. The remainder of the trench shall be backfilled with dense-graded aggregate (DGA) or crushed limestone suitable to the Engineer.

### 5.8. REACTION OR THRUST BLOCKING

A reaction or thrust blocking shall be provided at each hydrant, bend, tee and at reducers or fittings where changes in pipe diameters or directions occur. Anchorage may also be made to the water main pipe with rods and clamps.

### 5.9. SERVICE CONNECTIONS

Service connections for all pipe diameters and classes may be made by means of a suitable saddle, tapped coupling, or service connector for plastic pipe. The saddle, tapped coupling

the proper number of bacteriological samples taken at the points specified in the following paragraph of this section are examined and are shown to be negative following disinfection. Chlorination residual tests (50 and 25 ppm) shall be taken at each bacteriological test point.

Bacteriological samples shall be submitted for each new construction project, routine repair, replacement, or extension to existing systems after disinfection and flushing. Two samples shall be taken from the first one-half (1/2) mile of water line. On shorter lines a sample shall be taken from a tap point placed as near as possible to the origin and to the terminus points of the main (i.e., minimum of two (2) separate testing points per short run water main). Additionally, one (1) sample per mile for each mile of new distribution line shall be submitted. If bacteriological tests are positive, the sterilization and bacteriological tests shall be performed until bacteriological tests are negative. A complete chain of custody procedure shall be provided for each set of chlorine residual/bacteriological test samples.

All water sampling and testing shall be performed by independent laboratories/personnel which are deemed satisfactory and approved by the Engineer. Sampling, testing, analysis, etc., shall be provided at the expense of the Contractor and shall be considered incidental to the several Pay Items for the proposed water system.

### 5.12. CONNECTIONS TO EXISTING LINES

Connection of a new main to an existing main shall be performed in a safe, neat sanitary workmanlike manner. Connection to existing water mains shall be made under full pressure unless otherwise approved by the Engineer. A tapping valve and sleeve shall be utilized to provide the connection and shall be mechanical joint tapping sleeves.

Tapping sleeves shall be the proper size and shall be installed in accordance with the manufacturer's recommendations. Tapping sleeves shall be pressure tested to the pressure specified for the water main in the materials section of these specifications. Pressure testing shall be performed prior to the actual tapping of the existing water main.

In the event water service has to be interrupted, it must be under the approval and direct supervision of the utility owner. It will be the Contractor's responsibility to inform all affected customers 24 hours in advance of the interruption. The Contractor shall be responsible for opening and closing all valves that will affect customer service.

Great care shall be taken to prevent pipe line contamination when dewatering, cutting into or making connections with existing pipelines used for the conveyance or distribution of water for domestic or public use. The Contractor shall work with the Engineer in isolating services and shall conduct his operation in such a manner that no trench water, mud or other contaminating substances are permitted to get into the connected line or lines at any time during the progress of the work. The interiors of all pipe, fittings and valves, both new and reused, installed in such connections, shall be thoroughly cleaned and disinfected in accordance with A.W.W.A. Standard C-601, "Disinfection of Water Main" and requirements of the Kentucky Division of Water Quality.

### 5.15. QUALITY CONTROL

Each truckload of pipe delivered to the project shall be subject to field measurements and tests deemed necessary by the Engineer. These tests may be conducted by the Engineer or his representative. The costs of such testing shall be the responsibility of the Owner, however, the cost of any pipe destroyed during such testing shall be the responsibility of the Contractor.

### 5.16. DITCH CROSSING PROTECTION

At ditch crossing locations shown on the construction plans bag mix shall be placed on top of the water line for ballast and line protection. The water line trench shall be excavated to a depth which will provide a minimum of 30 inches cover between top of the pipe and the ditch bottom.

Bags of pre-mixed cement concrete shall be placed over the pipe to form a continuous protective cover prior to backfilling the trench. The bags shall be placed flat over the pipe with the length dimension of the bag being perpendicular to the centerline of the water line. The paper bags shall be cut or perforated in order for the concrete mix to bond between bags. The protective concrete bags shall extend a minimum of four (4) feet beyond the limits of the natural or proposed ditch bottom. Compensation for the ditch crossing protection shall be included in the bid price.

### 5.17. JACK AND BORE

Roadway crossings and other sections of the proposed project requiring steel encasement pipe shall be installed at locations, to the line and grade, shown on the Project Plans. Unless otherwise noted in the Project Plans or Specifications the steel casing shall be installed by Jack and Bore Technique. Compensation for the Jack and Bore installed steel casing shall be paid per bid unit price for the respective size of installed steel casing sections as verified by and as approved by the Engineer.

Steel pipe shall conform to requirements of A.S.T.M. A53-B and shall not be less than the minimum diameter and wall thickness shown on the Project Plans. The steel pipe shall have a minimum yield strength of not less than 35,000 psi. Steel casing shall be new materials.

The void between the carrier pipe and the steel casing pipe at each end of the casing shall be thoroughly sealed with mastic.

When a casing is extended under a road ditch, the top of the casing shall be a minimum of thirty (30) inches below the ditch flow line.

the Engineer. At the time of final inspection the Contractor shall be required to flush all hydrants and blow-offs. All valves and hydrants shall be inspected for plumbness and correct construction.

Final inspection shall be completed prior to final release of the project retainage funds. Unsatisfactory construction items discovered during the final inspection process shall be repaired by the Contractor to the satisfaction of the Engineer.

Any valves, hydrants, blow-offs, air release valves or other construction items which are not found to be completed, turned on, or ready for use at the time of subsequent fire flow or system testing by the local fire department and/or water system operator, will be reported to the Contractor for repair. A service call fee of not less than \$100.00 will be paid by the Contractor to the fire department and/or water system operator that dispatched personnel and equipment necessary for testing the completed line in the event the item (i.e. line, hydrant, valve, etc.) is not available for service, is not turned on or is otherwise inoperable.

### **5.23. PROXIMITY TO EXISTING SEWER MAINS**

Water mains crossing sewer shall be laid to provide a vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to prevent damage to the water main.

Water mains shall be laid at least 10 feet horizontally from any existing or proposed sewer main. The distance shall be measured edge to edge.

### 5.24. METER SETTER CHANGE-OUT (PRV/DOUBLE CHECK)

### Meter Box and Cover

A meter box with cover shall be provided for each service and shall be as near the property line as possible and shall be located as directed by the Engineer. The meter box shall be high density polyethylene (0.300 inch wall thickness) construction as manufactured by Carson Industries or approved equal. The size shall be 24" deep unless otherwise specified or required by the meter size (DX 1015-24 HDPE or approved equal).

The meter box cover shall be a non-hinged HDPE cover (DX 1015-8 or approved equal) with a cast iron meter reading lid (DX 1015-24 CIR or approved equal).

Meter boxes and covers shall be set with backfill neatly compacted in place. In yards and other maintained areas, the top of the meter box cover shall be 1/2 inch to 1 inch above original grade, otherwise 2 inches above original grade.

### **SECTION 6**

### D. G. A. BASE MATERIALS

<u>Section</u>	<u>Item</u>	Page
6.1	Scope of Work	TS-42
6.2	Placement	TS-42
6.3	Subgrade Stabilization	TS-42
6.4	Clearing and Excavation	TS-42
6.5	Subgrade Approval	TS-43
6.6	Dust and Nuisance Control	TS-43
6.7	Base Material Watering and Conditioning	TS-43

### 6.5. SUBGRADE APPROVAL

Base materials shall be placed on stable, compacted subgrade and shall not be placed on mud, frozen ground, unstable areas, areas subject to pumping or other uncompacted areas. No payment will be allowed for D.G.A. materials placed prior to approval of the subgrade by the Engineer. The subgrade shall be drained at all times.

### 6.6. DUST AND NUISANCE CONTROL

Adjacent street, roadways, alleys, driveways, and sidewalks shall be kept reasonably clean of mud, dust, dirt and associated construction debris. The Contractor shall provide a power broom, watering truck or other devices deemed necessary to clean adjacent streets in order to minimize nuisance and/or cause inconvenience along the public thoroughfare in the vicinity of the site.

### 6.7. BASE MATERIAL WATERING AND CONDITIONING

Watering, grading or compacting of the subgrade shall be provided by the Contractor in order to keep the D.G.A. base materials tight and compacted prior to placement of the base asphalt materials.

### 7.1. SCOPE OF WORK

Work under this section shall include all labor, equipment, materials hand tools, and incidentals necessary to furnish and place the fencing (including required temporary fencing). The fence shall be constructed along a true line as shown on the Contract Plans. All materials shall conform to the Standard Specifications for road and bridge construction issued by the Kentucky Department of Highways.

### 7.2. FENCING MATERIALS

Fencing materials shall meet the following minimum size and physical characteristic requirements:

Barbed Wire - 12 1/2 gage steel

4 point pattern 5" spacing

Timber/Corner Pull Posts Treated timber

and Brace Posts - 8"x8" nominal size

8' overall minimal length 3' minimum bury depth maximum spacing: 250'

Line Posts - Studded steel "T" posts

Weight: 1.33 #/L.F.

7' overall minimum length 2.5' minimum driven depth Maximum spacing: 10'

Timber Braces - Treated timber

Nominal size: 4"x4"
Diagonal placement with
Maximum 10' horizontal span

Length

Chain Link Fence Fabric - Zinc coated steel 0.148"

nominal diameter (No. 9 Gage)

2" mesh spacing

Top and bottom salvages shall be

twisted and barbed.

### 7.3. CONSTRUCTION

Fence shall be constructed with new materials at locations shown on the Contract Plans. Sufficient tension shall be applied to each of the fence fabric and the barbed wire strands between pull posts in order to provide a stock tight fence.

Posts shall be set or driven to the minimum depth established for the respective type post. Posts shall be erected plumb and shall be in true alignment. Posts shall be set firm and rigid in its position by tamping, concreting or driving as is applicable.

Posts which are split, bent or otherwise damaged shall be removed and replaced by the Contractor at no additional compensation.

### Wire Fence

Diagonal braces shall be placed at each corner post system and at each pull post system. Ends of the diagonal brace shall be chamfered to fit vertical posts at each end and shall be secured to posts by spike nailing.

Barbed wire strands and/or woven wire fence fabric shall be secured to steel posts by use of standard manufactured ties or wire loops. Fence fabric and/or barbed wire strands shall be secured to wooden posts by steel staple nails. Barbed wire strands shall be installed at uniform spacing and shall be parallel to the general ground level for barbed wire fences.

### **Temporary Fence**

Temporary fencing shall be erected along pasture areas where livestock will remain during construction process and shall be placed along the temporary construction easement limits. Any temporary fencing required during the construction project shall be coordinated with the respective property owner/farm operator by the Contractor. The cost of furnishing, installing, maintaining and removing any temporary fence sections necessary during the project shall be merged into the bid unit price for permanent fence construction.

### **Temporary Safety Fence**

Temporary safety fence shall be constructed at locations shown on the Contract Plans and per manufacturer's recommendations. Sufficient tension shall be applied to the fence fabric between pull posts in order to provide a tight fence.

Temporary safety fencing shall be placed along the temporary construction easement limits or as indicated on the Contract Plans. The cost of furnishing, installing, maintaining and removing any temporary safety fence sections necessary during the project shall be a separate bid item.

### **SECTION 8**

### SEEDING AND PROTECTION

Section	<u>Item</u>	<u>Page</u>
8.1	Scope of Work	TS-50
8.2	Materials	TS-50
8-3	Construction Requirements	TS-50

The Contractor is required to exercise extreme care when backfilling and shaping the disturbed areas to insure that flooding and water ponding will not occur. Areas of excessive settlement, ponding, etc., shall be reshaped, filled or regraded as many times as necessary to provide a uniformly contoured restoration area, at no additional cost to the Owner.

The Contractor shall grade, disc, shape, seed, fertilize, mulch and water the ground cover restoration areas as many times as necessary in order to provide a uniform ground cover of specified grasses and clovers in all restoration areas. The Contractor shall provide a guaranteed ground cover at all restoration areas for a period of one year after project completion.

### 9.1. MATERIALS SPECIFICATIONS

All construction materials shall conform to the requirements as specified by the Kentucky Department of Highways or as otherwise defined in the Project Specifications and Contract Documents.

The cost of any materials testing or sampling shall be the responsibility of the Owner. Any stockpiled or placed materials which the Engineer deems inferior or inadequate shall be removed and replaced at the Contractor's expense.

All construction materials shall be the type and size shown on the Construction Plans.

The Contractor shall furnish upon request the manufacturer's/vendor's certification of materials standards for review and approval relative to the requirements of the Contract Documents.

### 9.2. FLOWABLE FILL AS PIPE BACKFILL (NIC)

Unless otherwise specified on the project plans, flowable fill shall be used at roadway crossings as backfill material. Compensation for furnishing and placing the flowable fill shall be paid per cubic yard as verified by and as approved by the Engineer.

### Description

Flowable fill is a low strength mixture consisting of portland cement, sand, class F fly ash, water and other materials as approved by the Engineer. Flowable fill has a density between 115 lb./c.f. and 130 lb./c.f. and is of a consistency that will flow under and around pipe. Flowable fill does not require compaction, finishing, or curing and will not settle after hardening occurs. It is ideal for use in restricted areas where placing and compacting fill material is difficult and where traffic cannot be delayed for a long period. When used to backfill aluminum pipe, an approved means of separation shall be provided, such as bituminous coating.

### **Materials**

Unless otherwise approved by the Engineer flowable fill shall be proportioned as follows, per cubic yard:

Cement	30 lbs.
Fly Ash, Class F	300 lbs.
Sand (S.S.D.)	3000 lbs.
Water (Maximum)	550 lbs.

To expedite settlement and hardening of the flowable fill, bleed water should appear on the surface within 5 to 10 minutes after placement. The release of water by bleeding

Anchors may be made of small lumber or metal straps, and shall be adequately spaced. For larger diameter pipe, it may be possible to maintain a surge of flowable fill on top of the pipe to prevent floating. Floating will usually not occur after the level of the backfill is above the springline of the pipe. The Contractor shall be responsible to insure that the pipe remains in the correct horizontal position and at the specified elevation.

### 9.3. PORTLAND CEMENT ROADBED MODIFICATION (NIC)

The roadbed modification process is achieved by uniformly mixing portland cement with roadbed materials and compacting to the lines, grades, thickness, and cross sections as specified in the contract plans. Modification shall also comply with Kentucky's Standard Specifications for Road and Bridge Construction, Section 304. Mixing depth and cement ratio shall be as defined in the Contract Documents or as directed by the Engineer.

### **10.1. GENERAL**

### References

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

### AMERICAN CONCRETE INSTITUTE (ACI)

ACI 211.1	(1981; Rev 1985) Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 211.2	(1981) Selecting Proportions for Structural
	Lightweight Concrete
ACI 301	(1984; Rev 1988) Structural Concrete for Buildings
ACI 305R	(1977; Rev 1982) Hot Weather Concreting
ACI 318	(1983; Rev 1986) Building Code Requirements for Reinforced Concrete
AMERICAN SOCIETY FOR	R TESTING AND MATERIALS (ASTM)
ASTM C 31	(1988) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1986) Concrete Aggregates
ASTM C 39	(1986) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42	(1987) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 78	(1984) Flexural Strength of Concrete (Using Simple Beam With Third Point Loading)
ASTM C 94	(1986b) Ready Mixed Concrete
ASTM C 109	(1987) Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)
ASTM C 143	(1978) Slump of Portland Cement Concrete

ASTM C 989 (1988) Ground Iron Blast Furnace Slag for Use in

Concrete and Mortars

ASTM C 1017 (1985) Chemical Admixture for Use in Producing

Flowing Concrete

ASTM D 98 (1987) Calcium Chloride

ASTM E 96 (1980) Water Vapor Transmission of Materials

FEDERAL SPECIFICATIONS (FS)

FS HH I-530 (Rev B; Int Am 1) Insulation Board,

Thermal, Unfaced, Polyurethane or

Polyisocyanurate

FS CCC-C-467 (Rev C) Cloth, Burlap,

Jute (or Kenaf)

NATIONAL READY-MIXED CONCRETE ASSOCIATION (NRMCA)

NRMCA 01 (Jan 1, 1984) Certification of

Ready Mixed Concrete Production

Facilities

NRMCA CPMB 100 (8th Rev 1986) Concrete Plant

Standards

NRMCA TMMB-01 (Jan 1, 1982; llth Rev) Truck Mixer and

Agitator Standards

CORPS OF ENGINEERS (COE)

COE CRD-C 621- (1989) Specification for Non-Shrink Grout

### **Submittals**

Submit shop drawings and product data as directed by the Engineer and as outlined in the Contract Documents.

### **Proportions of Mix**

### A. Mixture Proportioning, Normal Weight Concrete

Trial batches shall contain materials proposed to be used in the project. Trial mixtures having proportions, consistencies and air content suitable for the work shall be made based on methodology described in ACI 211.1, using at least three different water-cement ratios. Trial mixes shall be proportioned to produce concrete strengths specified. In the case where ground iron blast-furnace slag is used, the weight of the slag will be substituted in the equations for the term P which is used to denote the weight of pozzolan. Trial mixtures shall be designed for maximum permitted slump and air content. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192. They shall be tested at 7 and 28 days in accordance with ASTM C 39. From these test results a curve shall be plotted showing the relationship between water-cement ratio and strength.

### B. Average Strength

In meeting the strength requirements specified, the selected mixture proportion shall produce an average compressive strength exceeding the specified strength by the amount indicated below. Where a concrete production facility has test records, a standard deviation shall be established. Test records from which a standard deviation is calculated shall represent materials, quality control procedures, and conditions similar to those expected; shall represent concrete produced to meet a specified strength or strengths within 1000 psi of that specified for proposed work; and shall consist of at least 30 consecutive tests. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days or at other test age designated for determination of the specified strength.

### 1. Test Records Exceeding 29

Required average compressive strength used as the basis for selection of concrete proportions shall be the larger of the specified strength plus the standard deviation multiplied by 1.34 or the specified strength plus the standard deviation multiplied by 2.33 minus 500.

### 2. Test Records Less Than 29

Where a concrete production facility does not have test records meeting the above requirements but does have a record based on 15 to 29

### 10.2. PRODUCTS

### **Admixtures**

Admixtures shall conform to the following:

A. Accelerating Admixture

ASTM C 494, Type C or E; or calcium chloride conforming to ASTM D 98.

- B. Air Entraining Admixture ASTM C 260.
- C. Flowing Concrete Admixture ASTM C 1017, Type 1 or 2.
- D. Water-Reducing or Retarding Admixture ASTM C 494, Type A, B, D, F, or G.

### **Cementitious Materials**

Cementitious materials shall each be of one type and from one source when used in concrete which will have surfaces exposed in the finished structure. Cementitious materials shall conform to one of the following:

- A. Cement ASTM C 150, Type I or II low alkali.
- B. Portland Blast-Furnace-Slag Cement ASTM C 595, Type IS.
- C. Portland-Pozzolan Cement ASTM C 595, Type IP.
- D. Pozzolan ASTM C 618, Class F.
- E. Ground Iron Blast-Furnace Slag ASTM C 989 Grade 120.

### Aggregates

Aggregates shall conform to the following:

- A. Lightweight Aggregate ASTM C 330
- B. Normal Weight Aggregate ASTM C 33.

### 10.3. EXECUTION

### **Preparation of Surfaces**

Surfaces to receive concrete shall be clean and free from frost, ice, mud, and water. Conduit and other similar items shall be in place and clean of any deleterious substance.

### A. Foundations

Earthwork shall be as specified on Drawings. Flowing water shall be diverted without washing over freshly deposited concrete. Rock foundations shall be cleaned by high velocity air-water jets, sandblasting, or other approved methods. Debris and loose, semi-detached or unsound fragments shall be removed. Rock surfaces shall be moist but without free water when concrete is placed. Semiporous subgrades for foundations and footings shall be damp when concrete is placed. Pervious subgrades shall be sealed by blending impervious material with the top 6 inches of the in-place pervious material or by covering with an impervious membrane.

### B. Perimeter Insulation

Perimeter insulation shall be installed at locations indicated. Adhesive shall be used where insulation is applied to the interior surface of foundation walls.

### C. Vapor Barrier

Unless otherwise indicated, subgrades for slabs in buildings shall be covered with a vapor barrier. Vapor barrier edges shall be lapped at least 4 inches and ends shall be lapped not less than 6 inches. Patches and lapped joints shall be sealed with pressure-sensitive adhesive or tape not less than 2 inches wide and compatible with the membrane.

### D. Preparation of Previously Placed Concrete

Concrete surfaces to which other concrete is to be bonded shall be roughened in an approved manner that will expose sound aggregate uniformly without damaging the concrete. Laitance and loose particles shall be removed. Surfaces shall be moist but without free water when concrete is placed.

### Installation of Embedded Items

Embedded items shall be free from oil, loose scale or rust, and paint. Embedded items shall be installed at the locations indicated and required to serve the intended purpose. Voids in sleeves, slots and inserts shall be filled with readily removable material to prevent the entry of concrete.

### A. Aggregates

Aggregates for normal weight concrete shall be sampled and tested in accordance with ASTM C 33. Gradation tests shall be performed on the first day and every other day thereafter during concrete construction.

### B. Sampling of Concrete

Samples of concrete for air, slump, unit weight, and strength tests shall be taken in accordance with ASTM C 172.

### 1. Air Content

Test for air content shall be performed in accordance with ASTM C 173 or ASTM C 231. A minimum of 1 test per day shall be conducted.

### 2. Slump

At least 2 slump tests shall be made on randomly selected batches of each mixture of concrete during each day's concrete placement. Tests shall be performed in accordance with ASTM C 143.

### C. Evaluation and Acceptance of Concrete

### 1. Frequency of Testing

Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, nor less than once for each 150 cubic yards of concrete, nor less than once for each 5000 square feet of surface area for slabs or walls. If this sampling frequency results in less than 5 strength tests for a given class of concrete, tests shall be made from at least 5 randomly selected trucks or from each truck if fewer than 5 truck loads are used. Field cured specimens for determining form removal time or when a structure may be put in service shall be made in numbers directed to check the adequacy of curing and protection of concrete in the structure. The specimens shall be removed from the molds at the age of 24 hours and shall be cured and protected, insofar as practicable, in the same manner as that given to the portion of the structure the samples represent.

### 2. Testing Procedures

Cylinders and beams for acceptance tests shall be molded and cured in accordance with ASTM C 31. Cylinders shall be tested in accordance with ASTM C 39 and beams shall be tested in accordance with ASTM C 78. A

investigations, testing, load tests, and correction of deficiencies shall be performed, and approved by the Owner, at the expense of the Contractor.

### **Conveying Concrete**

Concrete shall be conveyed from mixer to forms as rapidly as possible and within the time interval specified in paragraph "CONCRETE PLACEMENT" by methods which will prevent segregation or loss of ingredients.

### A. Chutes

When concrete can be placed directly from a truck mixer or other transporting equipment, chutes attached to this equipment may be used. Separate chutes will not be permitted except when specifically approved.

### B. Buckets

Bucket design shall be such that concrete of the required slump can be readily discharged. Bucket gates shall be essentially grout tight when closed. The bucket shall provide means for positive regulations of the amount and rate of deposit of concrete in each dumping position.

### C. Belt Conveyors

Belt conveyors may be used when approved. Belt conveyors shall be designed for conveying concrete and shall be operated to assure a uniform flow of concrete to the final place of deposit without segregation or loss of mortar. Conveyors shall be provided with positive means for preventing segregation of the concrete at transfer points and point of placement.

### D. Pumps

Concrete may be conveyed by positive displacement pumps when approved. Pump shall be the piston or squeeze pressure type. Pipeline shall be steel pipe or heavy duty flexible hose. Inside diameter of the pipe shall be at least three times the maximum size of the coarse aggregate. Distance to be pumped shall not exceed the limits recommended by the pump manufacturer. Concrete shall be supplied to the pump continuously. When pumping is completed, the concrete remaining in the pipeline shall be ejected without contaminating the concrete in place. After each use, the equipment shall be thoroughly cleaned. Flushing water shall be wasted outside the forms.

### **Concrete Placement**

Mixed concrete which is transported in truck mixers or agitators or concrete which is truck mixed, shall be discharged within 11/2 hours or before the drum has revolved 300

### C. Cold Weather Requirements

Special protection measures, approved by the Engineer, shall be used if freezing temperatures are anticipated before the expiration of the specified curing period. The ambient temperature of the air where concrete is to be placed and the temperature of surfaces to receive concrete shall be not less than 40 degrees F. The temperature of the concrete when placed shall be not less than 50 degrees F nor more than 75 degrees F. Heating of the mixing water or aggregates will be required to regulate the concrete placing temperature. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals or other materials shall not be incorporated in the concrete to prevent freezing. Upon written approval, calcium chloride or chemical admixture conforming to ASTM C 494 Type C or E may be used. The amount of calcium chloride shall not exceed 2 percent by weight of the cement, and it shall be batched in solution form. Calcium chloride shall not be used where concrete will be in contact with aluminum or zinc-coated items, or where sulfate resistant or prestressed concrete is specified.

### D. Warm weather Requirements

The temperature of the concrete placed during warm weather shall not exceed 85 degrees F except where an approved retarder is used. The mixing water and/or aggregates shall be cooled, if necessary, to maintain a satisfactory placing temperature. In no case shall the placing temperature exceed 95 degrees F.

### **Construction Joints**

Construction joints shall be located as indicated or approved. Where concrete work is interrupted by weather, end of work shift or other similar type of delay, location and type of construction joint shall be subject to approval of the Owner. Unless otherwise indicated and except for slabs on grade, reinforcing steel shall extend through construction joints. Construction joints in slabs on grade shall be keyed or doweled as shown. Concrete columns, walls, or piers shall be in place at least 2 hours, or until the concrete is no longer plastic, before placing concrete for beams, girders, or slabs thereon. In walls having door window openings, lifts shall terminate at the top and bottom of the opening. Other lifts shall terminate at such levels as to conform to structural requirements or architectural details. Where horizontal construction joints are required, a strip of 1-inch square-edge lumber, beveled and oiled to facilitate removal, shall be tacked to the inside of the forms at the construction joint. Concrete shall be placed to a point 1 inch above the underside of the strip. The strip shall be removed 1 hour after the concrete has been placed, and any irregularities in the joint line shall be leveled off with a wood float, and all laitance shall be removed. Prior to placing additional concrete, horizontal construction joints shall be prepared as specified in paragraph "PREPARATIONS OF SURFACES."

above but without any mixing water. The finish of any area shall be completed in the same day, and the limits of a finished area shall be made at natural breaks in the surface. The surface shall be continuously moist cured for 48 hours. The temperature of the air adjacent to the surface shall be not less than 50 degrees F for 24 hours prior to, and 48 hours after, the application. In hot, dry weather the smooth finish shall be applied in shaded areas.

### 3. Class B Finish

Where a Class B finish is indicated, fins shall be removed. Concrete surface shall be smooth with a texture at least equal to that obtained through the use of Grade B-B plywood forms.

### 4. Class C Finish

Where a Class C finish is indicated, fins shall be removed. Concrete surfaces shall be relatively smooth with a texture imparted by the forms used.

### 5. Class D Finish

Where a Class D finish is indicated, fins exceeding 1/4 inch in height shall be chipped or rubbed off. Concrete surfaces shall be left with the texture imparted by the forms used.

### B. Unformed Surfaces

In cold weather, the air temperature in areas where concrete is being finished shall not be less than 50 degrees F. In hot windy weather when the rate of evaporation of surface moisture, as determined by methodology presented in ACI 305R, may reasonably be expected to exceed 0.2 pounds per square foot per hour; coverings, windbreaks, or fog sprays shall be provided as necessary to prevent premature setting and drying of the surface. The dusting of surfaces with dry materials or the addition of water during finishing will not be permitted. Finished surfaces shall be plane, with no deviation greater than 1/4 inch when tested with a 10-foot straightedge. Surfaces shall be pitched to drains.

### 1. Trowel Finish

Slabs shall be given a trowel finish immediately following floating. Surfaces shall be trowelled to produce smooth, dense slabs free from blemishes including trowel marks. In lieu of hand finishing, an approved power finishing machine may be used in accordance with the directions of the machine manufacturer. A final hard steel troweling shall be done by hand.

minimum thickness of continuously saturated sand, or by covering with waterproof paper, polyethylene sheet, polyethylene-coated burlap or saturated burlap.

### C. Membrane Curing

Membrane curing shall not be used on surfaces that are to receive any subsequent treatment depending on adhesion or bonding to the concrete; except a styrene acrylate or chlorinated rubber compound meeting ASTM C 309, Class B requirements may be used for surfaces which are to be painted or are to receive bituminous roofing or waterproofing, or floors that are to receive adhesive applications of resilient flooring. The curing compound selected shall be compatible with any subsequent paint, roofing, waterproofing or flooring specified. Membrane curing compound shall not be used on surfaces that are maintained at curing temperatures with free steam. Curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. Surfaces shall be thoroughly moistened with water and the curing compound shall be applied to slab surfaces as soon as the bleeding water has disappeared, with the tops of joints being temporarily sealed to prevent entry of the compound and to prevent moisture loss during the curing period. Compound shall be applied in a one-coat continuous operation by mechanical spraying equipment, at a uniform coverage in accordance with the manufacturer's printed instructions. Concrete surfaces which have been subjected to rainfall within 3 hours after curing compound has been applied shall be resprayed by the method and at the coverage specified. On surfaces permanently exposed to view, the surface shall be shaded from direct rays of the sun for the duration of the curing period. Surfaces coated with curing compound shall be kept free of foot and vehicular traffic, and from other sources of abrasion and contamination during the curing period.

### **Setting Base Plates and Bearing Plates**

After being properly positioned, column base plates, bearing plates for beams and similar structural members, and machinery and equipment base plates shall be set to the proper line and elevation with damp-pack bedding mortar, except where non-shrink grout is indicated. The thickness of the mortar or grout shall be approximately 1/24 the width of the plate, but not less than 3/4 inch. Concrete and metal surfaces in contact with grout shall be clean and free of oil and grease, and concrete surfaces in contact with grout shall be damp and free of laitance when grout is placed.

### A. Damp-Pack Bedding Mortar

Damp-pack bedding mortar shall consist of 1 part cement and 2-1/2 parts fine aggregate having water content such that a mass of mortar tightly squeezed in the

- ASTM A 185 (1985) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
- ASTM A 497 (1989) Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
- ASTM A 499 (1981; R 1988) Steel Bars and Shaped, Carbon Rolled from "T" Rails
- ASTM A 615 (1989) Deformed and Plain Billet Steel Bars for Concrete Reinforcement
- ASTM A 675 (1988) Steel Bars, Carbon, Hot Wrought, Special Quality, Mechanical Properties
- ASTM A 706 (1989) Low-Alloy Steel Deformed Bars for Concrete Reinforcement

AMERICAN WELDING SOCIETY (AWS)

AWS D1.4 (1979) Structural Welding Code - Reinforcing Steel

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

CRSI DA4 (Jan 1986; 24th Ed) Manual of Standard Practice

### Submittals

Submit shop drawings and product data as directed by the Engineer and as outlined in the Contract Documents.

### **Qualifications**

Welders shall be qualified in accordance with AWS D1.4. Qualification test shall be performed at the worksite and the Contractor shall notify the Owner 24 hours prior to conducting tests. Welding procedures qualified by others and welders qualified by another employer may be accepted as permitted by AWS D1.4.

### **Delivery and Storage**

Reinforcement and accessories shall be stored off the ground on platforms, skids, or other supports.

### A. Placement

Reinforcement shall be free from loose rust and scale, dirt, oil, or other deleterious coating that could reduce bond with the concrete.

Reinforcement shall be placed in accordance with ACI 318 at locations shown plus or minus one bar diameter. Reinforcement shall not be continuous through expansion joints and shall be as indicated through construction or contraction joints. Concrete coverage shall be as indicated or as required by ACI 318. If bars are moved more than one bar diameter to avoid interference with other reinforcement, conduits or embedded items, the resulting arrangement of bars, including additional bars required to meet structural requirements, shall be approved before concrete is placed.

### B. Splicing

Splices of reinforcement shall conform to ACI 318 and shall be made only as required or indicated. Splicing shall be by lapping or by mechanical or welded butt connection; except that lap splices shall not be used for bars larger than No. 11 unless otherwise indicated. Welding shall conform to AWS D1.4. Welded butt splices shall be full penetration butt welds. Lapped bars shall be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than onefifth the required length of lap or 6-inches. Mechanical butt splices shall be in accordance with the recommendation of the manufacturer of the mechanical splicing device. Butt splices shall develop 125 percent of the specified minimum yield tensile strength of the spliced bars or of the smaller bar in transition splices. Bars shall be flame dried before butt splicing. Adequate jigs and clamps or other devices shall be provided to support, align, and hold the longitudinal centerline of the bars to be butt spliced in a straight line.

### Welded-Wire Fabric

Welded-wire fabric shall be placed in slabs as indicated. Fabric placed in slabs on grade shall be continuous between expansion, construction, and contraction joints. Lap splices shall be made in such a way that the overlapped area equals the distance between the outermost crosswires plus 2 inches. Laps shall be staggered to avoid continuous laps in either direction. Fabric shall be wired or clipped together at laps at intervals not to exceed 4 feet. Fabric shall be positioned by the use of supports.

### **Dowels**

Dowels shall be installed in slabs on grade at locations indicated and at right angles to joint being doweled. Dowels shall be accurately aligned parallel to the finished concrete

FS SS-S-1401 (Rec. C) Sealants, Joint, Non-Jet-Fuel-Resistant, Hot-Applied, for Portland Cement and Asphalt Concrete Pavements

FS SS-S-1614 (Rev. A) Sealants, Joint, Jet-Fuel-Resistant, Hot-Applied, for Portland Cement and Tar Concrete Pavements

### **Submittals**

Submit shop drawings and product data as required by the Engineer and as outlined in the Contract Documents.

### **Delivery and Storage**

Material delivered and placed in storage shall be stored off the ground and protected from moisture, dirt, and other contaminants. Sealants shall be delivered in the manufacturer's original unopened containers. Sealants whose shelf life has expired shall be removed from the site.

### 10.8. PRODUCTS

### **Contraction-Joint Strips**

Contraction-joint strips shall be 1/8-inch thick tempered hardboard conforming to ANSI A135.4, Class 1. In lieu of hardboard strips, rigid polyvinylchloride (PVC) insert strips specifically designed to induce controlled cracking in slabs on grade may be used. Such insert strips shall have removable top section.

### **Expansion-Joint Filler**

Expansion-joint filler shall be premolded material conforming to ASTM D 1751 or ASTM D 1752. Unless otherwise indicated, filler material shall be 3/8-inch thick and of a width applicable for the joint formed.

### Joint Sealant

Joint sealant shall conform to the following:

- A. Preformed Polychloroprene Elastomeric Joint Seals ASTM D 2628.
- B. Lubricant for Installation of Preformed Compression Seals ASTM D 2835.
- C. Hot-Poured Type FS SS-S-1401.
- D. Cold-Applied Jet-Fuel Resistant Type FS SS-S-200, Type M.
- E. Hot-Applied Jet-Fuel Resistant Type FS SS-S-1614.

### B. Expansion Joints

Premolded expansion joint filler shall be used in expansion and isolation joints in slabs around columns and between slabs on grade and vertical surfaces where indicated. The filler shall extend the full slab depth, unless otherwise indicated. The edges of the joint shall be neatly finished with an edging tool of 1/8-inch radius, except where a resilient floor surface will be applied. Where the joint is to receive a sealant, the filler strips shall be installed at the proper level below the finished floor with a slightly tapered, dressed-and-oiled wood strip temporarily secured to the top thereof to form a recess 3/4-inch deep to be filled with sealant. The wood strip shall be removed after the concrete has set. In lieu of the wood strip a removable expansion filler cap designed and fabricated for this purpose may be used.

### C. Joint Sealant

Sawed contraction joints and expansion joints in slabs shall be filled with joint sealant, unless otherwise shown. Types and locations of sealants shall be as indicated. Joint surfaces shall be clean, dry, and free of oil or other foreign material which would adversely affect the bond between sealant and concrete. Joint sealant shall be applied as recommended by the manufacturer of the sealant. Joints sealed with field molded sealant shall be completely filled with sealant.

### Waterstops

Waterstops shall be of the type indicated and shall be installed at the locations shown to form a continuous water-tight diaphragm. Adequate provision shall be made to support and completely protect the waterstops during the progress of the work. Any waterstop punctured or damaged shall be repaired or replaced. Splices shall be made in conformance with the recommendations of the waterstop manufacturer. Continuity of cross sectional features shall be maintained across the splice. Splices showing evidence of separation after bending shall be remade.

### 11.1. PERMITS SECURED BY CONTRACTOR

Refer to Section 1.6., "Legal Considerations and Insurance", for information regarding permits to be secured by the Contractor.

### 11.2. PERMITS SECURED BY OWNER

### **Division of Water**

Permits have been obtained by the Owner, for system construction, from the Kentucky Division of Water. All permit conditions and criteria must be complied with and are incorporated into the Contract Documents by reference in **Appendix A**.

### **Other Permits and Fees**

The Contractor is responsible for securing all other applicable permits and payment of all other applicable fees.

### 12.1. WAGE RATES

In accordance with the provisions of KRS 337.010, this project <u>will contain Kentucky</u> <u>Department of Labor prevailing wage rate requirements</u>. No Federal funds are anticipated for use on this project. Therefore, prevailing <u>Federal</u> wage rates <u>WILL NOT</u> be required on the Project.

Copies of the wage rate determination as prepared by the Kentucky Department of Labor for application on this project are attached and hereby incorporated as an integral portion of the Project Specifications as **Appendix 'D.** 

### 13.1. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

### Bid Item No. 1

Payment for this Bid Item shall be a lump sum payment for all clearing, grubbing and excavation as verified by and as approved by the Engineer. Removal items shall include but not be limited to all trees, vegetation, topsoil, foundations, structures, debris, old drainage items/ditch payement, stumps, brush and undergrowth and incidentals.

Payment shall be full compensation for all labor, equipment, materials, clearing, grubbing, removal, disposal and incidentals necessary to clear the site in order to complete the project in accordance with the Contract Documents.

### Bid Item No. 2

Payment for this Bid Item shall be a lump sum payment for a 500,000 gallon multi-leg elevated welded steel water storage tank (56' dia x 30' bowl height) in place, ready for use as verified by and as approved by the Engineer. Payment shall include all tank accessories and incidental hardware as well as hydrostatic testing and tank disinfection.

Lump Sum payment shall be full compensation for all labor, equipment, materials, handtools, furnishing, transporting, placing, tank and foundation design, foundation and foundation excavation, DGA subgrade materials, fill and outlet pipe to a point 5 feet outside the tank foundation perimeter, exterior ladders and platform assembly, interior and riser ladders, safety cage and anti-climb device, welding, weld testing, roof vent, riser manway, roof manways, level indicator gauge, overflow piping (including horizontal sections at ground level), headwall/concrete flume, stainless steel discharge guard/screen, interior silt trap, gaskets and sealing compounds, subgrade aggregate, backfilling and dressing, tank testing, sterilization and de-chlorination of sterilization water, and incidentals necessary to complete the elevated water storage tank in accordance with the Contract Documents.

### Bid Item No. 3

Payment for this Bid Item shall be for each hot tap of the respective size as verified and approved by the Engineer. Payment shall include stainless steel sleeve, tapping valve and valve stem/valve box extensions.

Payment shall be full compensation for all labor, equipment, tools, tapping machine, placing sleeve and valve, pressure testing sleeve prior to making tap, excavation, concrete blocking, materials, actual line tapping and incidentals necessary to complete the work in accordance with the Contract Documents.

### APPENDIX A

### KY DIVISION OF WATER APPROVAL LETTER

### Page i of i

# Distribution-Major Construction

W Daviess Co Water District Subject Item Inventory

Activity ID No.: APE20070002

## Subject Item Inventory:

Description			105 feet of 8-inch DI	500,000 gallon elevated storage tank	
ID Designation	0		water line	storage tank	
A		AIO033866	PORT9 water line	STOR2	

## Subject Item Groups:

		Description	Components	
Ü	ACT10 1	05 feet of 8-inch DI, 500,000 gallon elevated storage	STOR2 500,000 gallon elevated storage tank	
-		tank		
			PORT9 105 feet of 8-inch DI	
_				

$\frac{KEY}{ACTV} = Activity$	1)	
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AREA = Area

EQPT = Equipment

PERS = Personnel

STOR = Storage

TRMT = Treatment

PORT = Transport

MNPT = Monitoring Point

AIOO = Agency Interest COMB = Combustion

STRC = Structure

# Distribution-Major Construction

W Daviess Co Water District Facility Requirements Activity ID No.: APE20070002

Page 2 of 13

## GACT10 (continued):

# 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)]
Narrativ Addit	Narrative Requirements: Additional Limitations:
Condition No.	Condition
F-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

..... 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 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)] 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 T-3 **T**4

T-2

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)]

### Page 4 of 13

# Disamution-viajor Construction

W Daviess Co Water District Facility Requirements Activity ID No.: APE20070002

## PORT9 (continued):

## Limitation Requirements:

Condition		
No.	Parameter	Condition
L-7	Distance	When water lines and sewers cross,  1) water lines shall be laid such that either
	· · · · · · · · · · · · · · · · · · ·	
r-8	Distance	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.
19	Pressure	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.
L-10	Pressure	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.
L-Maner of	L-Pieres confiResidual Disintéction en	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 pmm and a Regidual Disinfection.

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.

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

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.

### Page 6 of 13

# Distribution-Major Construction W Daviess Co Water District Facility Requirements

Activity ID No.: APE20070002

## PORT9 (continued):

Narrative Requirements:

Additional Limitations:

Condition		
No.	Condition	
T-4	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]	novement. [Recommended Standards for Water

For each fire hydrant, auxiliary valves shall be installed in the hydrant lead pipe. [Recommended Standards for Water Works 8.3.3] Additional Limitations: T-5

Additional Limitations:

J-6

, T-7

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]

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 Additional Limitations: Water Works 8.0.2]

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] Additional Limitations:

Additional Limitations:

T-9

T-8

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)]

# Distribution-Major Construction

W Daviess Co Water District Facility Requirements Activity ID No.: APE20070002

## STOR2 (continued):

### Narrative Requirements: Additional Limitations:

### Condition Condition Š.

1.

shall follow the AWWA standards wherever they are applicable. Other materials of construction are acceptable when properly designed to meet the requirements in 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 his permit. [Recommended Standards for Water Works 7.0] Additional Limitations:

## Additional Limitations: T-2

The safety of employees must be considered in the design of any tank. The design of tanks shall

- meet or exceed the minimum requirements of pertinent safety laws and regulations in the areas where the tanks are constructed,
  - include ladders, ladder guards and balcony railings (where applicable),
- locate entrance hatches in safe places,
- provide railings or handholds where persons must transfer from an access tube to the water compartment, and
  - consider confined space entry requirements.

Additionally, if tanks have riser pipes over 8 inches in diameter, the tanks shall have protective bars over the riser openings inside of the tank. [Recommended Standards for Water Works 7.0.12]

### Additional Limitations: T-3

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]

## Additional Limitations: T-4

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]

## Additional Limitations: T-5

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]

## Additional Limitations: T-6

Fanks shall be constructed with no openings except properly constructed vents, manholes, overflows, risers, drains, control ports, and piping for inflow and outflow. Any pipes running through the roof or sidewall must be welded or properly gasketed. [Recommended Standards for Water Works 7.0.10]

## Distribution-Major Construction

W Daviess Co Water District Facility Requirements Activity ID No.: APE20070002

## STOR2 (continued):

## Narrative Requirements:

Additional Limitations:

Condition Condition No.

Additional Limitations: T-15

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]

Additional Limitations: T-16

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]

Additional Limitations: T-17

Storage structures shall be vented. Overflows shall not be considered as vents. Open construction between the sidewall and roof is not permitted. Vents shall

prevent the entrance of rainwater,

exclude birds and animals, and

c) exclide insects and dust (as mucn as companions with convergence of the screen (Recommended Standards for Water Works 7.0.9)

Additional Limitations: T-18

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] Adequate controls shall be provided to maintain levels in storage structures. The level controls shall be acceptable to the Division of Water. Level indicating

Additional Limitations: T-19

terments has If storage structures have a catwalk overthe 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]

533 C 1533

Additional Limitations: T-20

Proper protection shall be given to metal surfaces by

paints or other protective coatings and/or

cathodic protective devices. [Recommended Standards for Water Works 7.0.17]

Page 10 of 13

# Distribution-Major Construction

W Daviess Co Water District Facility Requirements Activity ID No.: APE20070002

Page 12 of 13

## STOR2 (continued):

### Narrative Requirements: Additional Limitations:

		orane and a second
	Condition	Additional Limitations:
Condition	No.	T-24

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 newstorage structures

remove all scaffolding, planks, tools, rags, and other items that are not part of the structural or operational facilities of the storage structure,

clean thoroughly by sweeping, scrubbing, using high-pressure water jets, or some equivalently effective means, and

use chlorine or chlorine compounds as subsequently described.

Finalize disinfection by

chlorination method 1, described in detail at AWWA Standard C652 Section 4.3.1,

chlorination method 2, described in detail at AWWA Standard C652 Section 4.3.2, or

chlorination method 3, described in detail at AWWA Standard C652 Section 4.3.3.

Following the finalization of disinfection, place storage structures into service if, and only if, Coliform monitoring applicable to the storage structure does not show See the following conditions for abreviated descriptions of the methods.

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]

Condition	No. Condition	

## If applicable, chlorination method 1 generally requires T-25

filling a storage structure to the overflow level with water providing a free chlorine Residual Disinfection >= 10 ppm and

i) completely draining the storage facility and refilling or **P P** 

otherwise reducing (in accordance with method 1) the free chlorine residual to a level appropriate for distribution. [Recommended Standards for Water

## If applicable, chlorination method 2 generally requires T-26

scrubbing or spraying the water-contact surfaces of a storage structure with a water solution having an available chlorine concentration = 200 ppm and <u>a</u>

purging of the strong chlorine solution and filling to the overflow level. [Recommended Standards for Water Works 7.0.18]

### **APPENDIX B**

### **GEOTECHNICAL INVESTIGATION**

### HANSON TESTING & ENGINEERING, INC.

### 2731 EASTSIDE PARK DRIVE EVANSVILLE, INDIANA 47715 PHONE: 812-477-8981

'HONE: 812-477-8981 FAX: 812-477-8982

February 14, 2007

Report No.: 161542

Mr. William Higdon
WEST DAVIESS COUNTY WATER DISTRICT
3400 Bittel Road
Owensboro, Kentucky

Project: Geotechnical Engineering Investigation

Proposed 500,000 Gallon Elevated Water Tank

West Louisville, Kentucky

Dear Mr. Higdon:

Hanson Testing & Engineering, Inc. is pleased to submit the following report of subsurface exploration and geotechnical engineering evaluation of the subject project.

This report briefly outlines the exploratory procedures used, exhibits the data obtained and presents our evaluation and recommendations relative to the geotechnical engineering aspects pertaining to the foundation design for the proposed elevated water tank.

The soil samples obtained during the field exploration will be stored at this office for a period of 60 days and then discarded unless otherwise instructed.

We appreciate having the opportunity to work with you on this project. If you have any questions regarding the information contained in this report or if we can be of further service, please contact us.

Sincerely,

Hanson Testing & Engineering,

Kent L. Lautner, P.E.

President

Cc: Jim Riney, P.E., P.L.S., HRG, PE

### GEOTECHNICAL ENGINEERING INVESTIGATION PROPOSED 500,000 GALLON ELEVATED WATER TANK WEST DAVIESS COUNTY WATER DISTRICT DAVIESS COUNTY, KENTUCKY

### 1.0 PURPOSE OF INVESTIGATION

The purpose of this investigation was to determine the subsurface conditions by drilling a series of test borings; perform a reconnaissance visit to the immediate site and to gather data from existing geologic publications on which to base recommendations relative to the foundation design for proposed water tank.

### 2.0 PROJECT INFORMATION

The project is located southwest of Owensboro, Kentucky along the north side of KY 56 just west of West Louisville. An existing 150,000-gallon elevated water tank is located to the immediate south of the proposed site. A Vicinity Map, which shows the general site location, is included in the Appendix.

The proposed structure is a 500,000 gallon elevated water tank. The estimated planned height of the tank is 60-ft. It will be supported by 6 legs within a 56-ft. diameter and a central load bearing riser. The maximum anticipated leg and riser loads are 750-kips and 1,500-kips respectively.

### 3.0 AREA GEOLOGY AND SEISMIC CONSIDERATIONS

According to Geologic Quadrangle Map for Curdsville, Kentucky (GQ-1039) published by the Kentucky Geological Survey; the site is covered by loess deposits over Carbondale formations of bedrock dated to the Middle Pennsylvanian Period.

The U.S. Department of Agriculture classifies the undisturbed surface soils as Memphis silty clay loam. The seasonal high groundwater table is greater than 6-ft. below the surface.

### 5.0 FIELD INVESTIGATION

A total of three (3) test borings were drilled within the footprint of the proposed water tank. The test holes were drilled in accordance with the *American Society for Testing and Materials (ASTM)* test designation D1586 using a truck-mounted Central Mine Equipment model 45B drill rig and hollow stem augers to advance the borings. Standard penetration tests were made using a 140 lb. "Automatic Safety Hammer" driving a Standard (Terzaghi) 1-3/8 in. ID split barrel sampler 2-ft. long. The results are illustrated on the logs under the heading "SPT".

The test holes were field located with surface elevations by the drilling crew. A Boring Location Plan showing the approximate boring locations is included in the Appendix.

Logs of the borings, which show visual descriptions of all soil data encountered using the Unified Soil Classification System, have been included in the Appendix. Groundwater observations, sampling information and other pertinent field data are included. In addition, a sheet defining the terminology used on the logs and explaining the standard penetration test procedure and a soil classification chart are provided for information purposes.

The soil samples obtained during the field exploration will be stored at this office for a period of 60 days and then discarded unless otherwise instructed.

### 6.0 EXPLORATORY FINDINGS

The boring records represent our interpretation of the subsurface conditions based on the field logs, laboratory test results and visual examinations of the field samples by the geotechnical engineer.

rainfall, stream elevations and soil permeability. Groundwater levels in natural occurring "clean" sand and gravel are considered more reliable.

The true groundwater levels can only be determined through observations made in cased holes over a long period of time. Construction of monitoring wells of this type was beyond the scope of this investigation.

### 7.0 LABORATORY TEST RESULTS

In addition to the field exploration, a laboratory-testing program was conducted to ascertain additional engineering characteristics of the underlying soils and rock. The laboratory-testing program included supplementary visual classifications and the following specific tests.

### 7.1 NATURAL MOISTURE CONTENT, ASTM D2216 (See boring logs in the Appendix)

7.2 UNCONFINED COMPRESSIVE STRENGTH ASTM D2166 (See graph data in Appendix)

7.3 ATTERBERG LIMIT DATA, ASTM D4318 (See graph data in Appendix)

7.4 MATERIAL FINER THAN 0.075 MM (PERCENT SAND), ASTM C117 (See boring logs in the Appendix)

### 8.0 GEOTECHNICAL RECOMMENDATIONS

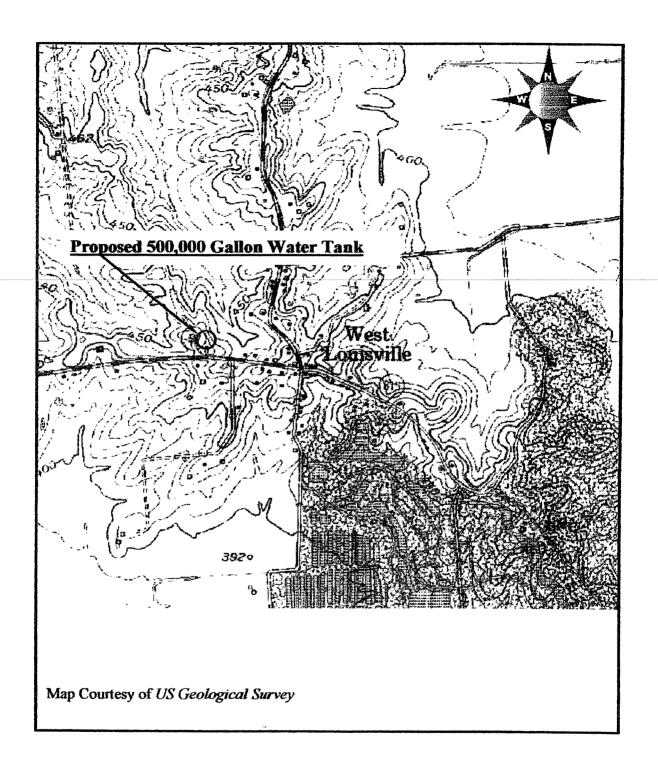
The following recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions. If there are any changes in the project criteria, including general location or foundation loading, a review of the changes should be made by the geotechnical engineer.

### 9.0 GENERAL CONDITIONS

This report has been prepared for the exclusive use for HRG, PLLC and the West Daviess County Water District, for the specific application to the subject project. All recommendations contained in this report have been made in accordance with generally accepted soil and foundation engineering practices.

The recommendations provided in this report were developed from the information obtained from the test borings, which indicate subsurface conditions only at these locations and at the particular time designated on the logs. The soil conditions at other locations may differ from the boring sites. If the strength of the soil is found to be less at other locations during the foundation installation process, additional recommendations and possibly field-testing may be required.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater or surface water within or beyond the site studied. Any statements in this report or on the test boring logs regarding odors, staining of soils or other unusual conditions observed are strictly for the information of our client.



### **VICINITY MAP**

Proposed 500,000 Gallon Elevated Water Tank West Louisville, Kentucky West Daviess County Water District

 Report No.: 161542	
Figure: VM - 1	Date: Feb. 12, 2007
Drawn By: KLL	Checked By: KLL
Scale: NTS	



### **GEOTECHNICAL BORING LOG**

**REPORT NO.: 161542** 

CLIENT: West Daviess County Water District

3400 Bittel Road

Owensboro, Kentucky 42301

Project: 500,000 Gallon Elevated Water Tank

West Louisville, Kentucky Date of Tests: February 7, 2007

Boring No.: B1

Page No.: 1 of 4

Drill Rig: CME 45B - Truck Mounted

Drill Crew: KL, DB

Boring Location: 80-ft. south, 80-ft west of northeast corner of property (center of proposed water tank).

Surface Elevation: 478.53

Benchmark: Southwest corner of south pier of existing water tank,

elevation 481.88

Depth of Water: 12'

Time: Upon drilling completion.

Depth of Water: 12'

Time: After 1 day.

DEPTH	MATERIAL DESCRIPTION	SPT	%, W	UCS, tsf	NOTES
1	Light brown clayey silt, medium stiff	1/5/4	25.4	1.5	
4	Light brown silt, soft	1/3/2	27.1	1.0	
7 8	Light brown silt, soft	1/2/2	26.4	1.0	
9	Light brown silt, very soft	1/2/1	24.2	0.25	
11					
12	Light brown clayey sand, loose	1/2/4	15.2	1.0	
14	/\ Light brown/ orange and light gray clayey sand, medium dense	2/5/7	19.2	3.0	Sand content = 65.1%

SPT = STANDARD PENETRATION TEST, BLOWS PER 6-INCH INCREMENT - ASTM D1586. THE "N" VALUE EQUALS THE SUM OF THE LAST TWO 6-INCH INCREMENTS.

UCS = UNCONFINED COMPRESSIVE STRENGTH (HAND PENETROMETER).

### GEOTECHNICAL BORING LOG

REPORT NO.: 161542

CLIENT: West Daviess County Water District

3400 Bittel Road

Owensboro, Kentucky 42301

Project: 500,000 Gallon Elevated Water Tank

West Louisville, Kentucky

Date of Tests: February 7, 2007

Boring No.: B1 Page No.: 3 of 4

Drill Crew: KL, DB

Drill Rig: CME 45B - Truck Mounted

Boring Location: 80-ft. south, 80-ft west of northeast corner of property

(center of proposed water tank).

Surface Elevation: 478.53

Benchmark: Southwest corner of south pier of existing water tank,

elevation 481.88

Depth of Water: 12'

Time: Upon drilling completion.

Depth of Water: 12'

Time: After 1 day.

DEPTH	MATERIAL DESCRIPTION	SPT	%, W	UCS, tsf	NOTES
31					
32	Black, dark gray and brown clay, very stiff	4/10/9	20.5	4.0	
33	***************************************				
35	Light brown, orange and light gray clay, medium stiff	2/5/5	27.1	1.5	
36					
37					
38	/				
40	Coal	27/53/ 43		*****	
41	Light gray clay				
42	Light gray clay				
43	,				
44	Light gray shale, weathered	43/ 50 at 1"	12.7	4.5+	

SPT = STANDARD PENETRATION TEST, BLOWS PER 6-INCH INCREMENT - ASTM D1586. THE "N" VALUE EQUALS THE SUM OF THE LAST TWO 6-INCH INCREMENTS.

UCS = UNCONFINED COMPRESSIVE STRENGTH (HAND PENETROMETER).

### **GEOTECHNICAL BORING LOG**

**REPORT NO.: 161542** 

CLIENT: West Daviess County Water District

3400 Bittel Road

Owensboro, Kentucky 42301

Project: 500,000 Gallon Elevated Water Tank

West Louisville, Kentucky

Date of Tests: February 7, 2007

Boring No.: B2 Page No.: 1 of 4 Drill Crew: KL, DB

Drill Rig: CME 45B - Truck Mounted

Boring Location: 52-ft. south, 80-ft west of northeast corner of property (center of north side of proposed water tank).

Surface Elevation: 477.54

Benchmark: Southwest corner of south pier of existing water tank,

elevation 481.88

Depth of Water: 17'

Time: Upon drilling completion.

Depth of Water: 12' Time: After 1 day.

DEPTH	MATERIAL DESCRIPTION	SPT	%, W	UCS, tsf	NOTES
1 2 3	Light brown clayey silt, medium stiff	2/4/4 ·	26.2	1.5	
2	Light brown silt, soft	2/2/2	27.8	1.0	
7	Light brown silt, soft	2/2/2	28.6	1.0	
ŧ	Light brown clayey silt, soft	2/2/2	22.5	0.75	
11 12 13	Light brown clayey sand, very loose	2/2/3	13.8	0.75	Sand content = 57.6%
14	Light brown/ orange and light gray clayey sand, very loose	2/3/2	14.7	0.75	

SPT = STANDARD PENETRATION TEST, BLOWS PER 6-INCH INCREMENT - ASTM D1586. THE "N" VALUE EQUALS THE SUM OF THE LAST TWO 6-INCH INCREMENTS.

UCS = UNCONFINED COMPRESSIVE STRENGTH (HAND PENETROMETER).

### GEOTECHNICAL BORING LOG

**REPORT NO.: 161542** 

CLIENT: West Daviess County Water District

3400 Bittel Road

Owensboro, Kentucky 42301

Project: 500,000 Gallon Elevated Water Tank

West Louisville, Kentucky

Date of Tests: February 7, 2007

Boring No.: B2
Page No.: 3 of 4

Drill Crew: KL, DB

Drill Rig: CME 45B - Truck Mounted

Boring Location: 52-ft. south, 80-ft west of northeast corner of property (center of north side of proposed water tank).

Surface Elevation: 477.54

Benchmark: Southwest corner of south pier of existing water tank,

elevation 481.88

Depth of Water: 17'

Time: Upon drilling completion.

Depth of Water: 12'

Time: After 1 day.

DEPTH	MATERIAL DESCRIPTION	SPT	%, W	UCS, tsf	NOTES
31	Fragmented sandstone, very loose, very wet, voids  Gray clay, soft	2/3/2	34.0	0.75-1.0	
37	/\ Coal	50 at 3 ½"			
434445	Light gray shale, weathered	23/37/ 50 at 4"	17.8	4.5+	

SPT = STANDARD PENETRATION TEST, BLOWS PER 6-INCH INCREMENT - ASTM D1586. THE "N" VALUE EQUALS THE SUM OF THE LAST TWO 6-INCH INCREMENTS.

UCS = UNCONFINED COMPRESSIVE STRENGTH (HAND PENETROMETER).

### GEOTECHNICAL BORING LOG

**REPORT NO.: 161542** 

CLIENT: West Daviess County Water District

3400 Bittel Road

Owensboro, Kentucky 42301

Project: 500,000 Gallon Elevated Water Tank

West Louisville, Kentucky

Date of Tests: February 8, 2007

Boring No.: B3
Page No.: 1 of 4
Drill Crew: KL, DB

Drill Rig: CME 45B - Truck Mounted

Boring Location: 52-ft. south, 108-ft west of northeast corner of property (center of west side of proposed water tank).

Surface Elevation: 477.92

Benchmark: Southwest corner of south pier of existing water tank,

elevation 481.88

Depth of Water: 15'

Time: Upon drilling completion.

Depth of Water: N/A Time: After 1 day.

DEPTH	MATERIAL DESCRIPTION	SPT	%, W	UCS, tsf	NOTES
1 2 3	Light brown clayey silt, medium stiff	2/5/4 ·	26.4	1.5	
2	Light brown clayey silt, soft	2/2/3	26.9	1.0	
7 8	Light brown clayey silt, medium stiff	2/3/3	26.7	1.25	
9	Light brown clayey silt, soft	1/3/2	23.6	0.75	
11	Light brown clayey sand, very loose	1/2/2	14.9	0.25	
14	Light brown, orange and light gray clayey sand, medium dense	2/5/7	23.5	2.5	

SPT = STANDARD PENETRATION TEST, BLOWS PER 6-INCH INCREMENT - ASTM D1586. THE "N" VALUE EQUALS THE SUM OF THE LAST TWO 6-INCH INCREMENTS.

UCS = UNCONFINED COMPRESSIVE STRENGTH (HAND PENETROMETER).

### GEOTECHNICAL BORING LOG

**REPORT NO.: 161542** 

CLIENT: West Daviess County Water District

3400 Bittel Road

Owensboro, Kentucky 42301

Project: 500,000 Gallon Elevated Water Tank West Louisville, Kentucky

West Louisville, Kentuck

Date of Tests: February 8, 2007

Boring No.: B3 Page No.: 3 of 4 Drill Crew: KL, DB

Drill Rig: CME 45B - Truck Mounted

Boring Location: 52-ft. south, 108-ft west of northeast corner of property

(center of west side of proposed water tank).

Surface Elevation: 477.92

Benchmark: Southwest corner of south pier of existing water tank,

elevation 481.88

Depth of Water: 15'

Time: Upon drilling completion.

Depth of Water: N/A Time: After 1 day.

DEPTH	MATERIAL DESCRIPTION	SPT	%, W	UCS, tsf	NOTES
31	Decayed vegetation, very soft  Greenish gray clay w/ fragmented sandstone, very soft	. 1/1/1	94.7	0.0	
38	Coal	25/22/ 36			
44 45	Light gray shale, weathered	53/50 at 1 ½"	7.9	4.5+	

SPT = STANDARD PENETRATION TEST, BLOWS PER 6-INCH INCREMENT - ASTM D1586. THE "N" VALUE EQUALS THE SUM OF THE LAST TWO 6-INCH INCREMENTS.

UCS = UNCONFINED COMPRESSIVE STRENGTH (HAND PENETROMETER).

Report No.: 161542

Project: West Louisville Elevated Water Tank

Boring Number: B1

Depth: 20'

Material: Light brown/ orange and light gray clay

### UNCONFINED COMPRESSIVE STRENGTH TEST, ASTM D2166

Initial Dry Density, pcf.

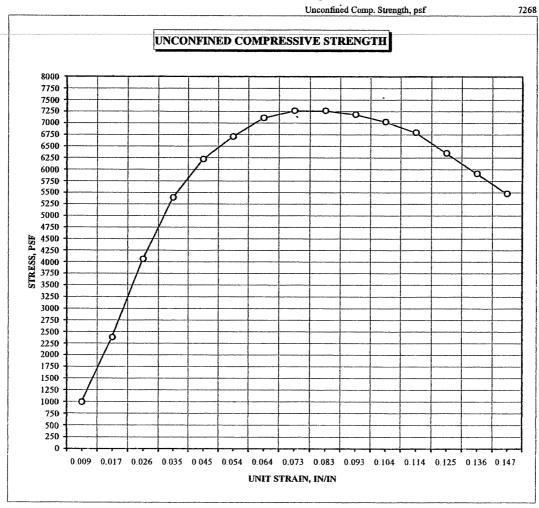
100.8

Initial Moisture Content, %:

25.2

Height to Diameter Ratio

2.1



HANSON TESTING & ENGINEERING INC. GEOTECHNICAL AND MATERIALS ENGINEERING ESTABLISHED 1962

Report No.: 161542

Project: West Louisville Elevated Water Tank

Boring Number: B3

Depth: 15'

Material: Light brown/ orange and light gray clayey sand

### UNCONFINED COMPRESSIVE STRENGTH TEST, ASTM D2166

Initial Dry Density, pcf. 102.2 Initial Moisture Content, %: 23.5 Height to Diameter Ratio 2.0 Unconfined Comp. Strength, psf UNCONFINED COMPRESSIVE STRENGTH 3200 3200 3000 2800 2600  $0.009 \quad 0.018 \quad 0.027 \quad 0.037 \quad 0.046 \quad 0.056 \quad 0.066 \quad 0.076 \quad 0.087 \quad 0.097 \quad 0.108 \quad 0.119 \quad 0.131 \quad 0.142 \quad 0.154 \quad 0.142 \quad 0.144 \quad 0.14$ UNIT STRAIN, IN/IN

HANSON TESTING & ENGINEERING INC. GEOTECHNICAL AND MATERIALS ENGINEERING ESTABLISHED 1962

### West Louisville Water Tank

```
MCE Parameters - Conterminous 48 States
 Latitude = 37.697889, Longitude = -087.291572
Data are based on the 0.10 deg grid set
 Period
             SA
  (sec)
             (%g)
   0.2
            058.4
                     Map Value, Soil Factor of 1.0
            020.0
   1.0
                     Map Value, Soil Factor of 1.0
  MCE Parameters x Specified Soil Factors
                     Soil Factor of 1.17
   0.2
            068.3
   1.0
            032.0
                     Soil Factor of 1.60
 MCE Parameters - Conterminous 48 States
 Latitude = 37.697889, Longitude = -087.291572
Data are based on the 0.10 deg grid set
 Period
             SA
  (sec)
            (%g)
             058.4
                     Map Value, Soil Factor of 1.0
   0.2
   1.0
            020.0
                     Map Value, Soil Factor of 1.0
  MCE SPECTRUM x SOIL FACTORS
  Fa = 1.17
  Fv = 1.60
              SA
  Period
   (sec)
              (%g)
   0.000
              027.3
                      0.4FaSs
   0.094
              068.3
                      To
   0.200
              068.3
                      T=0.2, FaSs
              068.3
   0.468
                      Ts
   0.500
              064.0
   0.600
              053.3
   0.700
              045.7
   0.800
              040.0
   0.900
              035.6
   1.000
              032.0
                      T=1.0, FvS1
   1.100
              029.1
   1.200
              026.7
   1.300
              024.6
   1.400
              022.9
   1.500
              021.3
   1.600
              020.0
   1.700
              018.8
   1.800
              017.8
   1.900
              016.8
   2.000
              016.0
```

### HANSON TESTING & ENGINEERING, INC. EVANSVILLE, INDIANA

### FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

### **NON-COHESIVE SOILS**

<b>DENSITY</b>		PARTICLE SIZE IDENTIFICATION				
	Very Loose	5 blows/ft. or less	Boulders	8" diameter or more		
	Loose	6 to 10 blows/ft.	Cobbles	3" to 8" diameter		
	Medium Dense	11 to 30 blows/ft.	Gravel	Coarse I "to 3"		
	Dense	31 to 50 blows/ft.		Medium 1/2" to 1"		
	Very dense	51 blows/ft. or more		Fine 1/4" to 1/2"		
			Sand	Coarse 2.00 mm to 4.75 mm		
			w.	Medium 0.42 mm to 2.00 mm		
		,		Fine 0.074 mm to 0.42 mm		
			Silt	0.005 mm to 0.074 mm		
			Clay	<0.005 mm		

### **COHESIVE SOILS**

			The second secon	
CONSISTENC	<u>Y</u>		PLASTICITY	
	Very Soft	3 blows/ft, or less	Degree of	Plasticity
	Soft	4 to 5 blows/ft.	Plasticity	Index
	Medium Stiff	6 to 10 blows/ft.	None to slight	0-4
	Stiff	11 to 15 blows/ft.	Slight	5-7
	Very Stiff	16 to 30 blows/ft.	Medium	8-20
	Hard	31 blows/ft. or more	High	Over 20
	Degree of	Percentage of	Approximate	
	Expansion	Swell	Plasticity Index (PI)	

ExpansionSwellPlasticity Index (Nonexpansive2 or less0 to 10Moderately expansive2 to 410 to 20Highly expansivemore than 4More than 20

Classifications on logs are made by visual inspection of samples.

Standard Penetration Test - Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 18 inches into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. The number of hammer blows for making the test is recorded on the drilling log in 6-inch increments. The sum of the last two 6-inch increments is considered the "N" value.

<u>Groundwater</u> observations were made at the end of the day's drilling unless otherwise noted. Porosity of the soil strata, weather conditions, site topography, etc. may cause changes in the water levels indicated on the logs.

### **APPENDIX C**

### KY STATE CLEARINGHOUSE REVIEW COMMENTS

The results of this review are valid for one year from the date of this letter. Continuation or renewal applications must be submitted to the State Clearinghouse annually. An application not submitted to the funding agency, or not approved within one year after completion of this review, must be re-submitted to receive a valid intergovernmental review.

If you have any questions regarding this letter, please feel free to contact my office at 502-573-2382.

Sincerely,

Lee Nalley

Kentucky State Clearinghouse

Attachments

Cc: Green River ADD

KIA

This review was based upon the information that was provided by the applicant through the Clearinghouse for this project. An endorsement of this project does not satisfy, or imply, the acceptance or issuance of any permits, certifications or approvals that may be required from this agency. Such endorsement means this agency has found no major concerns from the review of the proposed project as presented, other than those stated as conditions or comments.

Wilson, Jimmy:

Division of Planning has no comments.

The Natural Resources has made the following advisory comment pertaining to State Application Identifier Number KY200611141439

This review was based upon the information that was provided by the applicant through the Clearinghouse for this project. An endorsement of this project does not satisfy, or imply, the acceptance or issuance of any permits, certifications or approvals that may be required from this agency under Kentucky Revised Statutes or Kentucky Administrative Regulations. Such endorsement means this agency has found no major concerns from the review of the proposed project as presented other than those stated as conditions or comments.

The proposed project is subject to Division of Water (DOW) jurisdiction because the following are or appear to be involved: water storage tanks. Prior approval must be obtained from the DOW before construction can begin. The applicant must cite the State Application Identifier (SAI #KY200611141439) when submitting plans and specifications.

This project is consistent with the Daviess County Water Management Plan. It is approved for water management planning. It is approved for water withdrawal by the Water Quantity Management Section of DOW. From the application data, DOW ascertains that the proposed project is not located in a floodplain area; therefore, a floodplain construction permit is not required for this project.

The proposed project consists of the construction of a 500,000 gallon elevated storage tank to replace an existing 150,000 gallon tank. This tank will be located on the northern side of Highway 56 at the western side of West Louisville in Daviess County. The new tank will provide adequate pressure and flow for the project area. Completion of this project will provide improved water service to 4,400 households. There are no objections to the proposed project. However, final plans and specifications along with hydraulic analysis of the proposed project (including fill/drain cycles of the tank to justify adequate tank turn over) must be submitted to the Division of Water's Drinking Water Branch by a registered professional engineer in Kentucky. The applicant must receive a written approval from the Division of Water prior to the beginning of the construction.

If the construction area disturbed is equal to or greater than 1 acre, the applicant will need to apply for a Kentucky Pollutant Discharge Elimination System (KPDES) storm water discharge permit.

Utility line projects that cross a stream will require a Section 404 permit from the US Army Corps of Engineers and a 401 Water Quality Certification from DOW.

The Housing, Building, Construction has made the following advisory comment pertaining to State Application Identifier Number KY200611141439

no comments

### APPENDIX D

### KENTUCKY PREVAILING WAGE RATE REQUIREMENTS

### KENTUCKY DEPARTMENT OF LABOR PREVAILING WAGE DETERMINATION CURRENT REVISION LOCALITY NO. 009

Determination No. CR-4-009

Date of Determination: July 9, 2007

Project No. 030-H-00267-07-4

Type: Heavy/Highway

This schedule of the prevailing rate of wages for Locality No. 009, which includes Daviess and McLean 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-4-009.

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

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

CLASSIFICATIONS	R	ATE AND FRINGE BE	<u>NEFITS</u>		
HEAT & FROST INSULATORS	& ASBESTOS WORKERS:	FRINGE BENEFITS	12.18		
BOILERMAKERS:		BASE RATE FRINGE BENEFITS	16.91		
BRICKLAYERS:					
Bricklayers:		BASE RATE FRINGE BENEFITS			
Refractory:		BASE RATE FRINGE BENEFITS	•		
CARPENTERS:					
Carpenters:	BUILDING	BASE RATE FRINGE BENEFITS			
Piledrivermen:	BUILDING	BASE RATE FRINGE BENEFITS	•		
Carpenters:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	•		
Divers:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	\$24.30 9.85		
Piledrivermen:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	•		
MCLEAN COUNTY:					
CEMENT MASONS:		BASE RATE FRINGE BENEFITS	•		
Add \$.25 to base rate for 50-75 feet above finished grade level; 75-100 feet above finished grade level; and each additional 50 feet thereafter above finished grade level.					
DAVIESS COUNTY:			*****		
CEMENT MASONS:		BASE RATE FRINGE BENEFITS	\$22.00 11.41		

### **CLASSIFICATIONS**

### RATE AND FRINGE BENEFITS

LABORERS BUILDING: (Continued)

**BUILDING GROUP 3** 

Powderman, blasters: BUILDING BASE RATE \$19.72

FRINGE BENEFITS 8.59

### **HEAVY HIGHWAY GROUP 1**

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

HEAVY & HIGHWAY BASE RATE \$19.88 FRINGE BENEFITS 8.63

### **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 & HIGHWAYBASE RATE

\$20.13

FRINGE BENEFITS 8.63

### **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 \$20.18 FRINGE BENEFITS 8.63

### **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, troxler and concrete tester:

HEAVY & HIGHWAY BASE RATE \$20.78 FRINGE BENEFITS 8.63

### **CLASSIFICATIONS**

### RATE AND FRINGE BENEFITS

**OPERATING ENGINEERS BUILDING: (Continued)** 

### **BUILDING CLASS B:**

All air compressors (over 900 cu. ft. per min.), bituminous mixer, joint sealing machine, concrete mixer (under 21 cu. ft.), form grader, roller (rock), tractor (50 HP and over), bull float, finish machine, outboard motor boat, flexplane, fireman, boom type tamping machine, truck crane oiler, greaser on grease facilities servicing heavy equipment, switchman or brakeman, mechanic helper, whirley oiler, self-propelled compactor, tractair and road widening trencher and farm tractor with attachments (except backhoe, highlift and endloader), elevator (regardless of ownership when used for hoisting any building material), hoisting engine (1-drum or buck hoist), forklift (when used for masonry construction, firebrick masonry excluded), well points, grout pump, throttle-valve man, tugger, and electric vibrator compactor:

**BUILDING** 

BASE RATE

\$19.96

FRINGE BENEFITS1 11.90

### **BUILDING CLASS C:**

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

BUILDING

BASE RATE
\$19.19
FRINGE BENEFITS

11.90

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

### **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

\$22.95

FRINGE BENEFITS 11

11.90

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

Truck Mechanic:

	daily 0, 2001			
	CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
	PAINTERS BUILDING: (Continued)			
	Spray of mastics, creosotes, Kwi	nch Koate, and coal tar epox BUILDING	ry: BASE RATE FRINGE BENEFITS	
		HEAVY & HIGHWAY	FRINGE BENEFITS	7.84
	PLUMBERS AND PIPEFITTERS	:	BASE RATE FRINGE BENEFITS	11.15
	ROOFERS: (Excluding Metal Roo	OOFERS: (Excluding Metal Roofs)		\$12.00
SHEETMETAL WORKERS: (Including Metal Roofs)		uding Metal Roofs)	FRINGE BENEFITS	11.52
	SPRINKLER FITTERS:		BASE RATE	\$27.05
MCLEAN COUNTY ONLY:				
	TRUCK DRIVERS:			\$10.77
DAVIESS COUNTY ONLY:				
	TRUCK DRIVERS:	BUILDING	BASE RATE	\$10.00
DAVIESS & MCLEAN COUNTY:				
	TRUCK DRIVERS HEAVY & HIGHWAY:			
	Greaser, Tire changer:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	\$18.53 8.80

Single axle dump & flatbed, terrain vehicle when used to haul materials, semi-trailer or pole trailer when used to pull building materials & equipment, tandem axle dump, distributor, & mixer:

HEAVY & HIGHWAY

**HEAVY & HIGHWAY** 

BASE RATE

BASE RATE

FRINGE BENEFITS

\$18.83

\$18.76

8.80

FRINGE BENEFITS 8.80

BID SCHEDULE

### **Bid Schedule**

Bid unit prices shall be submitted in both written and numerical form. Total Bid Price shall be submitted in numerical form only. In the event of discrepancy, the written form will take precedence and be used in tabulating the total project bid.

Bid Item #1 Lump Sum for clearing, grub and incidentals; complete, in p	bing and excavation including all blace and ready for use.	labor, materials, equipment
At	Dollars and	Cents
	\$ Lumj	p Sum
	n multi-leg elevated welded steel value abor, materials, equipment, and inc	• ` `
At	Dollars and	Cents
	\$	
	Lump	o Sum
	es steel tapping sleeve, valve & val t, and incidentals; complete, in plac	
At	Dollars and (Per Each)	Cents
\$ Per Each	\$Tot	_1
Per Each	1 O I	ai

equipment, and molden	tals; complete, in place and ready for use.	
At	Dollars and	Cents
***************************************	(Per Linear Foot)	
\$	\$	
Per Linear Foot Total		1
	(MJ) fittings including all labor, materials, n place and ready for use.	equipment, and
At	Dollars and	Cents
	(Per Each)	
\$	\$	
Per Each  Bid Item #6 300 l.f. of 6-ft. high ch	Tota  ain link fence including all labor, materials n place and ready for use.	
Per Each  Bid Item #6  300 l.f. of 6-ft. high ch incidentals; complete, i	Tota  ain link fence including all labor, materials n place and ready for use.  Dollars and	s, equipment, and
Per Each  Bid Item #6 300 l.f. of 6-ft. high ch incidentals; complete, i  At	Tota  ain link fence including all labor, materials n place and ready for use.  Dollars and  (Per Linear Foot)	s, equipment, and
Per Each  Bid Item #6 300 l.f. of 6-ft. high ch incidentals; complete, i	Tota  ain link fence including all labor, materials n place and ready for use.  Dollars and  (Per Linear Foot)	s, equipment, and Cents
Per Each  Bid Item #6 300 l.f. of 6-ft. high ch incidentals; complete, i  At  Per Linear Foo  Bid Item #7 125 tons of DGA drive	ain link fence including all labor, materials in place and ready for use.  Dollars and (Per Linear Foot)  \$ tot  Total  /parking area rock including all labor, main place and ready for use.	Cents terials, equipment, and
Per Each  Bid Item #6 300 l.f. of 6-ft. high ch incidentals; complete, i  At  Per Linear Foo  Bid Item #7 125 tons of DGA drive incidentals; complete, i	ain link fence including all labor, materials in place and ready for use.  Dollars and (Per Linear Foot)  \$	Cents terials, equipment, and

The above unit prices shall include all labor, materials, equipment, safety and occupational regulations, overhead, profit, insurance, and all incidentals necessary to complete the work specified, complete, in place and ready to use.

Bidder acknowledges receipt of the following	ng Addenda:
Addendum #1 Dated	
Addendum #2 Dated	
Addendum #3 Dated	
Bidder understands that the Owner reserves any informalities in the bidding.	the right to reject any and all bids and to waive
The bidder agrees that this bid shall be good Ninety (90) calendar days following the school	· · · · · · · · · · · · · · · · · · ·
agreement attached within ten (10) days and	ance of this bid, bidder will execute the contract deliver a Surety Bond or Bonds as required by attached in the sum of (insert bid bond dollar
	(\$)
is to become the property of the Owner in th within the time setforth hereinabove, as liquiadditional expense to the Owner caused ther	
	Respectfully submitted:
	ByTitle
	Business Address & Zip Code

### SUBCONTRACTORS LISTING

All subcontractors performing work in fulfillment of this bid must be listed on this page with the information requested.

NAME	<u>ADDRESS</u>	<u>PHONE</u>	<u>FAX</u>	<u>CRAFT</u>
1				
2				
4				
5				-
6				
7				
8				
9				
10.				

### STATEMENT REQUIRED PURSUANT TO KRS45A.395

The provisions of KRS45A.395 require that any bidder or offeror submit a sworn statement in conformity with such statute as a prerequisite to a determination that such bidder or offeror is a responsible bidder.

The undersigned, individually and as	the (office				
or title) of	(bidder or offeror) states under				
penalty of perjury that neither he (she	), nor, to the best of his (her) knowledge, anyone				
acting on behalf of Bidder or Offerd	or, has knowingly violated any provision of the				
	nonwealth of Kentucky and that the award of a				
contract to the Bidder or Offeror will not violate any provision of the campaign finance laws of the Commonwealth. "Knowingly" means, with respect to conduct or to a circumstance described by a statute defining an offense, that a person is aware or should					
				have been aware that his conduct is of t	that nature or that the circumstance exists.
				This the day of	2007
Tills the day or	, 2007.				
(Company Name)					
The state of the s					
By:					
(Typed or printed name)	(Signature)				
Title:					

### **VENDOR'S STATEMENT PURSUANT TO KRS45A.343**

Effect of adoption – Contracts recompliance with specified KR noncompliance. (KRS 136 – Corp	t provisions of KRS 45A.345 to 45A.460—quired to mandate revealing of violations of and RS chapters — Effect of nondisclosure or porate taxes; KRS 139 — Sales & use taxes; KRS Wage and hour; KRS 338 — Occupational safety; 342 — Workers Comp.)		
The undersigned, as a duly authorized of pursuant to KRS45A.343 states;	ficer of,		
1. To the best of my knowledge, information and belief, has not been finally determined to have violated any of the provisions of KR Chapters 136, 139, 141, 337, 338, 341, or 342 that apply to it within the five year period preceding this statement.			
	acknowledges that it will be required to be in compliance with those provisions of KRS Chapters 136, 139, 141, 337, 338, 341 and 342 that apply to it for the duration of the Contract to be entered into with the		
342, or to comply with the applicable	acknowledges that if it fails to reveal any RS Chapters 136, 139, 141, 337, 338, 341, or provisions of those statutes for the duration of grounds for		
a. Cancel its contract with	, and		
b. Disqualifycontracts awarded by	from eligibility for future for a period of two years.		
This theday of	, 2007.		
(Company Name)	_		
By:(Typed or printed name)	(Signature)		
Title			