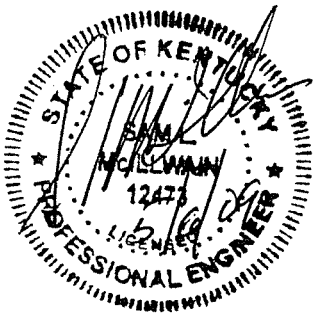
VOLUME I OF
CONTRACT DOCUMENTS
FOR THE

GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

STATE ROUTE 1846
1.0 MG WATER STORAGE RESERVOIR

KIA #WX210990004



WATER MANAGEMENT SERVICES, LLC
2 INTERNATIONAL PLAZA, SUITE 401
NASHVILLE, TENNESSEE 37217
(615) 366-6088
Fax (615) 366-6203

WMS No. 08194

PROPOSAL SECTION

GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

INVITATION TO BID
FOR
CONSTRUCTION OF

STATE ROUTE 1846
1.0 MG WATER STORAGE RESERVOIR

RECEIPT OF PROPOSALS

Sealed Proposals for the construction of the State Route 1846 1.0 MG Water Storage Reservoir will be received at the office of the Green River Valley Water District, 85 East Les Turner Road, Cave City, Kentucky 42127, Attention: David Paige, Manager on or before 10:00 a.m. local time on Thursday, May 28, 2009 and immediately thereafter all bids will be publicly opened and read aloud.

Sealed envelopes containing Proposals shall be marked "State Route 1846 1.0 MG Water Storage Reservoir." No Proposal will be considered unless it is made on the Proposal form which is included in the Contract Documents. **The Proposal must not be removed from the Contract Documents** with which it has been bound by the Green River Valley Water District. This Proposal must be addressed as indicated in the previous paragraph. It shall be the Bidder's responsibility that the envelope be properly addressed to ensure that the Proposal is received on or before the appropriate time.

The project will include the following described construction:

> The construction of a 1.0 million gallon ground level wire-wound, circular, prestressed concrete water tank with associated site work, fire hydrant assemblies, yard piping, valves, valve pit, access road, level controls, and other miscellaneous work as shown on the Construction Drawings or indicated in the Contract Specifications. A subsurface soil investigation will be required by the Tank Contractor to determine the soils bearing pressure for the design of the foundation. A minimum of three (3) borings should be drilled with one at the tank center and two (2) at 180 degrees apart on the foundation circle diameter at a depth of 30 feet. The report will be written on the results of the test, and this will form the basis of the design. The investigation shall be completed by a qualified and independent geotechnical engineer. All cost required for the subsurface investigation and report shall be the responsibility of the Contractor.

This project will be funded by KIA Grant #WX21099004 and SAI# KY20090212-0137.

The attention of the bidders is directed to the requirements of compliance with certain Federal Laws and Regulations, including Equal Opportunity Contract Compliance Notice.

Minority bidders are encouraged to bid.

CONTRACT DOCUMENTS

All work must be performed in accordance with the Contract Documents which are available for inspection at the following locations:

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

McGraw Hill Construction
1604 Elm Hill Pike, Suite 200
Nashville, Tennessee 37210

Water Management Services, LLC
2 International Plaza, Suite 401
Nashville, Tennessee 37217

AGC / F. W. Dodge Corporation
1811 Cargo Court
Louisville, Kentucky 40299

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

Associated Builders and Contractors
1217 Broadway Avenue
Bowling Green, KY 42104

Copies may be obtained at the office of Water Management Services, LLC, 2 International Plaza, Suite 401, Nashville, Tennessee 37217 (telephone: 615/366-6088). A deposit of $200.00 must be made for each set obtained. The deposits of all bidders, except the successful bidder, will be refunded without any deduction upon return of the Bid Documents (drawings and specifications) to Water Management Services, LLC in good condition and within 15 calendar days subsequent to the opening of bids. Non-bidders and bidders who have taken out additional sets will be refunded $150.00 under the same conditions of return. No refund will be made for documents received after this fifteen-day period.

BID SECURITY

Each Proposal shall be accompanied by a certified or cashier's check or a satisfactory bid bond payable to the Green River Valley Water District in amount not less than five (5) percent of the Base Bid as a guarantee that the bidder will, within fifteen (15) days after the date of the award of the Contract, execute an Agreement and file bonds and insurance as required by the Contract Documents if his Proposal is accepted.

If an intended awardee fails to execute and file an Agreement, bonds and insurance as required by the Contract Document, the entire amount of the security submitted with the Proposal shall be forfeited.

HOLDING OF PROPOSAL

No bid shall be withdrawn after the opening of the Proposals without the consent of the Green River Valley Water District for a period of sixty (60) days after the scheduled time of the closing of bids. The bid securities of all bidders, except those submitted with the three lowest acceptable bidders, will be returned within fifteen (15) days after the time of the opening of the bids. The bid security accompanying the three lowest acceptable proposals may be held by the Green River Valley Water District until a construction contract has been executed and a satisfactory Performance Bond in the sum of the full amount of the Contract has been delivered to the Green River Valley Water District.

TIME FOR COMPLETION

The successful bidder shall be required to fully complete all work in accordance with the terms and conditions of the Contract Documents within **240** consecutive calendar days from and including the date to start work established in a written order from the Green River Valley Water District.

NOTE: The Contractor's attention is directed to the Provisions for Liquidated Damages as provided in the Special Conditions and the Contract Agreement, in addition to the Excess Cost of Engineering as set forth in Paragraph 7.6 of the General Conditions.

AWARD OF CONTRACT

The award of any Contract will be made by the Green River Valley Water District to the lowest responsive, responsible bidder. Responsible bidder will be defined as one who furnished satisfactory evidence that the bidder has the experience and the ability and that he has sufficient capital and facilities to enable him to perform the work successfully and to complete the work within the time specified in the Contract Document. At a minimum, a responsible and responsive bidder shall be appropriately licensed, have provided the required bid bond, have the capability of meeting the bond and insurance requirements, and be in compliance with Federal, State and local laws and regulations applicable to the project.

The Green River Valley Water District reserves the right to reject any Proposal for failure to comply with all requirements of the notice or of any of the Contract Documents; however, it may waive any minor defects or informalities at its discretion. The Green River Valley Water District further reserves the right to reject all Proposals.

Plans and specifications for this project were prepared by Water Management Services, LLC.

Dated at Cave City, Kentucky this 7th day of May, 2009.

GREEN RIVER VALLEY WATER DISTRICT

BY: David Paige, Manager

GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

STATE ROUTE 1846
1.0 MG WATER STORAGE RESERVOIR

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INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

1. EXAMINATION OF PROCUREMENT DOCUMENTS AND SITE

1.1 Before submitting a Bid, each Bidder must (a) examine the Procurement Documents thoroughly, (b) become familiar with federal, state, and local laws, ordinances, rules, and regulations that may in any manner affect cost, progress or furnishing the Goods and Special Services, (c) study and carefully correlate Bidder's observations with the Procurement Documents, and (d) if specified or if, in Bidder's judgment, any local condition may in any manner affect cost, progress or furnishing the Goods and Special Services, visit the site to become familiar with local conditions.

1.2 Upon request Owner will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of his Bid. Contact for access to the site should be requested to Green River Valley Water District, David Paige, at 270-773-2135 for arrangements.

1.3 The submission of a Bid will constitute an incontrovertible representation by the Bidder that he has complied with every requirement of this Article 1 and that the Procurement Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for furnishing the Goods and Special Services.

2. EASEMENTS

Portions of the improvements under this project will be constructed on private property for which easements have been secured by the Owner. Work performed on or use of such easements shall be subject to the provisions of the easement agreements on file and open to inspection in the office of the Owner.

3. INTERPRETATION OF CONTRACT DOCUMENTS

Questions regarding documents, discrepancies, omissions, or intent of the Specifications or Drawings shall be submitted in writing to the Owner through the Engineer at least 10 days prior to opening of bids to provide time for issuing and forwarding an addendum. Any interpretation of the Contract Documents will be made only by addendum duly issued or delivered by the Owner to each person receiving a set of documents. The Owner will not be responsible for any other explanations or interpretations of the Contract Documents.

4. EXAMINATION OF BIDDING DOCUMENTS

Each bidder, by making his bid, represents that he has read and understands the bidding documents. The bidder shall include in his bid prices any and all costs that may be necessary to complete the work in accordance with the requirements of the Contract Documents.

5. MATERIAL SUBSTITUTION

Each bidder shall base his bid upon the materials and equipment as described in the bidding documents. The successful Contractor will not be allowed to make any substitutions on his own initiative but, in each instance, will be required to obtain authorization from the Owner before installing any work in variance with the requirements of the Contract Documents.

6. APPROXIMATE QUANTITIES

On all items on which bids are to be received on a unit price basis, the quantities stated in the bid will not be used in establishing final payment due the Contractor. The quantities stated, on which unit prices are invited, are approximate only. Bids will be compared on the basis of number of units stated in the bidding schedule. Payment on the Contract on unit price items will be based on the actual number of units installed in the completed work.

7. PREPARATION OF BID

Only bids which are made out on the bid form included in this document will be considered. **The bid form must not be separated from this document.** Amounts are to be shown in both words and figures. In case of discrepancy between words and figures, the words shall prevail unless it clearly appears, in Owner's opinion that the words rather than the figures are in error. If any portion of the bid is required to be given in unit prices and totals, the unit prices shall prevail unless it clearly appears, in Owner's opinion that the unit prices rather than the totals are in error. If a discrepancy exists between the total base bid and the true sum of the individual bid items, the true sum shall prevail. A bid will be rejected if it does not contain a price for each and every item named in the bidding schedule. Bidders are warned against making any erasures or alterations of any kind, and bids which contain omissions, erasures, conditions, alterations, or additions not called for may be rejected.

8. SIGNING OF BID

If the bidder is a corporation, the legal name of the corporation shall be set forth together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If bidder is a partnership, the true name of the firm shall be set forth together with the signatures of all the partners. If the bidder is an individual, his signature shall be inscribed. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a power of attorney must be on file with the Owner prior to opening bids or submitting bids; otherwise, the bid may be regarded as irregular.

9. BID SECURITY

No bid will be considered unless accompanied by a bid security as defined in the Invitation to Bid as a guarantee that, if the bid is accepted, the bidder will execute the Agreement and file bonds and insurance as required by the Contract Documents within 15 days from the date of the award of the Contract.

10. RETURN OF BID SECURITIES

The security of the three lowest bidders will be returned after the execution of the Agreement with the successful bidder and the approval of his bonds and insurance. The security of all other bidders will be returned promptly after the bids have been opened and reviewed by the Owner. If all bids are rejected, the securities will be returned at the time of rejection.

11. AGREEMENT, BONDS, INSURANCE

The attention of bidders is specifically directed to the General Conditions of the Contract and to the forms of Agreement and bonds to be executed and types of insurance to be taken out in the event a Contract award is made.

The attention of bidders is specifically directed to the General Conditions of the Contract relative to the Certificate of Insurance requirements. If the Surety declines to provide the Certificate of Insurance containing the specified cancellation clause verbiage, the Surety shall be required to provide a separate letter to the Owner/Engineer stating the Surety shall notify the Certificate holder in writing thirty (30) days prior to cancellation, reduction, or change in coverage on this project.

12. BID SUBMITTAL

Each bid, properly signed, together with the bid security and all documents bound herewith, shall be enclosed in a sealed envelope addressed and entitled as specified in the Invitation to Bid and delivered to the office designated in the Invitation to Bid. All addenda issued shall be included with the documents at the time of bid submittal. Reference shall be made to the Invitation for proper address as required on the envelope.

13. WITHDRAWAL OF BID

Any bid may be withdrawn at any time prior to the hour fixed in the Invitation to Bid for the opening of bids, provided that a request in writing, executed by the bidder or his duly authorized representative for the withdrawal of such bid, is filed with the Owner prior to the time specified for opening of bids. The withdrawal of a bid will not prejudice the right of a bidder to file a new bid.

14. DESIGNATION OF SUBCONTRACTORS

Each bidder shall list on the form included in these documents the names and addresses of all subcontractors who will perform work or labor or render service to the bidder on or about the construction site. Each bidder shall show on the form the portion of the work to be done by each subcontractor.

15. QUALIFICATION OF BIDDERS

It is the intention of the Owner to award a Contract only to a bidder who furnishes satisfactory evidence that he has sufficient capital, facilities, and plans to enable him to prosecute the work successfully and promptly and to complete the work within the time specified in the Contract Documents. Furthermore, it is the intention of the Owner to award a Contract only to a bidder with a satisfactory record of performance, skill, integrity and judgment. Each bidder shall submit with his bid a listing of past projects including references. A form is provided in the Proposal for listing of this information.

16. DISQUALIFICATION OF BIDDERS

More than one bid for the same work described in this document from an individual, firm or partnership, a corporation or an association under the same of different names will not be considered. Reasonable grounds for believing that any bidder is interested in more than one bid for the work contemplated will cause the rejection of all bids in which such bidder is interested. If there are reasonable grounds for believing that collusion exists among the bidders, the bids of the participants in such collusion will not be considered. In addition, if at any time it shall be found that the person, firm, or corporation to whom the Contract has been awarded has, in presenting any bid or bids, colluded with any other party or parties, then the contract so awarded shall be null and void, and the Contractor and his sureties shall be liable to the Owner for all loss or damage which the Owner may suffer thereby, and the Owner may advertise for new bids for said work. The attention of each bidder is directed to the Non-collusion Affidavit in the Proposal and each bidder shall submit an executed form with his bid.

17. BID OPENING

Bids will be opened and the prices bid will be read aloud publicly at the time and place indicated in the Invitation to Bid. Bidders or their agents are invited to be present.

18. AWARD OF CONTRACT

The award of any Contract or Contracts will be made to the lowest responsive responsible bidder or bidders. The Owner reserves the right to reject any or all bids or to waive irregularities or informalities at its discretion.

19. EFFECTIVE DATE OF AWARD

If a Contract is awarded by the Owner, such award shall be effective when formal notice of such award signed by the authorized representative of the Owner has been delivered to the intended awardee or mailed to him at the main business address shown on his bid by some officer or agent of the Owner duly authorized to give such notice.

20. EXECUTION OF AGREEMENT

Copies of the Agreement, in the number stated in the form of Agreement, shall be executed by the successful bidder and returned, together with the required bonds and insurance within 15 days from and after the date of the award of the Contract. Effective date of bonds shall be the same or later than the date of the Agreement. Failure of a successful bidder to execute the Agreement and file required bonds and insurance within the required time shall be just cause for the annulment of the award. On failure of a successful bidder to execute the Agreement and file the required bonds and insurance within the required time, he shall forfeit his bid security as agreed hereinbefore. Upon annulment of an award as aforesaid, the Owner may then award a Contract to the next lowest, responsible bidder.

21. COMMENCEMENT AND COMPLETION OF WORK

The successful bidder shall commence work within 15 calendar days from and after the issuance by the Owner of a Written Notice to Proceed and shall complete all work in accordance with the terms and conditions of the Contract Documents within **240** consecutive calendar days from and after the date of the Notice to Proceed. The Notice to Proceed will be issued within 10 days after award of the Contract.

22. LIQUIDATED DAMAGES

The Contractor's attention is directed to the Provisions for Liquidated Damages as provided in the Special Conditions and in the Contract Agreement, in addition to the Excess Cost of Engineering as set forth in Paragraph 7.6 of the General Conditions. Bidder further agrees to pay as liquidated damages the sum of $200.00 per day for each consecutive calendar day thereafter as provided in Paragraph 13 of the Special Conditions.

23. UNCLASSIFIED EXCAVATION

This Contract includes excavation on an unclassified basis. The cost of all excavation necessary for the installation of the water lines, sewer lines and appurtenances required under this Contract will be merged into the price per foot for pipe installed or appurtenances thereto. Not distinction will be made insofar as payment is concerned between earth and rock. The bid item for unclassified excavation covers additional excavation required by removing unsuitable material (subgrade) authorized by the Engineer in the field.

A subsurface soil investigation will be required by the Tank Contractor to determine the soils bearing pressure for the design of the foundation. A minimum of three (3) borings should be drilled with one at the tank center and two (2) at 180 degrees apart on the foundation circle diameter at a depth of 30 feet. The report will be written on the results of the test, and this will form the basis of the design. The investigation shall be completed by a qualified and independent geotechnical engineer. All cost required for the subsurface investigation and report shall be the responsibility of the contractor.

24. PAYMENT FOR EXCESS COSTS

The successful Contractor will be required to pay for the excess cost of field engineering and inspection as defined in the General Conditions of the Contract, if extensions of time are granted by Owner because of avoidable delays as therein defined.

25. UNDERGROUND FACILITIES

The information and data shown or indicated in the Contract Drawings with respect to existing underground facilities is based on available information and record drawings. The Owner/ Engineer shall not be responsible for the accuracy or completeness of such information or record drawings. The Contractor shall have full responsibility for reviewing and checking all such information and data for locating all underground facilities shown or indicated on the Contract Drawings, for coordinating of the work with the Owner, and for the safety and protection thereof and repairing any damage thereto resulting from the work--the cost of which will be considered as having been included in the Contract price.

If underground facilities are uncovered or revealed which were not shown or indicated in the Contract Drawings and which the Contractor could not reasonably have been expected to be aware of, the Contractor shall promptly, after becoming aware thereof and before performing any work affected thereby, give written notice to the Owner/Engineer. The Engineer will promptly review the underground facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the underground facility and the Contract Document will be amended or supplemented to the extent necessary.

26. DELETIONS BY OWNER

Portions or segments of this work may be deleted by the Owner at the Owner's discretion during the course of construction operations because of funding considerations and/or unforeseen or unknown difficult construction conditions which may arise during the course of the work and which this Contract does not cover. Anticipated profit claims for such deletions will not be allowed.

27. NOTICE OF INTENT FOR STORMWATER DISCHARGES

The Bidder's attention is directed to the requirement for executing a Notice of Intent (NOI) for storm water discharges upon award of this project. This NOI must be executed by the Contractor after award of the project. The Owner will pay required fee and transmit the NOI package to the State for review and approval.

28. PREVAILING WAGE DETERMINATION

The Contractor shall be aware and take into consideration wage rates which will be in effect for this project. These rates can be found in the Special Conditions of this document.

PROPOSAL TO

GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

STATE ROUTE 1846
1.0 MG WATER STORAGE RESERVOIR

Full Name of Bidder _____

Main Business Address _____

Place of Business _____

TO: THE GREEN RIVER VALLEY WATER DISTRICT (hereinafter called "Owner")

The undersigned, as bidder, declares that the only person or parties interested in this Proposal as principals are those named herein, that this Proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the location of the proposed work, the proposed forms of Agreement and Bonds, and the Contract Drawings and Specifications for the above-designated work, all of which are on file at the Green River Valley Water District and all other documents referred to or mentioned in the Contract Documents, the Contract Drawings and Specifications, including Addenda No. _____, _____, _____, and _____ issued thereto; and he proposes and agrees if this Proposal is accepted that he will contract with the Green River Valley Water District in the form of the copy of the Agreement included in these Contract Documents to provide all necessary machinery, tools, apparatus and other means of construction, including utility and transportation services necessary to do all the work, and furnish all the materials and equipment specified or referred to in the Contract Documents in the manner and time herein prescribed and according to the requirements of the Owner as therein set forth, furnish the Contractor's Bonds and Insurance specified in the General Conditions of the Contract, and to do all other things required of the Contractor by the Contract Drawings, and that he will take in full payment therefore the sums set forth in the following Bidding Schedule.

II. BIDDING SCHEDULE

A. LUMP SUM CONSTRUCTION ITEM

Item No. 1

For the furnishing, installation and testing of a 1,000,000 gallon ground-level wire-wound circular prestressed concrete water storage reservoir including all site work, clearing and grubbing, excavation, grading, piping, access road construction, drainage, fencing, gate, and other related appurtenances, complete in place and ready for use.

@_____ Dollars _____ Cents

$_____ _____
per lump sum Total

B. UNIT PRICE CONSTRUCTION ITEMS

Item No. 2

700 linear feet of Class 50 ductile iron pipe water main or AWWA C905 DR18 Pressure Class 235 PVC water main, 16-inch internal diameter, including 3-inch detection tape and trace wire, under and/or outside roadway, complete in place and ready for use.

@_____ Dollars _____ Cents

$_____ _____
per linear foot Total

Item No. 3

1 - 6-inch resilient gate valve (restrained), including valve box, complete in place and ready for use.

@_____ Dollars _____ Cents

$_____ _____
each Total

Item No. 4

750 pounds of miscellaneous D.I.P. fittings (restrained), complete in place.

@_____ Dollars _____ Cents

$_____ _____
per pound Total

Item No. 5

1 - Fire hydrant assembly, complete in place and ready for use.

@_____ Dollars _____ Cents

$_____ _____
each Total

Item No. 6

100 square yards of asphalt access roadway from existing State Route 1846 to right-of-way of property including 8-inches of Class compacted crushed stone base and 2-inches of Asphalt Surface Type C.W. Binder, complete in place and ready for use.

@_____ Dollars _____ Cents

$_____ _____
per square yard Total

Item No. 7

1,500 square yards of crushed stone base for access roadway, 15-foot wide from right-of-way to tank site, including 10-inches of compacted crushed stone in accordance with Section 805 of the Kentucky Department of Highways Standard Specifications, complete in place and ready for use.

@_____ Dollars _____ Cents

$_____ _____
per square yard Total

Item No. 8

1,400 linear feet of topsoil and seeding of trenches, complete in place.

@_____ Dollars _____ Cents

$_____ _____
per linear foot Total

Item No. 9

10 cubic yards of Class C concrete (2,000 psi) for thrust blocking, complete in place.

@_____ Dollars _____ Cents

$_____ _____
per cubic yard Total

C. SUPPLEMENTAL UNIT PRICE ITEMS ORDERED BY THE ENGINEER

Item No. 10

200 cubic yards of supplemental rock excavation.

@_____ Dollars _____ Cents

$_____ _____
per cubic yard Total

Item No. 11

200 cubic yards of stone refill material.

@_____ Dollars _____ Cents

$_____ _____
per cubic yard Total

Item No. 12

200 cubic yards of supplemental dirt excavation.

@_____ Dollars _____ Cents

$_____ _____
per cubic yard Total

Item No. 13

75 cubic yards of Class C concrete refill material.

@_____ Dollars _____ Cents

$_____ _____
per cubic yard Total

Item No. 14

75 linear feet of test drilling.

@_____ Dollars _____ Cents

$_____ _____
per linear foot Total

TOTAL BASE BID

The sum of item 1 through 14 is

_____
(in writing)

Dollars and _____ Cents
(in writing)

TOTAL BID $ _____
(in figures)

III. PROPOSAL CONDITIONS

A. It is expressly understood that quantities in the Bidding Schedule for Unit Price Items are approximate only and that payment on a Contract will be made only on the actual quantities of work completed in place, measured on the basis defined in the Contract Conditions and the Contract Specifications.

B. The undersigned has carefully checked the above Bidding Schedule against the Contract Drawings and Specifications before preparing this Proposal and accepts the said quantities to be substantially correct, both as to classification and amount, and as correctly listing the complete work to be done in accordance with the Contract Drawings and Specifications.

C. If this Proposal is accepted and the undersigned shall fail to contract as aforesaid, and to give the bond for faithful performance required by the General Conditions of Contract and by law, and to provide all insurance as required by the Contract Documents within fifteen (15) days after the date of the award of the Contract, the Green River Valley Water District at its option, determined that the bidder has abandoned this Contract and thereupon this Proposal and the acceptance thereof shall be null and void, and the forfeiture of such security accompanying this Proposal shall operate and the same shall be the property of the Green River Valley Water District.

IV. BID SECURITY

Accompanying this Proposal is a _____,

in the amount of _____

Dollars ($_____).

Note: (a) Insert the words "Cash," "Cashier's Check," "Certified Check" or "Bid Bond" as the case may be.

(b) Amount must be equal to at least that stated in the Notice to Bidders but not less than that required by State Statutes.

V. GENERAL

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the conditional acceptance of this bid, bidder will execute the formal Contract attached within 15 days and deliver the Surety Bond or Bonds and insurance as required by the Contract Documents. The bid security attached in the sum of _____

_____

Dollars ($_____) is to become the property of the Owner in the event the Contract, Insurance and Bonds are not executed within the time above set forth.

VI. STARTING AND COMPLETION AND LIQUIDATED DAMAGES

If awarded a Contract under this Proposal, the Undersigned proposes to start work at the site within fifteen (15) calendar days after the receipt from the Owner of a written Notice to Proceed. The Undersigned further agrees to fully complete all work covered by this Proposal to the point of final acceptance by the Owner within 240 consecutive calendar days from and including the date of receipt from the Owner of a written Notice to Proceed.

NOTE: The Contractor's attention is directed to the provisions for Liquidated Damages as provided in Paragraph 13 of the Special Conditions and in the Agreement Section, in addition to the Excess Cost of Engineering as set forth in Paragraph 7.6 of the General Conditions.

VI. PROPOSAL SIGNATURE

State of _____)
)ss
County of _____)

_____, being first duly sworn on oath deposes and says that the bidder on the above proposal is organized as indicated below and that all statements herein made are made on behalf of such bidder and that this deponent is authorized to make them.

_____, also deposes and says that he has examined and carefully prepared his bid proposal from the Contract Drawings and Specifications and has checked the same in detail before submitting this Proposal or bid; that the statements contained herein are true and correct.

(a) Corporation

The bidder is a corporation organized and existing under the laws of the State of _____, which operates under the legal name of _____, and the full names of its officers are as follows:

President _____

Secretary _____

Treasurer _____

Manager _____

and it (does) or (does not) have a corporate seal. The (name) _____ is authorized to sign construction proposals and contracts for the company by action of its Board of Directors taken on _____, a certified copy of which is hereto attached. (Strike out this last sentence if not applicable.)

(b) Partnership

The bidder is a partnership consisting of individual partners whose full names are as follows:

_____ _____

_____ _____

The partnership does business under the legal name of:

_____.

(c) Individual

The bidder is an individual whose full name is _____ _____, and, if operating under a trade name, said trade name is _____.

Dated _____, 200___.

_____
Legal Entity

(Seal - If Corporation)

(Sign Here) By: _____

_____

Telephone No. _____

Subscribed and sworn to before me this _____ day of _____, 200___

_____
Notary Public

My Commission Expires:

_____

CONTRACTOR'S BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____ (hereinafter called the Principal) and _____ _____ (hereinafter called the Surety), a corporation chartered and existing under the laws of the State of _____ with its principal offices in the City of _____ and authorized to do business in the State of _____ are held and firmly bound unto the Green River Valley Water District (hereinafter called the Owner), in the full and just sum of _____ Dollars ($_____)

good and lawful money of the United States of America, to be paid upon demand of the Owner, to which payment well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, and assigns, jointly and severally and firmly by these presents.

WHEREAS, the Principal is about to submit or has submitted to the Owner, a proposal for furnishing all labor, materials, equipment and incidentals necessary to furnish and install the State Route 1846 1.0 MG Water Storage Reservoir.

WHEREAS, the Principal desires to file this bond in accordance with law, in lieu of a certified bidder's check otherwise required to accompany this Proposal.

NOW, THEREFORE: The conditions of this obligation are such that if the Proposal be accepted, the Principal shall, within fifteen days after the date of receipt of a written notice of award of contract, execute a contract in accordance with the Proposal and upon the terms, conditions and price(s) set forth therein, of the form and manner required by the Owner, and execute a sufficient and satisfactory contract performance bond payable to the Owner, in an amount of One Hundred Percent (100%) of the total Contract price in form and with security satisfactory to said Owner, then this obligation to be void; otherwise to be and remain in full force and virtue in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid Owner, upon demand, the amount hereof in good and lawful money of the United States of America.

IN TESTIMONY THEREOF, the Principal and Surety have caused these presents to be duly signed and sealed this _____ day of _____, 200__.

_____
Principal

BY_____
(Seal)

_____
Surety

_____
(Seal)

Countersigned _____

Local Resident Producing Agent for _____

NON-COLLUSION AFFIDAVIT

Each Contractor submitting a bid must fill out the following Affidavit:

STATE OF _____)
)ss
COUNTY OF _____)

Affiant, _____,

makes oath that he is the _____ of

the _____; and that the only parties directly or indirectly interested in this Contract are named herein; and that neither the Mayor, Alderman, Commissioner or any other City Official is directly or indirectly interested in this Contract or the proceeds thereof; and that the undersigned affiant has not given or donated or promised to give or donate directly or indirectly to any official or employee of the Green River Valley Water District or to anyone else for his benefit any sum of money or other thing of value for aid or assistance in obtaining this Contract.

Signed: _____

Subscribed and sworn to before me this

_____ day of _____, 200__.

_____

LIST OF SUBCONTRACTORS

PROJECT : STATE ROUTE 1846 1.0 MG WATER STORAGE RESERVOIR

The undersigned states that the following is a full and complete list of the proposed subcontractors on this Project and the class of work to be performed by each, and that such list will not be added to nor altered without written consent of the Owner.

Subcontractor and Address	Class of Work to be Performed
(1)	
(2)	
(3)	
(4)	
(5)	
(6)	
(7)	

Dated _____

_____
Bidder

By _____

STATEMENT OF EXPERIENCE OF BIDDER

The bidder is requested to state below that work of similar magnitude in order to judge his experience, skill and business standing and his ability to conduct the work as completely and as rapidly as required under the terms of the Contract.

Project and Location	Reference
(1) _____	_____
_____	_____
(2) _____	_____
_____	_____
(3) _____	_____
_____	_____
(4) _____	_____
_____	_____
(5) _____	_____
_____	_____
(6) _____	_____
_____	_____
(7) _____	_____
_____	_____

Dated _____

_____
Bidder

By _____

STATEMENT OF EXPERIENCE OF BIDDER

The bidder is requested to state below that work of similar magnitude in order to judge his experience, skill and business standing and his ability to conduct the work as completely and as rapidly as required under the terms of the Contract.

Project and Location	Reference
(1) _____	_____
_____	_____
(2) _____	_____
_____	_____
(3) _____	_____
_____	_____
(4) _____	_____
_____	_____
(5) _____	_____
_____	_____
(6) _____	_____
_____	_____
(7) _____	_____
_____	_____

Dated _____

_____
Bidder

By _____

STATEMENT OF EXPERIENCE OF BIDDER

The bidder is requested to state below that work of similar magnitude in order to judge his experience, skill and business standing and his ability to conduct the work as completely and as rapidly as required under the terms of the Contract.

Project and Location	Reference
(1) _____	_____
_____	_____
(2) _____	_____
_____	_____
(3) _____	_____
_____	_____
(4) _____	_____
_____	_____
(5) _____	_____
_____	_____
(6) _____	_____
_____	_____
(7) _____	_____
_____	_____

Dated _____

_____
Bidder

By _____

GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

STATE ROUTE 1846
1.0 MG WATER STORAGE RESERVOIR

SPECIAL CONDITIONS OF CONTRACT

TABLE OF CONTENTS

SPECIAL CONDITIONS OF CONTRACT

1. Construction Operations and Material Storage

The Contractor must carry on all his construction operations, including storage of materials, in such a way as to interfere as little as possible with the operation and maintenance of existing water or wastewater treatment facilities.

2. Soil Erosion and Sediment Control

2.1 The Contractor shall plan and control his construction operations to minimize all soil erosion and the siltation of drains and streams resulting from such erosion. All methods used for such control shall be approved by the Engineer.

2.2 The Contractor's attention is directed to Division G, Section 3 (Construction) - "Slope Protection and Erosion Control." This provision will be required on this project. All work shall be performed in full compliance with requirements of the Commonwealth of Kentucky - Division of Natural Resources. The Contractor shall provide and use all measures necessary to comply with State regulations. No separate payment will be made for this work.

2.3 Where the Contractor's operations subject soil to erosion by the wind, he shall control such erosion by approved methods until affected areas can be seeded and mulched.

2.4 The Contractor's attention is directed to the requirement for executing a Notice of Intent (NOI) for storm water discharges upon award of this project, which is included in this Section and must be executed by the Contractor after award of project. The Owner will pay required fee and transmit the NOI package to the State for review and approval. This NOI must be approved by the Kentucky Division of Water prior to beginning work on this project.

It shall be the responsibility of the Contractor to fully comply with all requirements and regulations of the NOI, storm water discharge regulations, and all other requirements contained herein.

3. Project Sign

3.1 The Contractor shall furnish and erect one sign at an appropriate place on the project site as approved by the Engineer. The Contractor shall be responsible for protecting and maintaining the sign in good condition throughout the life of the project.

3.2 The sign will be fabricated of good quality 1-inch exterior plywood with suitable frames and posts. A 4-inch x 1¼-inch molding strip shall be placed around the outer edge projecting over the face of the sign. The entire woodwork shall be given a prime coat and final coats of high-grade sign enamel. The sign shall be not less than 4 feet by 8 feet and shall contain, at a minimum, the name of the Owner and its Officials, Project Name and Number, Contractor and Engineer. Layout of the sign shall be approved by the Engineer before painting. Lettering shall be done by a professional painter.

4. Contract Drawings

The Drawings applicable to the work to be performed under this Contract are referred to in this document as Contract Drawings and described as follows:

GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

STATE ROUTE 1846
1.0 MG WATER STORAGE RESERVOIR

The sheet index and titles of all drawings appear on the index sheet of the Contract Drawings.

5. Arrangement and Charge for Water and Electrical Power

Where the Contractor desires a water and electrical power supply in connection with any construction work, he shall make complete and satisfactory arrangements with the Green River Valley Water District.

Payments shall be made by the Contractor in accordance with the Utility Agency's official rates and policies.

6. Use of Fire Hydrants

The Contractor shall not open, turn on, or make any connection to any hydrant unless prior written permission of the Green River Valley Water District or local utility is obtained.

7. Barricades and Warning Signs

The Contractor shall furnish, erect and maintain such barricades, fences, lights and danger signals, and take such other precautionary measures that will ensure the protection of persons, property and the work.

Traffic control devices shall meet the requirements of the "Manual of Uniformed Traffic Control Devices" (MUTCD).

Special Requirements may be required by Commonwealth of Kentucky concerning tunnel/bore crossings and the other work near the State or U.S. Highways on this project. The Contractor shall comply with these requirements.

8. Use of Explosives

Should the Contractor elect to use explosives in the prosecution of the work, and if permitted in this Contract, the Contractor shall employ only workmen familiar and skilled in the use of explosives, carefully cover the explosion with suitable timber, matting and/or excavation, and exercise the utmost care so as not to endanger life or property.

The Contractor shall obtain all necessary permits and/or licenses and carry on such work in compliance with all local Ordinances and Commonwealth of Kentucky Laws.

Whenever explosives are stored or kept they shall be stored in a safe and secure manner and all storage places shall be plainly marked "DANGEROUS -- EXPLOSIVES."

9. Restoration of Disturbed Areas

The Contractor shall be required to restore all areas disturbed by his operation to a condition equal to or better than the condition prevailing prior to construction.

10. Vegetation Damage

Reasonable care shall be taken during construction to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage.

Trees which receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing.

11. Coordination of Work

The Owner may award other separate contracts in connection with this project requiring work on or near the project site and may progress simultaneously with the work relating to the construction under this Contract. It is, therefore, a requirement that each contractor, including the Contractor for this Contract, coordinate his operations with those of other contractors, especially where connections must be made between contracts.

12. Sequence of Operations

The work designated to be performed under this Contract shall be coordinated in such manner that there shall be a minimum of interference with traffic and existing utilities. Existing water, gas, electric and communications shall not be interrupted without prior arrangements having been made with the management of the utility involved.

Backfilling and clean-up work shall be continuously prosecuted to the point that satisfactory ingress and egress to roadways can be maintained.

During the period required for construction under this Contract, it will be necessary that any existing wastewater treatment facilities, sanitary sewers, force mains, and pumping stations, be maintained in operation. The Contractor shall prepare and submit to the Owner and the Engineer a schedule of operations for approval. The Contractor shall dispose of all storm water and sewage accumulated in a manner acceptable to the Engineer.

13. Time for Completion and Liquidated Damages

The successful bidder shall commence work within 15 calendar days from and after the issuance by the Owner of a Written Notice to Proceed and shall complete all work in accordance with the terms and conditions of the Contract Documents within 240 consecutive calendar days from and after the date of the Notice to Proceed. The Notice to Proceed will be issued within 10 days after award of the Contract.

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

The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will ensure full completion thereof within the time specified. It is expressly understood and agreed by and between the Contractor and the Owner

that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality. If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay to the Owner the amount specified in the Agreement, not a penalty but as liquidated damages for breach of Contract, as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the work.

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

Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

a. To any preference, priority or allocation order duly issued by the government;

b. To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a Contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight, embargoes, and unusually severe weather; and

c. To any delays of subcontractors or suppliers occasioned by any of the causes specific in subsections a and b of this article.

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

14. Maintenance and Access of Traffic

Portions of the work are located in developed areas requiring the access for fire and other departments to be provided for, and at least one free lane shall be available for all traffic. Contractors are to arrange operations in these areas to meet these requirements and secure approval of operating procedures from the city, county road commission, or Kentucky Department of Highways, as the case may be.

15. Pavement Restoration

Where water lines are constructed under paved roadway surfaces within public rights-of-way, the Contractor will restore the asphalt or crushed stone pavement and/or shoulders between shoulder lines. It shall be the responsibility of the Contractor, upon completion of the water line installation, to regrade the street with pug mix to the template that existed prior to construction. This regrading shall be satisfactory to city or county road commission before the street is released for paving operations.

The Contractor shall further be responsible for the maintenance of disturbed streets until repaving operations have been initiated.

The Contractor shall be responsible for adjusting castings and valve boxes to the final pavement elevations.

The Contractor shall restore all curbs, gutters, sidewalks, ramps and private driveways or parking lots. Compensation for this work is detailed in other portions of this Document and any item, which must be removed as was evidenced and necessary for the installation of the proposed water lines for which there is no specific pay item(s), shall be considered as incidental to the construction of the proposed sewer and, therefore, no additional compensation will be allowed for the restoration of this (these) item(s).

The Contractor shall also be required to restore, at his own expense, all pavements disturbed by his operations where the water line was not constructed under the pavements disturbed in the correction of water deficiencies discovered after restorations have been completed.

16. Work in Easements

Portions of the work to be constructed under this Contract lie within easements on private property. Work performed in such easements shall be subject to the provisions of said easements which may be found in the office of the Green River Valley Water District. In general, these Easement Agreements provide for restoring the property to the condition existing before construction began.

Unless indicated otherwise, these easement widths are as follows:

Permanent Easement - 20 feet.

17. Property Damage Claims

Any and all property damage claims received by the Owner, their agents, or the Contractor resulting from any alleged operation of the Contractor shall be investigated promptly (within 14 days) by the Contractor or insurance carrier. Any such claims made to the Owner shall be forwarded to the Contractor in writing and the Contractor shall subsequently forward such claims to his insurance carrier. Before final payment is made by the Owner to the Contractor, a summary of the Contractor's disposition of all such claims shall be provided to the Owner. Nothing contained in this paragraph shall be interpreted by the Contractor to lessen the requirements of the General Conditions and, in particular, Paragraph 3.16 of the General Conditions entitled "Responsibility for Damage."

18. Supervision and Emergency Procedures

The Contractor shall man this project with adequate and qualified foremen and superintendents at all times. During weekends and night time hours, the Contractor shall have someone who can be on call (with names and telephone numbers) to be furnished to the Engineer and the Green River Valley Water District for emergency measures such as backfilling open holes, placing of barricades, and correction of other potential problems and/or hazards. During regular working hours, the Contractor should arrange for a local office and someone to receive phone calls and instructions and/or questions.

19. Work in City and State Road Rights-of-Way

When ordered by the Engineer or Owner's Representative, the Contractor shall place temporary cold mix in street trench cuts. This temporary pavement shall be properly maintained by the Contractor until such time as final pavement restoration is completed.

At various locations on this project (in addition to what might be specifically shown on the Contract Drawings), the nature of construction and traffic conditions will require that the Contractor utilize and maintain heavy steel plates to facilitate traffic. These steel plates shall be of sufficient size and thickness to be utilized for varying trenching conditions.

The Contractor shall make every possible effort to backfill all excavations at the end of each day's construction operations. To accomplish this procedure, the Contractor shall mark and/or reference the end of the pipe each day for reopening trench the next morning. In some cases the use of "sand or gravel bags" will facilitate this procedure, especially where major roads or highways must be crossed one lane at a time.

The Contractor shall remove equipment and other materials from and near the street or highway at the end of each day's construction operations. See previous provisions concerning barricades and warning signs.

All costs associated with furnishing, placing, maintaining and using these steel plates shall be merged into the Contractor's unit price bid for water mains□□.

20. Repair of Existing Water Mains and Services

Should the Contractor through his construction operations break or otherwise damage an existing water service or water main, the Contractor may undertake to make the necessary repairs as long as the following conditions are met:

A. Notify the local Utility of the damage and coordinate with the Board on the operation of any valves.

B. Complete the repair in compliance with requirements of the local Utility.

C. Furnish and install materials, fittings and sleeves in compliance with the standards of the local Utilities Board.

D. Store and have available on the project proper materials of sizes and type needed to avoid unnecessary repair delays.

Any repairs which are completed by the forces of the local Utility shall be billed to the Contractor based on the Utilities Standard invoicing procedures.

21. Deletions by Owner

Portions or segments of this work may be deleted by the Owner at their discretion during the course of construction operations because of funding considerations and/or unforeseen or unknown difficult construction conditions which may arise during the course of the work which this Contract does not cover.

22. Funding

The bidder's attention is directed to the fact that this project is being funded from KIA Grant #WX21099004. Therefore, each bidder should review and be aware of the provisions and requirements with certain Federal Laws and Regulations as set forth. These shall include but are not limited to the following areas:

A. Equal Opportunity and Affirmative Action

23. Prevailing Wage Determination

The Contractor shall be required to fully comply with the current Prevailing Wage Determination **No. CR 5-05**, dated January 7, 2009 for Hart County. This wage determination and all work on this project has been designated **Project No. 050-H-00047-09-5** Heavy/Highway Project as indicated on the pages included with this section.

24. Construction Activities and Compliance with Crossing Permits By Kentucky Transportation Cabinet's Department of Highways, and Other Agencies Involved

The Contractor shall plan and control his construction activities to minimize all soil erosion and siltation of drains and streams. In addition, the Contractor shall comply with all requirements of the Kentucky Transportation Cabinet's Department of Highways and all other agencies.

Enclosed herewith and made a requirement of this Contract are crossing permits and approvals from the various agencies involved. The Contractor shall review the following data or specific data obtained from the agency and comply with all conditions.

25. Subsurface Soil Investigation

A subsurface soil investigation will be required by the Tank Contractor to determine the soils bearing pressure for the design of the foundation. A minimum of three (3) borings should be drilled with one at the tank center and two (2) at 180 degrees apart on the foundation circle diameter at a depth of 30 feet. The report will be written on the results of the test, and this will form the basis of the design. The investigation shall be completed by a qualified and independent geotechnical engineer. All cost required for the subsurface investigation and report shall be the responsibility of the contractor.

26. Supplemental Unit Price Foundation Items Ordered by the Engineer

Water main, valve pit structures, and water storage foundations as set forth in the requirements for excavation and backfill in some cases might encounter unsuitable foundation material requiring additional foundation work. The following items were established for that purpose.

Measurement for payment and compensation for supplemental foundation unit price items ordered by the Engineer will be as stated in the Proposal. All other items of work under this Section shall be included in the lump sum item.

1. Supplemental Rock Excavation

   Compensation for supplemental rock excavation ordered removed will be based upon the Contract unit price multiplied by the measured cubic yards, or fraction thereof, removed. For payment, the limit of rock excavation shall be a line 3 feet outside the wall or 12 inches outside the footing, whichever is greater. The depth of rock excavation under this item shall be to the depth directed by the Engineer. Rock shall include any material which, in the opinion of the Engineer, must be removed by blasting or by percussion drilling.

   Compensation shall include payment for all costs including, but not limited to, removing and disposing of the excavated material, wet or dry, and all other costs related to the excavation including any required dewatering.

2. Test Drilling

   Compensation for test drilling will be based upon the Contract unit price multiplied by the actual linear feet drilled. Compensation shall include payment for all costs including, but

not limited to, labor, materials, equipment and other considerations necessary to set up and drill test holes.

3. Granular Foundation Material (refill, imported backfill / bedding material)

Compensation for granular foundation material ordered placed (except that placed in rock excavation) will be based upon the Contract unit price multiplied by the actual tonnage or cubic yards placed until the total quantity ordered placed since the start of construction under this Contract becomes 115 percent of the quantity stated in the Agreement. Compensation for granular foundation material in excess of 115 percent of the quantity stated in the Agreement will be made through a Change Order as provided for in the General Conditions.

Measurement and payment for pipelines shall be based on the formula (4/3 O.D. + 24)/12) (length (ft)) (depth (ft)) divided by 27.

4. Supplemental Dirt Excavation and/or Unclassified Excavation for Undercuts to Remove Unstable Material

Compensation for supplemental dirt excavation ordered removed will be based on the Contract unit price multiplied by the measured cubic yards or fraction thereof removed. For payment, the limit of dirt excavation shall be a line 3 feet outside the wall or 12 inches outside the footing, whichever is greater. The depth of the dirt excavation under this item shall be to the depth directed by the Engineer.

Measurement and payment for pipelines shall be based on the formula (4/3 O.D. + 24)/12) (length (ft)) (depth (ft)) divided by 27.

Compensation shall include payment for all costs including, but not limited to, removing and disposing of the excavated material, wet or dry, and all other costs related to the excavation including any required dewatering.

5. Class C Concrete

Compensation for Class C concrete, when ordered in writing by the Engineer for refill will be based upon the Contract unit price multiplied by the actual cubic yards placed until the total quantity placed since the start of construction under this Contract becomes 115 percent of the quantity stated in the Agreement. Compensation for Class C concrete in excess of 115 percent of the quantity stated in the Agreement will be made through a Change Order as provided for in the General Conditions.

Steven L. Beshear
Governor

Daniel Mongiardo
Lieutenant Governor

KENTUCKY LABOR CABINET
DEPARTMENT OF WORKPLACE STANDARDS
DIVISION OF EMPLOYMENT STANDARDS, APPRENTICESHIP & MEDIATION
1047 US Hwy 127 S - Suite 4
Frankfort, Kentucky 40601
Phone: (502) 564-3534
Fax (502) 564-2248
www.labor.ky.gov

J. R. Gray
Secretary

Mark S. Brown
Deputy Secretary

Michael L. Dixon
Commissioner

May 5, 2009

Tim Graves
Water Management Services
POB 17650
Nashville TN 37217

Re: Green River Valley Water District, 1.0 MG Water Storage Reservoir

Advertising Date as Shown on Notification: May 7, 2009

Dear Tim Graves:

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

I am enclosing a copy of the current prevailing wage determination number CR 5-05, dated January 7, 2009 for HART County. This schedule of wages shall be attached to and made a part of the specifications for the work, printed on the bidding blanks, and made a part of the contract for the construction of the public works between the public authority and the successful bidder or bidders.

The determination number assigned to this project is based upon the advertising date contained in your notification. There may be modifications to this wage determination prior to the advertising date indicated. In addition, if the contract is not awarded within 90 days of this advertising date or if the advertising date is modified, a different set of prevailing rates of wages may be applicable. It will be the responsibility of the public authority to contact this office and verify the correct schedule of the prevailing rates of wages for use on the project. Your project number is as follows: 050-H-00047-09-5, Heavy/Highway

Sincerely,

Michael L. Dixon
Commissioner

ERRATUM

Refer to the Locality Number and Determination Number listed below published by the Kentucky Labor Cabinet, Division of Employment Standards on January 7, 2009.

Locality No. 005

Determination No. CR-5-005

DELETE:

PLASTERERS:	BASE RATE	$11.81
	FRINGE BENEFITS	1.59

Michael L. Dixon, Commissioner
Kentucky Labor Cabinet
Division of Employment Standards

This 19th day of February, 2009.

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

Determination No. CR-5-00

Project No. 050-H-00047-09-5
Type: ___ **Bldg** _xx___ **HH**

Date of Determination: January 7, 2009

This schedule of the prevailing rate of wages for Locality No. 005, which includes Breckinridge, Grayson, Hancock, Hart, Larue, and Meade Counties, has been determined in accordance with the provisions of KRS 337.505 to 337.550. This determination shall be referred to as Prevailing Wage Determination No. CR-5-005.

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

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

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

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

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

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

BUILDING CONSTRUCTION

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

HIGHWAY CONSTRUCTION

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

HEAVY CONSTRUCTION

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

Michael L. Dixon
Commissioner
KENTUCKY LABOR CABINET

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
ASBESTOS/INSULATION WORKERS:		BASE RATE FRINGE BENEFITS	$24.41 9.81
BOILERMAKERS:		BASE RATE FRINGE BENEFITS	$31.29 15.91
BRICKLAYERS:			
Bricklayers		BASE RATE FRINGE BENEFITS	$22.93 9.18
Refractory		BASE RATE FRINGE BENEFITS	$23.43 9.10
CARPENTERS:			
Carpenters	BUILDING	*BASE RATE FRINGE BENEFITS	$21.56 11.08
Piledrivermen	BUILDING	BASE RATE FRINGE BENEFITS	$20.52 9.01

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

Carpenters	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$20.70 5.68
Piledrivermen	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$20.95 5.68
Divers	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$31.43 5.68
CEMENT MASONS:		BASE RATE	$13.14

CLASSIFICATIONS	RATE AND FRINGE BENEFITS	
ELECTRICIANS:	BASE RATE	$26.66
	FRINGE BENEFITS	12.84
ELEVATOR CONSTRUCTORS:	BASE RATE	$20.725
	FRINGE BENEFITS	6.12
GLAZIERS:	*BASE RATE	$18.41
	FRINGE BENEFITS	3.88

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

IRONWORKERS:	BASE RATE	$24.75
	FRINGE BENEFITS	14.74

LABORERS:

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

BUILDING	BASE RATE	$19.50
	FRINGE BENEFITS	9.03

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

BUILDING	BASE RATE	$19.70
	FRINGE BENEFITS	9.03

CLASSIFICATIONS — RATE AND FRINGE BENEFITS

LABORERS: (Continued)

Group 3

Powderman or Blasters:	BUILDING	BASE RATE	$18.57
		FRINGE BENEFITS	8.79

LABORERS: HEAVY & HIGHWAY

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

HEAVY & HIGHWAY	BASE RATE	$19.88
	FRINGE BENEFITS	8.63

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

HEAVY & HIGHWAY	BASE RATE	$20.13
	FRINGE BENEFITS	8.63

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

CLASSIFICATIONS — RATE AND FRINGE BENEFITS

LABORERS: HEAVY & HIGHWAY (Continued)

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

HEAVY & HIGHWAY	BASE RATE	$20.78
	FRINGE BENEFITS	8.63

MARBLE, TILE & TERRAZZO SETTERS:	BASE RATE	$21.99
	FRINGE BENEFITS	5.30
MARBLE, TILE & TERRAZZO FINISHERS:	BASE RATE	$15.24
	FRINGE BENEFITS	4.55

MILLWRIGHTS:	BASE RATE	$22.43
	FRINGE BENEFITS	13.31

OPERATING ENGINEERS:

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

BUILDING	*BASE RATE	$22.85
	FRINGE BENEFITS	12.40

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

CLASSIFICATIONS RATE AND FRINGE BENEFITS

OPERATING ENGINEERS: *(Building Continued)*

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

BUILDING	BASE RATE	$19.36
	FRINGE BENEFITS1	12.40

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

BUILDING	BASE RATE	$17.84
	FRINGE BENEFITS	12.40

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

HEAVY & HIGHWAY	**BASE RATE	$23.60
	FRINGE BENEFITS	12.40

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

CLASSIFICATIONS — RATE AND FRINGE BENEFITS

OPERATING ENGINEERS: (Heavy & Highway Continued)

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

HEAVY & HIGHWAY	BASE RATE	$21.18
	FRINGE BENEFITS	12.40

Greaser on Grease Facilities servicing Heavy Equipment.

HEAVY & HIGHWAY	BASE RATE	$21.56
	FRINGE BENEFITS	12.40

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

HEAVY & HIGHWAY	BASE RATE	$20.92
	FRINGE BENEFITS	12.40

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

PAINTERS:

Brush, Roller & Paperhangers	BUILDING	*BASE RATE	$20.00
		FRINGE BENEFITS	6.28
Drywall Finishers & Plasterers	BUILDING	*BASE RATE	$20.25
		FRINGE BENEFITS	6.28

Spray, Sandblast, Power Tools, Waterblast, Steam Cleaning, Brush & Roller of Mastics, Creosotes, Kwinch Koate and Coal Tar Epoxy

BUILDING	*BASE RATE	$21.00
	FRINGE BENEFITS	6.28

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
PAINTERS: (Building Continued)			
Spray of Mastics, Creosotes, Kwinch Koate and Coal Tar Epoxy	BUILDING	*BASE RATE	$22.00
		FRINGE BENEFITS	6.28

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

Brush, Roller & Paperhangers	HEAVY & HIGHWAY	BASE RATE	$19.15
		FRINGE BENEFITS	4.88
Drywall Finishers & Plasterers	HEAVY & HIGHWAY	BASE RATE	$19.40
		FRINGE BENEFITS	4.88
Spray, Sandblast, Power Tools, Waterblast, Steam Cleaning, Brush & Roller of Mastics, Creosotes, Kwinch Koate and Coal Tar Epoxy			
	HEAVY & HIGHWAY	BASE RATE	$20.15
		FRINGE BENEFITS	4.88
Spray of Mastics, Creosotes, Kwinch Koate and Coal Tar Epoxy			
	HEAVY & HIGHWAY	BASE RATE	$21.15
		FRINGE BENEFITS	4.88
PLASTERERS:		BASE RATE	$11.81
		FRINGE BENEFITS	1.59
PLUMBERS & PIPEFITTERS:		BASE RATE	$29.00
		FRINGE BENEFITS	12.98
ROOFERS: (Excluding Metal Roofs)		BASE RATE	$16.90
		FRINGE BENEFITS	4.95
SHEETMETAL WORKERS: (Including Metal Roofs)		BASE RATE	$28.40
		FRINGE BENEFITS	11.52

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
SPRINKLER FITTERS:		BASE RATE	$27.05
		FRINGE BENEFITS	12.90

TEAMSTERS/TRUCK DRIVERS:

Truck Helper and Warehouseman	BUILDING	BASE RATE	$10.06
		*FRINGE BENEFITS	1.33
Driver - 3 tons and under, Greaser, Tire Changer and Mechanic Helper	BUILDING	BASE RATE	$10.18
		*FRINGE BENEFITS	1.33
Driver - over 3 tons, Drivers, Semi-Trailer or Pole Trailer; Dump Trucks, Tandem Axle; Farm Tractor when used to pull building material or equipment	BUILDING	BASE RATE	$10.29
		*FRINGE BENEFITS	1.33
Drivers, Concrete Mixer Trucks (all types, hauling on job sites only); Truck Mechanics	BUILDING	BASE RATE	$10.36
		*FRINGE BENEFITS	1.33
Drivers, Euclid and other Heavy Earth Moving Equipment and Low Boy, Winch Truck and A-Frame Truck and Monorail Truck when used to transport building materials, Forklift Truck when used inside warehouse or storage area.	BUILDING	BASE RATE	$10.46
		*FRINGE BENEFITS	1.33

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

Truck helper and warehouseman, mobile batch truck helper.	HEAVY & HIGHWAY	BASE RATE	$17.78
		**FRINGE BENEFITS	2.28
Greaser, tire changer and mechanic helper.	HEAVY & HIGHWAY	BASE RATE	$17.83
		**FRINGE BENEFITS	2.28
Truck mechanic	HEAVY & HIGHWAY	BASE RATE	$18.06
		**FRINGE BENEFITS	2.28

CLASSIFICATIONS RATE AND FRINGE BENEFITS

TEAMSTERS/TRUCK DRIVERS: (Continued)

Driver-single axle dump and flatbed truck, semi-trailer or pole trailer when used to pull building materials and equipment, tandem axle dump truck, driver of distributors, driver on mixer trucks (all types).

HEAVY & HIGHWAY	BASE RATE	$18.13
	**FRINGE BENEFITS	2.28

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

HEAVY & HIGHWAY	BASE RATE	$18.14
	**FRINGE BENEFITS	2.28

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

END OF DOCUMENT CR-5-005
January 7, 2009
Page 11 of 11

TRANSPORTATION CABINET

Steven L. Beshear
Governor

Department of Highways District 4 Office
634 East Dixie
P.O. Box 309
Elizabethtown, KY 42702
(270) 766-5066

Joseph W. Prather
Secretary

April 2, 2009

DAVID PAIGE
GREEN RIVER VALLEY WATER DISTRICT
P.O. BOX 399
CAVE CITY,KY 42127

SUBJECT: Hart County, RS-50-1846-.95
KY 1846 (OLD GLASGOW RD.)
Permit Number 04-0076-09

Dear MR. DAVID PAIGE:

Your application for an encroachment permit has been approved by the Department of Highways. We are returning two copies of the approved permit so one may be kept in your record files. The other copy must be given to the party responsible for completing the project and must be kept at the jobsite at all times.

Please see that the work is done in strict conformity with the permit and any other applicable conditions (See Form TC99-21 and any other attached documents, conditions or specifications). The work should be completed no later than January 1, 2010. When the permitted work and any necessary restoration have been completed please notify this office by using the attached form which will serve as notification for final inspection.

If there are any questions regarding this permit, please do not hesitate to contact Charles Allen, Permits Engineer at 270-766-5066 or fax number 270-766-5069.

Sincerely,

Charles A. Allen

For, Patty Dunaway
Chief District Engineer
Department of Highways
District 4 -Elizabethtown
Post Office Box 309
Elizabethtown, KY 42702-0309

TRANSPORTATION CABINET

Steven L. Beshear
Governor

Department of Highways District 4 Office
634 East Dixie
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Elizabethtown, KY 42702
(270) 766-5066

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Please see that the work is done in strict conformity with the permit and any other applicable conditions (See Form TC99-21 and any other attached documents, conditions or specifications). The work should be completed no later than January 1, 2010. When the permitted work and any necessary restoration have been completed please notify this office by using the attached form which will serve as notification for final inspection.

If there are any questions regarding this permit, please do not hesitate to contact Charles Allen, Permits Engineer at 270-766-5066 or fax number 270-766-5069.

Sincerely,

Charles A. Allen

For, Patty Dunaway
Chief District Engineer
Department of Highways
District 4 -Elizabethtown
Post Office Box 309
Elizabethtown, KY 42702-0309

NOTICE OF COMPLETION OF ENCROACHMENT PERMIT WORK

Please return this form to the District Office when work is completed and ready for final inspection.

Applicant Identification	Project Identification
Name: GREEN RIVER VALLEY WATER DISTRIC	Permit Number: 04-0076-09
Contact Person: MR. DAVID PAIGE	County: Hart
Address: P.O. BOX 399	Route Number: 1846
City: CAVE CITY	Road Name: OLD GLASGOW RD.
State: KY Zip: 42127	Milepoint: .95
Telephone: --	

I wish to notify the Department of Highways that the above mentioned permit work and any necessary right of way restoration have been completed and are ready for final inspection.

_____

Applicant

Please Return To: Department of Highways
District 4 Elizabethtown
Post Office Box 309
Elizabethtown, Ky. 42702-0309

Attention: Charles Allen, Permits Engineer

KENTUCKY TRANSPORTATION CABINET
Department of Highways
Permits Branch

Rev. 04/2008

Released Date _____

ENCROACHMENT PERMIT

PERMIT NO. 04-0076-09

APPLICANT IDENTIFICATION:

NAME: Green River Valley Water District
CONTACT PERSON: David Paige
ADDRESS: PO Box 399
CITY: Cave City
STATE: Kentucky ZIP CODE: 42127
PHONE: area code (270) 773-2135

PROJECT IDENTIFICATION:

ACCESS CONTROL: ☒ By Permit ☐ Partial ☐ Full
COUNTY: Hart PRIORITY ROUTE NO: 1846
MILEPOINT: 0.95 ☐ Left ☒ Right ☐ X-ing
PROJECT STATUS: ☒ Maint. ☐ Const. Design
PROJECT # STATE: RS 050 1846 000 -001
PROJECT # FEDERAL: _____
ROAD/STREET NAME: Old Glasgow Rd.

TYPE OF ENCROACHMENT:

☐ COMMERCIAL ENTRANCE - BUSINESS* _____
☐ PRIVATE ENTRANCE: ☐ Single Family ☐ Farm
☒ UTILITY: ☐ Overhead ☒ Underground
☐ GRADE: ☐ Fill ☐ Landscape on R/W
☐ AIRSPACE: ☐ Agreement ☐ Lease
☒ OTHER: (Specify)
Driveway entrance for proposed water tank

*Electronic PDF file required of final plans and specifications

TYPE OF INDEMNITY: ☒ Bond ☐ Cash
☐ SELF-INSURED AMOUNT ENCUMBERED $ 5500
☐ OTHER _____

NAME AND ADDRESS OF LOCAL INSURANCE AGENCY OR SELF-INSURED REPRESENTATIVE:

ATTACHMENTS:

☒ Standard Drawings (List on TC 99-21 under Misc.)
☒ Applicant's Plans
☐ Highway Plan and Profile Sheets
☐ TC 99-3 (Ponding Encroachment Specs. and Conditions)
☐ TC 99-4 (Rest Area Usage Specs. and Conditions)
☐ TC 99-5 (Tree Cutting/Trimming Specs. and Conditions)
☐ TC 99-6 (Chemical Use of Specs. and Conditions)
☐ TC 99-10 (Typical Highway Boring Crossing Detail)
☐ TC 99-12 (Overhead Utility Encroachment Diagram)
☐ TC 99-13 (Surface Restoration Methods)
☒ TC 99-21 (Encroachment Permit General Notes and Specs)
☐ TC 99-22 (Agreement for Services to be Performed)
☐ TC 99-23 (Mass Transit Shelter Specs. and Conditions)
☒ Other Attachments (Specify):
USGS Map
Letter of Request

RECD APR 02 2009 DEPT OF HIGHWAYS

INDEMNITY: *The applicant, in order to secure this obligation,* has deposited with the Transportation Cabinet as a guarantee of conformance with the Department's Encroachment Permit requirements, an indemnity in the amount of $ 5500 as determined by the Department. It shall be the responsibility of the applicant or permitee, *his heirs and assignees to keep all indemnities in full force until* construction or reconstruction has been completed and duly accepted by an authorized agent of the Transportation Cabinet, Department of Highways.

BRIEF DESCRIPTION OF WORK TO BE DONE.

Proposed access road for State Route 1846 water tank connecting to State Route 1846 at milepoint 0.95 at coordinates 37°09'42"N, 85°54'11"W.

Clear all sight obstruction & vegetation from R/W for a minimum 475LF from Entrance (CM) Speed Study & sight distance needed after clearing is complete

Applicant certifies project area ☐ does ☒ does not exceed one acre. Projects disturbing more than one acre require a KPDES KYR 10 permit.

IMPORTANT (PLEASE READ): Applicant ☐ does ☒ does not intend to apply for excess R/W.

When the work is completed in accordance with the terms of this encroachment permit, your indemnity will be released. However, the permit is effective until revoked by the Transportation Cabinet and the terms on the permit accompanying permit documents and drawings remain in effect as long as the encroachment exists. **FUTURE MAINTENANCE OF THE ENCROACHMENT IS THE RESPONSIBILITY OF THE PERMITEE.** It is important that you understand the requirements of this encroachment permit application and accompanying documents. If you have not done so, it is suggested that you review these documents and place the permit package in a safe place for future reference.

A copy of this permit and all documents shall be given to your contractor and shall be readily available at the work site for the encroachment permit inspector to review at all times. Failure to meet this requirement may result in cancellation of this permit.

IN THE EVENT THIS APPLICATION IS APPROVED, THIS DOCUMENT SHALL CONSTITUTE A PERMIT FOR THE APPLICANT TO USE THE RIGHT-OF-WAY, BUT ONLY IN THE MANNER AUTHORIZED BY THIS DOCUMENT AND REGULATIONS OF THE DEPARTMENT AND THE DRAWINGS, PLANS, ATTACHMENTS, AND OTHER PERTINENT DATA ATTACHED HERETO AND MADE A PART HEREOF.

ENCROACHMENT PERMIT GENERAL NOTES & SPECIFICATIONS

Permit No. _____

I. SAFETY

A. General Provisions

☒ All signs and control of traffic shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition, Part VI, and safety requirements shall comply with the Permits Manual.

☒ All work necessary in shoulder or ditch line areas of a state highway shall be scheduled to be promptly completed so that hazards adjacent to the traveled way are kept to an absolute minimum.

☒ No more than one (1) traveled-lane shall be blocked or obstructed during normal working hours. All signs and flaggers during lane closure shall conform to the Manual on Uniform Traffic Control Devices.

☒ When necessary to block one (1) traveled-lane of a state highway, the normal working hours shall be as directed by the Department. No lanes shall be blocked or obstructed during adverse weather conditions (rain, snow, fog, etc.) without specific permission from the Department. Working hours shall be between 9:00 am and 3:00 pm

☒ The traveled-way and shoulders shall be kept clear of mud and other construction debris at all times during construction of the permitted facility.

☒ No nonconstruction equipment or vehicles or office trailers shall be allowed on the right of way during working hours.

☒ The right of way shall be left free and clear of equipment, material, and vehicles during non-working hours.

B. Explosives

☒ No explosive devices or explosive material shall be used within state right of way without proper license and approval of the Kentucky Department of Mines and Minerals, Explosive Division.

C. Other Safety Requirements

☐

II. UTILITIES - Applies to Fully Controlled Access Highways ONLY

☐ *All work necessary within the right of way shall be performed behind a temporary fence erected prior to a boring operation.

☐ *The temporary woven wire fence shall be removed immediately upon completion of work on the right of way, and the control of access immediately restored to original condition, in accordance with applicable Kentucky Department of Highways Standard Drawings.

☐ *All vents, valves, manholes, etc., shall be located outside of the right-of-way.

☐ *Encasement pipe shall extend from right-of-way line to right-of-way line and shall be one continuous run of pipe. The encasement pipe shall be welded at all joints.

☐ The boring pit and tail ditch shall extend past the existing toe of slope or bottom of ditch line and shall be a minimum of 42 inches deep.

Permit No. _____

IV. RIGHT OF WAY RESTORATION

☒ All disturbed portions of the right of way shall be restored to grass as per Kentucky Department of Highways Standard Specifications for Road and Bridge Construction (latest edition). A satisfactory turf, as determined by the Department, shall be established by the permittee prior to release of indemnity. Sodding or seeding shall be as follows:

Lawn or High Maintenance Situation	70% Lawn Fescue (e.g., variety - Falcon) 30% Bluegrass **or** 70% Lawn Rye (e.g., variety - Derby) 30% Bluegrass
Right of Way Lawn Maintenance Situation	70% KY 31 Fescue 30% Perennial Rye Grass **or** 100% KY Fescue

☐ Two tons of clean straw mulch per acre of seeding.

☒ Prior to seeding, the ground shall be prepared in accordance with Kentucky Department of Highways Standard Specifications for Road and Bridge Construction (latest edition).

☐ Substitutes for sod such as artificial turf, rocked mulch, or paved areas may be acceptable if they are aesthetically pleasing.

☒ All ditch-flow lines and all ditch-side slopes shall be sodded.

☐ Existing concrete right of way markers shall not be disturbed, but if damaged in any way, they shall be entirely replaced by the permittee, with new concrete markers to match the original markers, in accordance with Kentucky Department of Highways Standard Drawings. Markers that are entirely removed shall be re-established in the proper locations by the permittee and to the satisfaction of the Department.

☐ *Other right of way restoration requirements are as follows:*

V. DRAINAGE

☒ All pipe shall be laid in a straight alignment, to proper grades, and with all materials and methods of installation including bedding and joint seating in accordance with Department Standard Specifications for Road and Bridge Construction (latest edition). Pipe shall not be covered until inspected by the Department and express permission obtained to make backfill.

☐ All gutter lines at the base of new curbs shall be on continuous grades, and pockets of water along with curbs or in entrance areas or other paved areas within the right of way shall not be acceptable.

☒ All drainage structures and appurtenances (manholes, catch basins, curbing, inlet basins, etc.) shall conform to Department specifications and shall be constructed in accordance with the Department Standard Drawings. Type required:

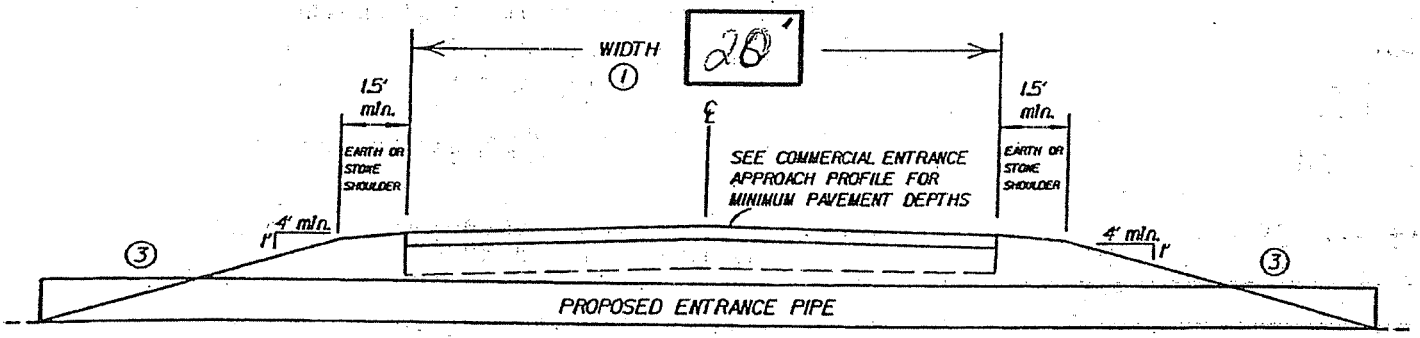
_____

_____

District 4
Rev.11/07

COMMERCIAL ENTRANCE

TYPICAL PIPE SECTION



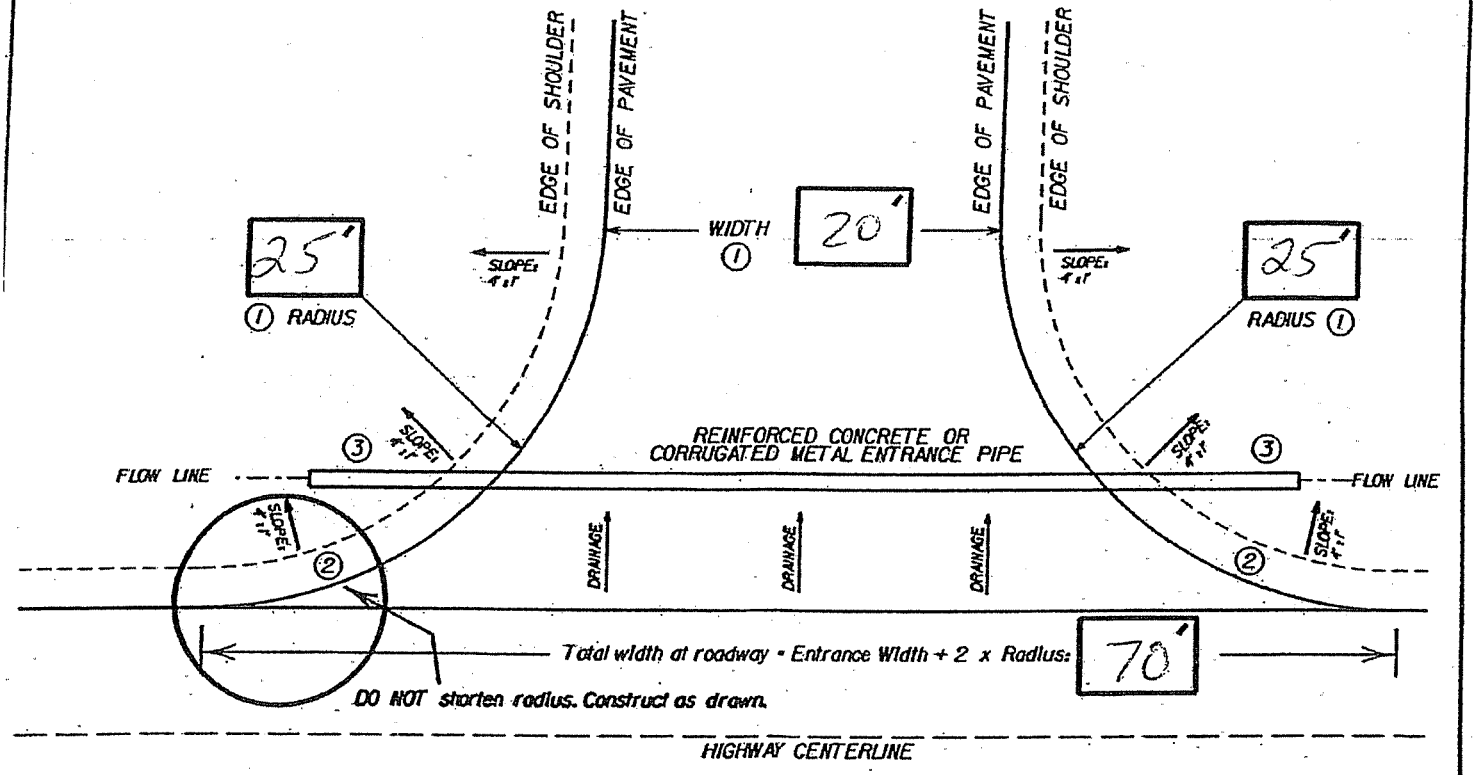
SPECIAL NOTES:

(1) Allowable entrance widths 20' - 50'. Allowable radii 25' - 50'. HOWEVER, entrance MUST BE constructed as drawn or have changes approved by KDOH.

(2) Entire radius must be correctly constructed before Indemnity will be released.

(3) Construct all side slopes to a 4' (Horz) by 1' (Vert) slope or flatter as shown above. Safety headwalls may be required on pipes greater than 18".

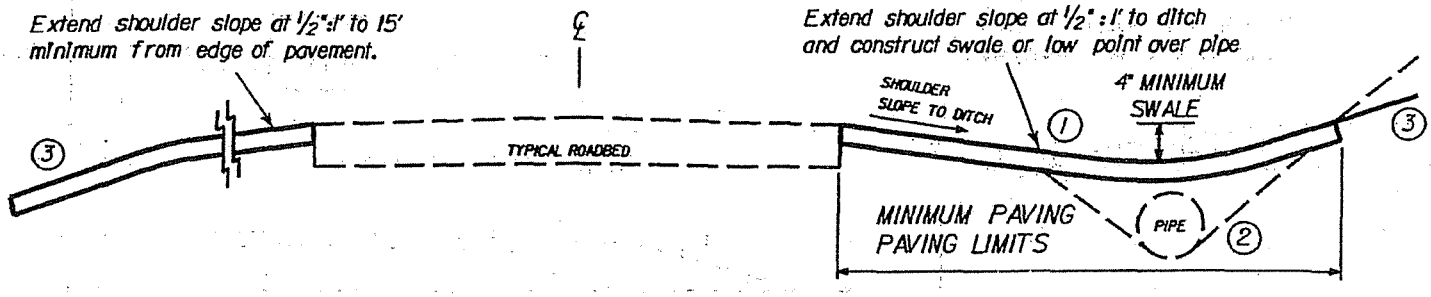
4. Dress and seed in accordance with KDOH standards.



COMMERCIAL ENTRANCE

APPROACH PROFILE

ROADWAY DRAINAGE DETAIL



COMMERCIAL ENTRANCE APPROACH

ALL COMMERCIAL ENTRANCES MUST BE PAVED FROM THE EDGE OF DRIVING LANE TO A POINT PAST THE DITCH LINE AS SHOWN USING THE MINIMUM PAVEMENT DEPTHS BELOW UNLESS OTHERWISE PERMITTED BY PERMITS ENGINEER.

-ASPHALT ENTRANCE APPROACH-

Surface Material:
1 1/4" Asphalt Surface CL 2 0.38D PG64-22
Base Material:
2 1/2" Asphalt Base CL 2 1.0D PG64-22
Subgrade Material:
6" Crushed Stone Base (preferred) or DGA

-- OR --

-CONCRETE ENTRANCE APPROACH-

Surface Material:
8" Portland Cement concrete, Class A, 3500 psi
Base Material:
4" Crushed Stone Base (preferred) or DGA

-- OR --

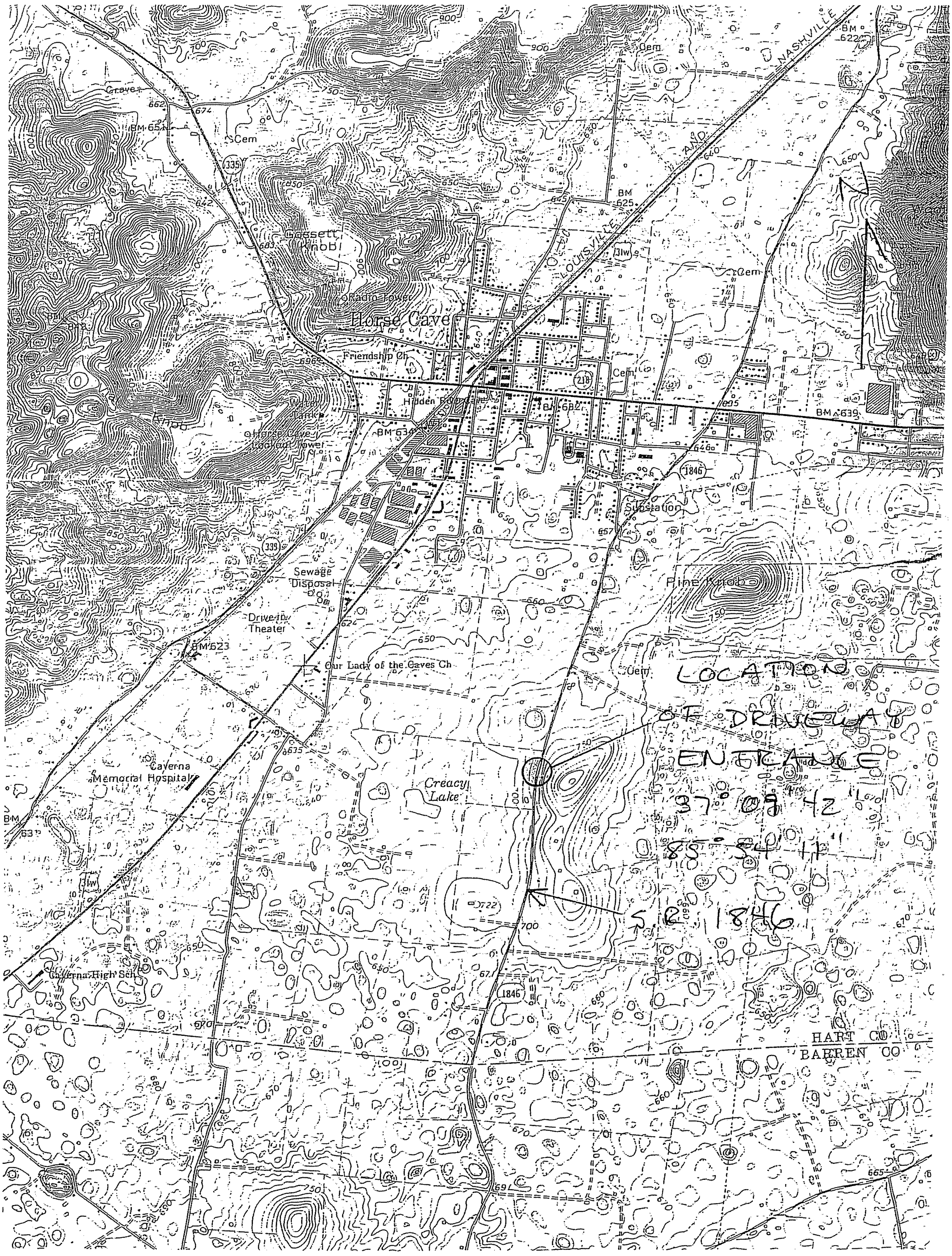
-MATCH EXISTING PAVEMENT-

Pavement to be equal to the pavement design of the roadway mainline.

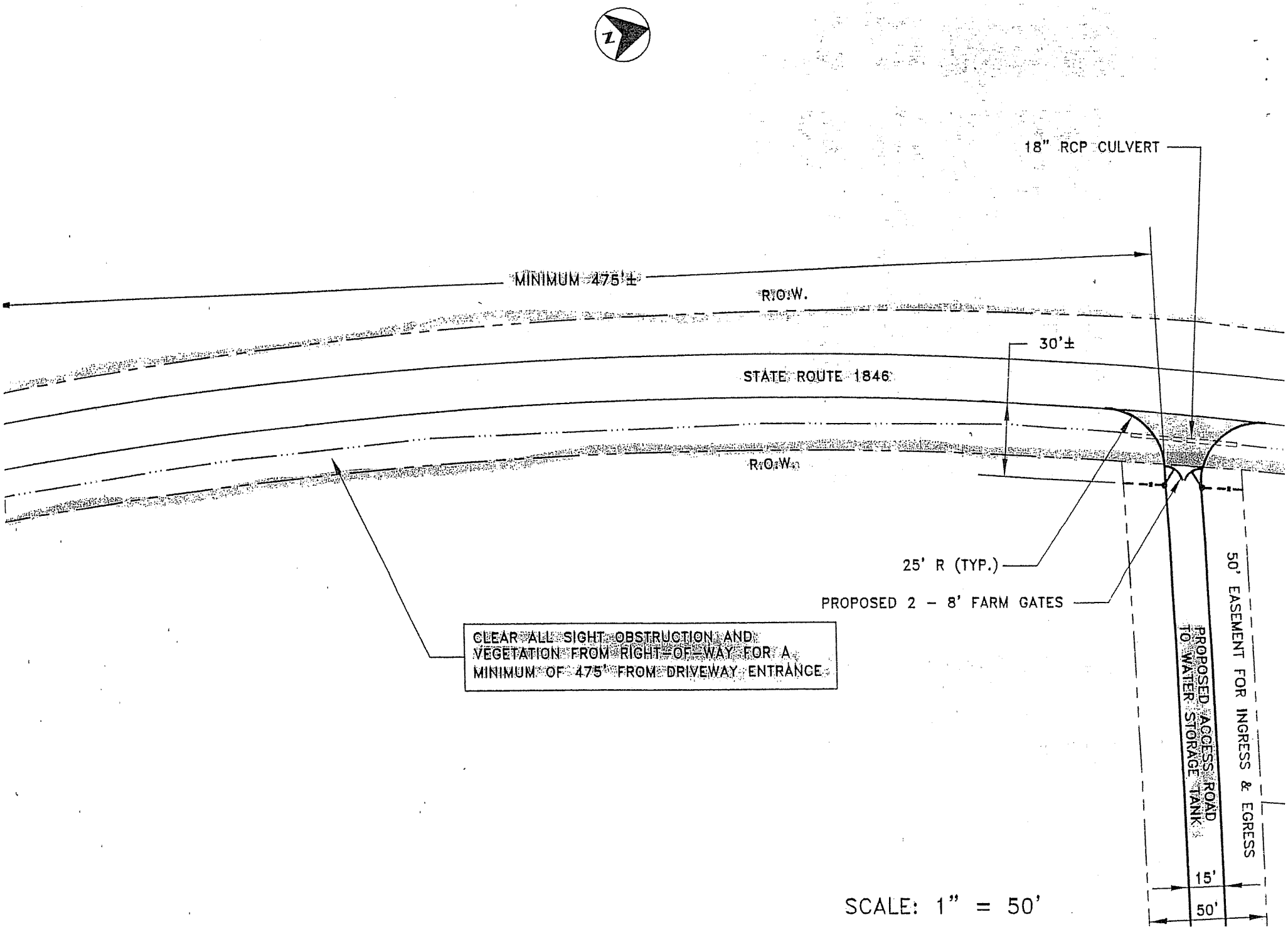
SPECIAL NOTES:

(1) Entrance should be constructed so that all runoff will drain away from roadway and is not allowed onto the shoulder or driving lane.
(2) Ditching or other excavation may be necessary to assure proper pipe coverage and provide positive drainage. Minimum ditch flowline slope is 1/2' per 100'.
(3) Maximum entrance slope 16% on right-of-way. Excavate where necessary to achieve this slope.
4. Use corrugated metal or concrete entrance pipe. No plastic pipe is allowed on highway right-of-way without prior approval.
5. Pipe size must be approved by District Permits Engineer.
6. Construct 4:1 slopes at pipe ends. Safety headwalls may be required on pipes greater than 18".

District 4
Rev. 12/06



LOCATION OF DRIVEWAY ENTRANCE
37° 09' 42"
85° 54' 11"
S.R. 1846
Horse Cave
Gossett Knob
Radio Tower
Friendship Ch
Hidden River Cave
Water Tank
Horse Cave Lookout Tower
Sewage Disposal
Drive-in Theater
Our Lady of the Caves Ch
Caverna Memorial Hospital
Creacy Lake
Caverna High Sch
Pine Knob
Substation
Cem
LOUISVILLE AND NASHVILLE
HART CO
BARREN CO


N
18" RCP CULVERT
MINIMUM 475'±
R.O.W.
30'±
STATE ROUTE 1846
R.O.W.
25' R (TYP.)
PROPOSED 2 – 8' FARM GATES
CLEAR ALL SIGHT OBSTRUCTION AND VEGETATION FROM RIGHT-OF-WAY FOR A MINIMUM OF 475' FROM DRIVEWAY ENTRANCE
PROPOSED ACCESS ROAD TO WATER STORAGE TANK
50' EASEMENT FOR INGRESS & EGRESS
15'
50'
SCALE: 1" = 50'

SUITE 401
2 INTERNATIONAL PLAZA
NASHVILLE, TENNESSEE 37217

TELEPHONE: 615/366-6088
FAX: 615/366-6203

Water Management Services, LLC

ENGINEERING • PLANNING • OPERATIONS • RATE STUDIES

March 2, 2009

Mr. Alan Ingram
Inventory and Data Management Section
KPDES Branch
Kentucky Division of Water
200 Fair Oaks Lane – 4th Floor
Frankfort, Kentucky 40601

RE: Green River Valley Water District
US Hwy 31-E – Water Transmission Main
1.0 MG Water Storage Reservoir
WMS No. 08194

Dear Mr. Ingram:

On behalf of the Green River Valley Water District we are transmitting one copy of the KPDES - Notice of Intent for Storm Water Discharges for the Green River Valley Water District's US Hwy 31-E Water Transmission Main 1.0 MG Water Storage Reservoir project. Also included is a half sized set of the design drawings.

This project proposes the construction of a proposed 1.0 MG water storage tank south of Horse Cave, Kentucky along State Route 1846.

If additional information is required please call me at 366-6088 or email me at tgraves@wmsengineers.com. Upon your review, please email me and send your approval letter to me for distribution to the appropriate parties.

Sincerely,

Tim W. Graves

TWG/atl

Enclosures

ccs: Mr. David Paige, Manager, GRVWD

STORM WATER POLLUTION PREVENTION PLAN

for

Green River Valley Water District

US HWY 31-E WATER TRANSMISSION MAIN
1.0 MG WATER STORAGE RESERVOIR

Prepared by:

Water Management Services, LLC

WMS No. 08194

GREEN RIVER VALLEY WATER DISTRICT

US HWY 31-E WATER TRANSMISSION MAIN
1.0 MG WATER STORAGE RESERVOIR

STORM WATER POLLUTION PREVENTION PLAN

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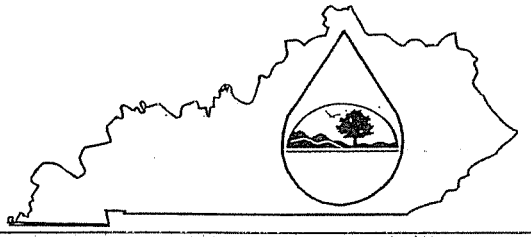
Features

KPDES FORM NOI-SW



Kentucky Pollutant Discharge Elimination System (KPDES)

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity Under the KPDES General Permit

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

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

I. Facility Operator Information

Name:	David Paige - Manager	**Phone:**	2707732135
Address:	PO Box 399	**Status of Owner/Operator:**	M
City, State, Zip Code:	Cave City, Kentucky 42127		

II. Facility/Site Location Information

Name:	Green River Valley Water District		
Address:	PO Box 399		
City, State, Zip Code:	Cave City, Kentucky 42127		
County:	Hart		
Site Latitude: (degrees/minutes/seconds)	37° 09' 42"	**Site Longitude: (degrees/minutes/seconds)**	85° 54' 04"

III. Site Activity Information

MS4 Operator Name:							
Receiving Water Body:	Green River						
Are there existing quantitative data?	**Yes** ☐ **If Yes, submit with this form.** **No** ☒						
SIC or Designated Activity Code Primary		**2nd**		**3rd**		**4th**	
If this facility is a member of a Group Application, enter Group Application Number:							
If you have other existing KPDES Permits, enter Permit Numbers:							

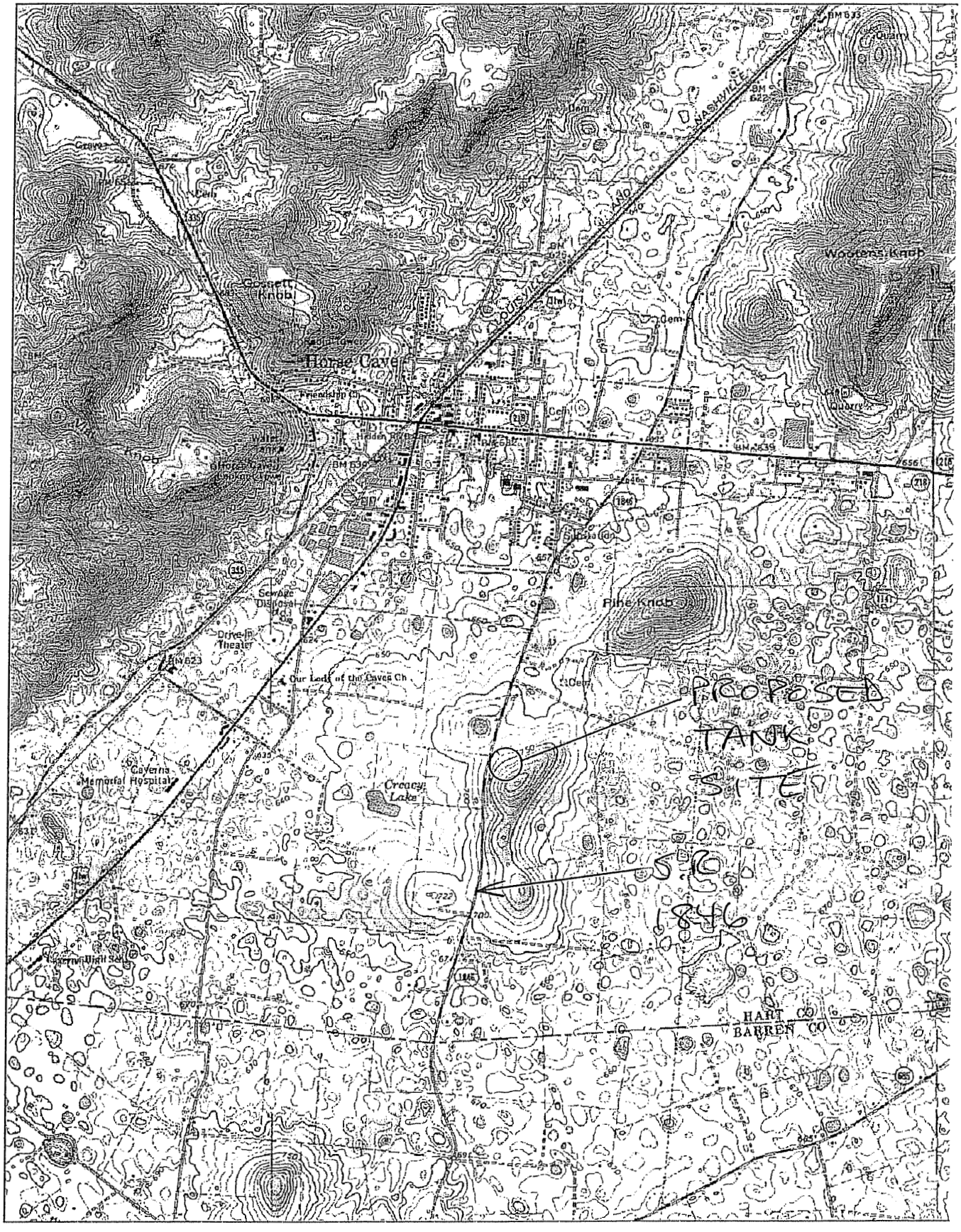
IV. Additional Information Required FOR CONSTRUCTION ACTIVITIES ONLY

Project Start Date:	April 2009	**Completion Date:**	June 2010
Estimated Area to be disturbed (in acres):		1.5 acres	
Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans?		**Yes** ☒ **No** ☐	

V. Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed or Typed Name:	**David Paige, Manager - Green River Valley Water District**		
Signature:	David Paige	**Date:**	2/3/09

Revised June 1999



0 0.75 Mi
0 4000 Ft

Map provided by MyTopo.com

General Information

The Storm Water Pollution Prevention Plan (SWPPP) and Notice of Intent (NOI) shall be kept onsite at all times during construction. For this project, erosion control and stream bank stabilization measures are shown on the project plans. Erosion control structures shall be constructed, inspected, and maintained per the requirements of this NOI/SWPPP and the project specifications. The Notice of Termination (NOT) shall be filed upon completion of the project. Construction shall be performed in such a manner as to prevent the discharge of polluted water into any stream or wetland. This plan may be amended to accommodate unforeseen circumstances during the course of the project. If amendments are made to the plan the changes will be implemented within 7 days.

Erosion control measures placed by other entities in the vicinity of this project shall be protected from damage. If temporary removal of other existing erosion control measures are required to facilitate construction, they shall be replaced as soon as possible in equal or better condition. The original installer or entity responsible for the maintenance of the erosion control measures shall be notified prior to removal.

1. Site and Project Descriptions

1a. The project is located south of Horse Cave, Kentucky, along State Route 1846.

The project consists of the installation of a proposed 1.0 MG water storage reservoir and access driveway located off of S.R. 1846.

1b. Work should proceed in the following sequence:
>Mobilization and delivery of equipment and materials to the site
>Installation of erosion control measures
>Initial layout and/or staking if necessary
>open cutting of trench, installation of gravity sewer in trench and backfilling
>cleanup, grading, and seeding of disturbed areas
>final inspection

1c. The total area expected to be disturbed is approx. 1.50 ac.

1d. Topography: N/A

1e. (omitted)

1f. Runoff coefficient for the project area is estimated at 0.2. This figure should remain unchanged after the project as the open cut trench will be restored to its original condition by grading, seeding, and strawing.

1g. Drainage map: See project plans, if applicable.

1h. No other discharge besides storm water should be generated by the execution of this project.

1i. Alteration to streams and / or wetlands and current ARAP tracking number: N/A

1j. The receiving body of any storm water runoff is Green River. There are no known wetlands (0 acres) affected on this project.

1k. Buffer zones for waters of the State: N/A

1l. Residential projects: N/A

1m. Projects of 50 acres or more, phase descriptions: N/A

1n. Protection of undisturbed areas: N/A

2 Erosion and Sediment Controls

2a. General Criteria

Erosion and sediment control measures for this project may include but are not limited to silt fences, straw bale barriers, check dams, detention areas, and trench plugs (subterranean earthen or concrete check dams). These devices will be properly installed according to manufacturer's recommendations and per State requirements. Sediment which escapes the project site will be recovered before entry into any storm sewer structure or stream. Sediment control structures will be inspected and maintained per State requirements of this permit and before 50% of capacity is reached. Litter, construction debris, etc. will be routinely collected and disposed of in such a manner as not to enter storm water, drainage features, streams, or interfere with sediment control devices.

Offsite material storage areas are subject to the same sediment and erosion control measures as the main project location. Existing vegetation in the project area shall not be disturbed more than 10 days prior to beginning earthwork unless the area is seeded and/or mulched or protected by temporary ground cover. Clearing and grubbing shall be kept to the minimum necessary for grading and equipment operation. Sound construction practices will be utilized by minimizing the exposure time of graded or exposed areas. Erosion and sediment control measures shall be in place prior to any actual earthwork begins and maintained throughout the life of the project. Temporary erosion control devices may be removed for work but will be replaced or restored before the end of the work day or before any immanent rainfall event.

No more than 50 acres of active soil disturbance is allowed at any one time during the construction project. Projects over 50 acres must be constructed in phases and completed areas must be stabilized within 15 days of completion.

The following records will be maintained: Dates of major grading, dates when construction is temporarily or permanently ceased on a portion of the site, and dates when stabilization measures are initiated.

2b. Stabilization Practices

Sound stabilization practices will be an integral part of the project from the onset of construction. This will include but not be limited to preserving natural turf, trees, and other vegetation whenever possible, careful placement of overburden within protected areas, geotextiles, sodding, and use of stone rip-rap on stream banks in a timely manner after backfilling operations are complete. Permanent soil stabilization (ie. seeding and strawing) shall be implemented as soon as possible after completion of grading. No stabilization, erosion, or treatment measures are to be installed in a stream without obtaining an ARAP.

2c. Structural Practices

Erosion and sediment control devices for this project shall include but not be limited to silt fencing, straw bale barriers, check dams, and temporary silt basins, etc. as shown on the erosion control plans. These devices shall be installed per State requirements of which details are included herein.

Discharges from the sedimentation basins shall be through pipe or grassy or lined channels. Muddy water pumped from the construction area shall be held in the basins for settling prior to releasing.

2d. Storm Water Management

Upon completion of the water main installation all trenches shall be finish graded, seeded, and strawed. This method is a standard procedure for finishing utility line installations and will ultimately provide permanent stabilization as the turf will have been restored to its original condition. Stone rip-rap will remain in place along disturbed areas of the stream bank as permanent stabilization. These measures will in no way affect the original hydrological regime of the local waters.

2e. Other Items Needing Control

No solid waste materials shall be discharged into the stream or its drainage features. Offsite vehicular tracking of sediments shall be minimized. Excess concrete will not be "washed out" from concrete trucks onsite.

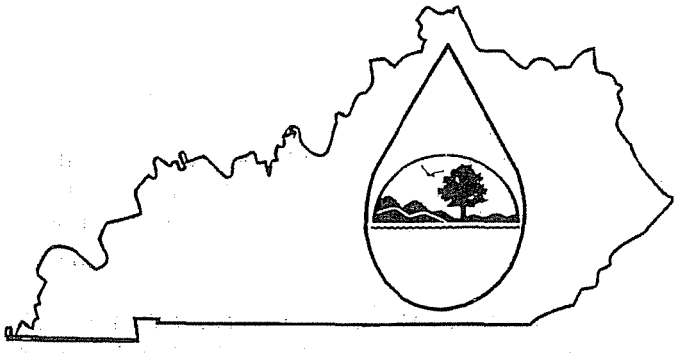
Vehicular access points to the site shall also be inspected for offsite sediment tracking.

3. Inspection and Maintenance

The erosion and sediment control structures shall be inspected and maintained regularly. Inspections shall be performed by the permittee (Contractor) at least twice per calendar week and at least 72 hours apart and repairs made if necessary. In general, any control measures in disrepair shall be replaced, modified, or repaired as necessary before the next rain event but in no case more than 7 days after the problem is identified.

Inspections shall be documented utilizing the standard form included herein. The form shall be prepared, signed, and maintained on site and be available upon request. Instructions for preparing the inspection form are included on said form.

KPDES FORM NOT-SW



Kentucky Pollutant Discharge Elimination System (KPDES)

NOTICE OF TERMINATION (NOT)

of Coverage Under the KPDES General Permit for Storm Water Discharges Associated with Industrial Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with industrial activity under the KPDES program.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.
(Please see instructions on back before completing this form.)

I. PERMIT INFORMATION
KPDES Storm Water General Permit Number:
Check here if you are no longer the Operator of the Facility: ☐
Check here if the Storm Water Discharge is Being Terminated: ☐
II. FACILITY OPERATOR INFORMATION
Name:
Address:
City/State/Zip Code:
Telephone Number:
III. FACILITY/SITE LOCATION INFORMATION
Name:
Address:
City/State/Zip Code:

Certification: I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a KPDES general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity of waters of the Commonwealth is unlawful under the Clean Water Act and Kentucky Regulations where the discharge is not authorized by a KPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Kentucky Revised Statutes.

NAME (Print or Type)	TITLE
SIGNATURE	*DATE*

SPECIAL CONDITIONS OF CONTRACT

1. Construction Operations and Material Storage

The Contractor must carry on all his construction operations, including storage of materials, in such a way as to interfere as little as possible with the operation and maintenance of existing water or wastewater treatment facilities.

2. Soil Erosion and Sediment Control

2.1 The Contractor shall plan and control his construction operations to minimize all soil erosion and the siltation of drains and streams resulting from such erosion. All methods used for such control shall be approved by the Engineer.

2.2 The Contractor's attention is directed to Division G, Section 3 (Construction) - "Slope Protection and Erosion Control." This provision will be required on this project. All work shall be performed in full compliance with requirements of the Commonwealth of Kentucky - Division of Natural Resources. The Contractor shall provide and use all measures necessary to comply with State regulations. No separate payment will be made for this work.

2.3 Where the Contractor's operations subject soil to erosion by the wind, he shall control such erosion by approved methods until affected areas can be seeded and mulched.

3. Project Sign

3.1 The Contractor shall furnish and erect one sign at an appropriate place on the project site as approved by the Engineer. The Contractor shall be responsible for protecting and maintaining the sign in good condition throughout the life of the project.

3.2 The sign will be fabricated of good quality 1-inch exterior plywood with suitable frames and posts. A 4-inch x 1¼-inch molding strip shall be placed around the outer edge projecting over the face of the sign. The entire woodwork shall be given a prime coat and final coats of high-grade sign enamel. The sign shall be not less than 4 feet by 8 feet and shall contain, at a minimum, the name of the Owner and its Officials, Project Name and Number, Contractor and Engineer. Layout of the sign shall be approved by the Engineer before painting. Lettering shall be done by a professional painter.

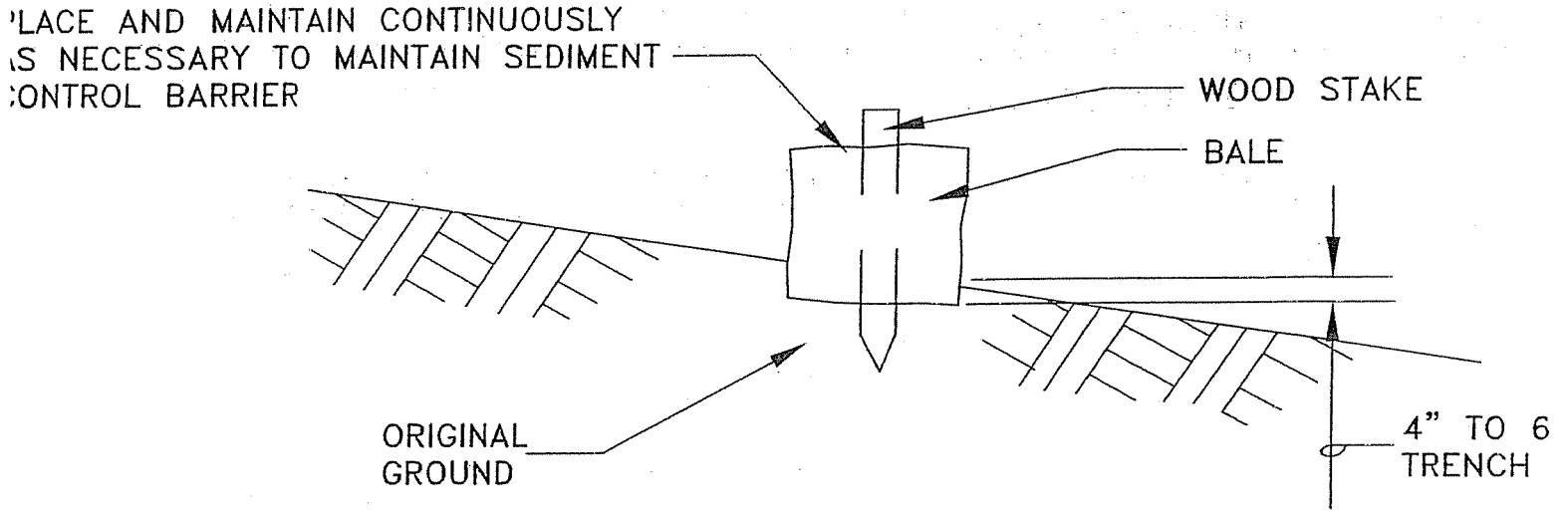
4. Contract Drawings

The Drawings applicable to the work to be performed under this Contract are referred to in this document as Contract Drawings and described as follows:

GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

OLD GLASGOW ROAD WATER STORAGE TANK
(PROJECT B)

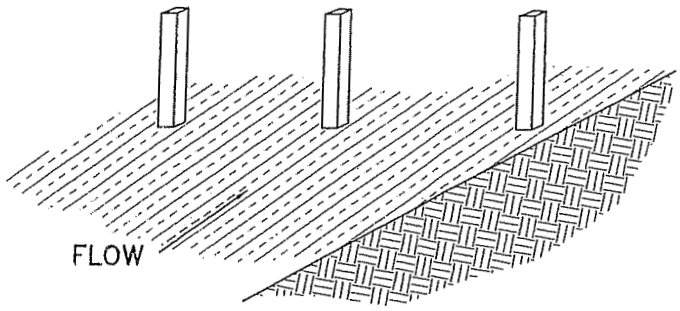
The sheet index and titles of all drawings appear on the index sheet of the Contract Drawings.

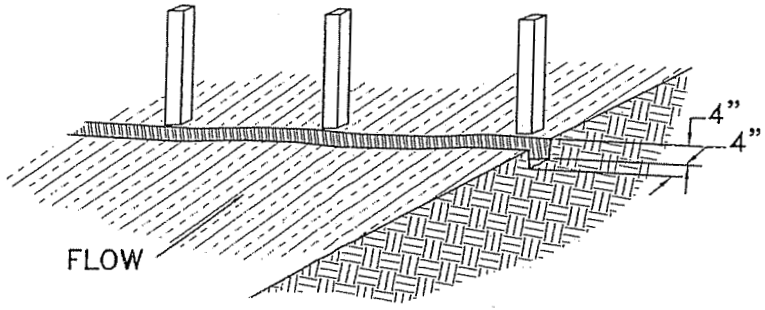


STRAWBALE SEDIMENT CONTROL BARRIER DETAIL

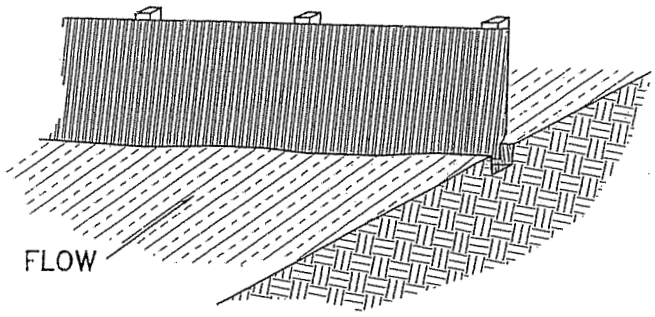
SCALE: NONE

THE LINE OF STAKES.

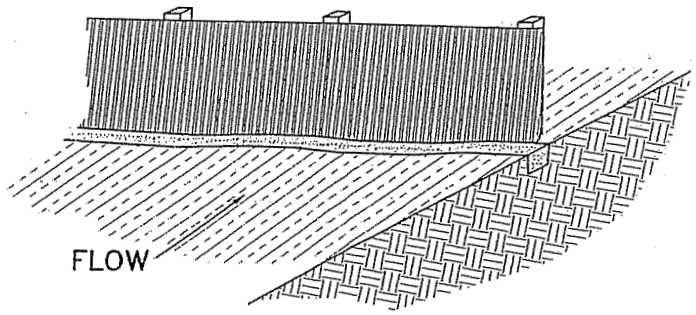




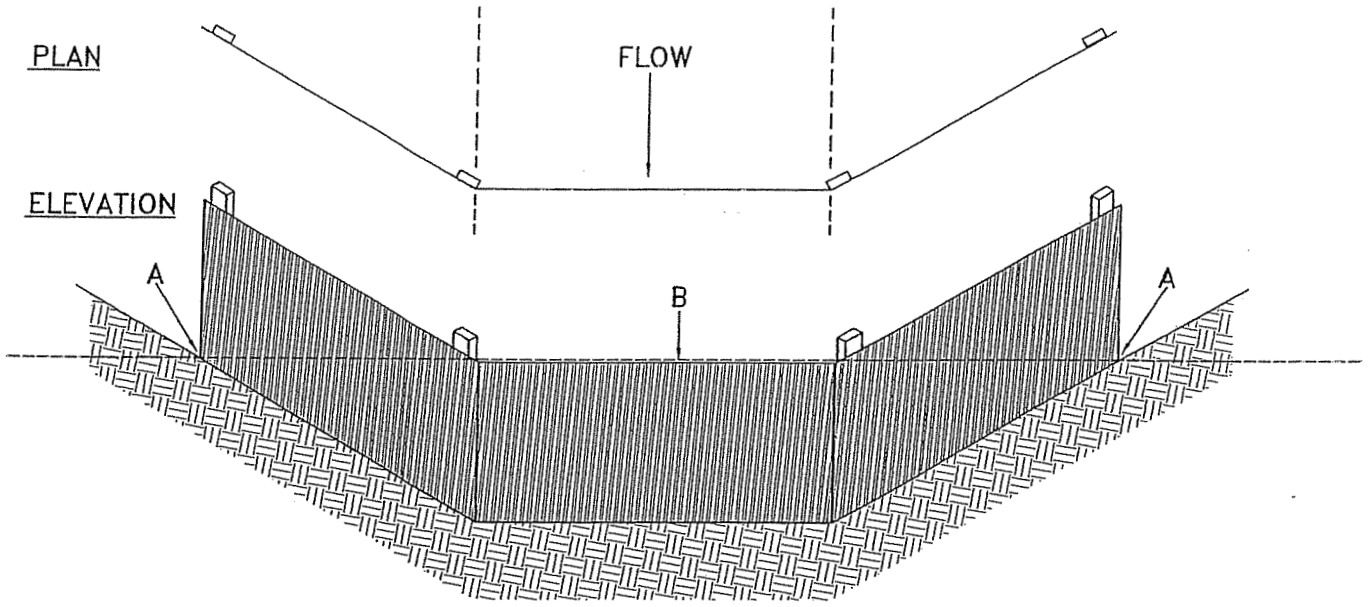
3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



CONSTRUCTION OF A FILTER BARRIER



POINTS "A" SHOULD BE HIGHER THAN POINT "B".

PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

SILTATION FENCE

08194

STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

April 20, 2009

Mr. David Paige, Manager
Green River Valley Water District
PO Box 399
Cave City, KY 42127

RE: Green River Valley Water District
AI # 1776, APE20090006
PWSID # 0500166-09-006
Highway 31-E Water Storage Reservoir
Hart County, KY

Dear Mr. Paige:

We have reviewed the plans and specifications for the above referenced project. The plans include the construction of approximately 675 ft of 16" PVC waterline and a 1,000,000 gallon ground storage tank. This is to advise that plans and specifications for the above referenced project are APPROVED with respect to sanitary features of design, as of this date with the requirements contained in the attached construction permit.

If you have any questions concerning this project, please contact Mr. Terry Humphries at 502-564-8158 extension 4837.

Sincerely,

Solitha W. Dharman

Solitha Dharman, PE
Supervisor, Engineering Section
Water Infrastructure Branch
Division of Water

SWD:TWH

Enclosures
C: Water Management Services, LLC
Hart County Health Department
Public Service Commission

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FOR
GENERAL CONDITIONS OF THE CONTRACT

GENERAL CONDITIONS OF THE CONTRACT

1. DEFINITIONS

Wherever used in the Contract Documents, the following terms or expressions or pronouns used instead shall have the meanings indicated which shall be applicable to both the singular and plural thereof.

1.1 "As directed," "as permitted," "reviewed," "acceptable," "approved," or words of similar import mean the direction, requirements, permission, approval, or acceptance of the Engineer, unless stated otherwise.

1.2 "As shown." "as indicated." "as detailed." or words of similar import refer to the Contract Drawings unless stated otherwise.

1.3 "Bidder" – any person, partnership, corporation, association, or affiliation submitting a bid for the work.

1.4 "Change order" – a written order to the Contractor authorizing an addition, deletion or revision in the work within the general scope of the Contract Documents or authorizing an adjustment in the Contract Price or Contract Time.

1.5 "Contract" – the Contract Documents referred to in the General Conditions of the Contract covering the performing of the work and the furnishing of all labor, equipment, materials, and other property required for the doing of the work and covering the doing of all other things required by said Contract Documents.

1.6 "Contract Drawings" or "Plans" – drawings which have been prepared by or on behalf of the Owner, as a basis for bids, when duly made a part of this Contract by incorporation or reference. Drawings submitted in pursuance of the terms of this contract by the successful bidder with his bid and by the Contractor to the Owner if and when approved by the Engineer. Drawings submitted by the Engineer to the Contractor during the progress of the work as provided for in the Contract.

1.7 "Contractor" -- the person, partnership, corporation, association, or affiliation with whom the Owner has executed the agreement.

1.8 "Date of award" – the date formal Notice of Award of the Contract, signed by the Owner, has been delivered to the successful bidder or mailed to him by registered mail (return receipt) at the business address shown in his bid by some officer or agent of the Owner duly authorized to give such notice.

1.9 "Day" – calendar day.

1.10 "Engineer" – the firm of Water Management Services, LLC, Nashville, Tennessee, acting through its authorized representatives.

1.11 "Final acceptance" – the date when the construction of the project is complete in accordance with the Contract Documents so that the entire project can be utilized for the purposes for which it is intended and all monies due the Contractor have been paid him in the final payment estimate.

1.12 "Inspector" – the engineering or technical inspector duly authorized or appointed by the Engineer or by the Owner, limited to the particular duties entrusted to him.

1.13 "Owner" – Green River Valley Water District, Cave City, Kentucky.

1.14 "Project" – the undertaking to be performed as provided in the Contract Documents.

1.15 "Provide" – means "furnish and install"

1.16 "Subcontractor" – a person, partnership, corporation, association, or affiliation other than the Contractor supplying labor and materials or labor only at the site of the work.

1.17 "Substantial completion" – the date as certified by the Engineer when the construction of the project or a specified part thereof is sufficiently completed in accordance with the Contract Documents so that the project or specified part can be utilized for the purposes for which it is intended.

1.18 "Suppliers" – any person or organization who supplies materials or equipment for the work, including that fabricated to special design, but who does not perform labor at the site.

1.19 "Work" – all labor necessary to produce the construction required by the Contract Documents and all material and equipment incorporated or to be incorporated in the project.

2. CONTRACT DOCUMENTS

2.1 General

The Contract Documents comprise the following general classifications of documents, including all additions, deletions, and modifications incorporated therein before the execution of the Agreement.

Bidding documents
Contractual documents
Conditions of the Contract
Specifications
Drawings

2.2 Bidding Documents

The bidding documents issued by the Owner to assist bidders in preparing their bids include:

2.2.1 Invitation to Bid bound herewith.

2.2.2 Instructions to Bidders bound herewith.

2.2.3 The bid which, is the offer of a bidder to perform the work described in the Contract Documents, made out and submitted on the prescribed bid form bound herewith, properly signed and guaranteed.

2.2.4 Any addenda issued during the time of bidding or forming a part of the Contract Documents used by the bidder for the preparation of his bid shall be covered in the bid and shall be made a part of the Contract. Receipt of each addendum shall be acknowledged in the bid.

2.3 Contractual Documents

2.3.1 Agreement

The Agreement covers the performance of the work described in the Contract Documents, including all supplemental addenda thereto and all general and special provisions pertaining to the work or materials therefore.

2.3.2 Bonds

The Contractor shall, at the time of his execution of the Agreement, furnish bonds payable to the Owner in the form of bonds set forth herein, secured by a surety company acceptable to the Owner, as follows:

2.3.2.1 Faithful performance bond in an amount equal to 100 percent of the total Contract amount, conditioned upon the faithful performance of all covenants and stipulations under the Contract and holding good for a period of one year after the final acceptance of the work to protect the Owner against the results of defective materials, workmanship, and equipment during that time.

2.3.2.2 Payment bond in an amount equal to 100 percent of the total Contract amount for the payment of all persons, companies, or corporations who perform labor upon or furnish material to be used in the work under this Contract.

2.3.2.3 It is the responsibility of the Contractor to notify all Surety companies and other signers of any of the bonds listed above to familiarize themselves with all of the conditions and provisions of this Contract. All Surety companies and other signers shall waive their right of notification by the Owner of any change or modification of this Contract, or of decreased or increased work, or of the cancellation of this Contract, or of other acts by the Owner or its authorized employees or agents under the terms of this Contract. The waiver by the Surety companies and other signers shall in no way relieve the Surety companies and other signers of their obligations under this Contract.

2.4 Conditions of Contract

2.4.1 Special Conditions of the Contract which shall supplement or amplify the General Conditions of the Contract and which are bound herewith.

2.4.2 General Conditions of the Contract bound herewith and of which this paragraph is a part.

2.4.3 Federal laws and regulations applicable to this Contract and bound herewith.

2.5 Specifications and Drawings

2.5.1 Contract Specifications bound herewith, which are listed in the Table of Contents for these Contract Documents.

2.5.2 Contract Drawings including, but not limited to, those listed in Volume II of the Contract Documents.

2.6 Discrepancies

Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported to the Engineer, who shall promptly correct such inconsistencies or ambiguities in writing. Any work done by the Contractor after such findings, until authorized, will be done at the Contractor's risk.

2.7 Interpretation of Specifications and Drawings

The Contract Specifications and the Contract Drawings are intended to be explanatory of each other. Any work indicated on the Contract Drawings and not in the Contract Specifications, or vice versa, is to be executed as if indicated in both. In the event of any doubt or question arising respecting the true meaning of the Contract Specifications or Drawings, reference shall be made to the Engineer and his decision thereon shall be final.

2.8 Dimensions

Finished surfaces, in all cases, shall conform with the lines, grades, cross-sections, and dimensions shown on the Contract Drawings. Deviations from the Contract Drawings, as may be required by the exigencies of construction, will in all cases be determined by the Engineer and authorized in writing by the Engineer or Owner. If additional dimensions are required, they shall be requested from the Engineer.

2.9 Titles and Headings

2.9.1 The titles and subheadings printed on the Contract Drawings, in the General Conditions, in the Contract Specifications, and elsewhere in the Contract Documents are inserted for the convenience of reference only and shall not be taken or considered as having any bearing on the interpretation thereof.

2.9.2 Separation of the Contract Specifications into Divisions and Sections shall not operate to make the Engineer an arbiter to establish limits of work between the Contractor and Subcontractors or between trades.

2.10 Additional Drawings and Instructions

2.10.1 The Contract Drawings and Specifications are intended to be comprehensive and to indicate, in more or less detail, the scope of the work. Should it appear that the work to be done or any of the matters relative thereto is not sufficiently detailed or explained in these Contract Documents including the Contract Drawings, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform thereto as part of this Contract, so far as may be consistent with the terms of the Contract.

2.10.2 In addition to these explanations, the Engineer may furnish additional drawings and instructions from time to time during the progress of the work to clarify or to define in greater detail the intent of the Contract Specifications and Contract Drawings, and the Contractor shall make his work conform to all such additional drawings and instructions.

2.11 Copies Furnished

2.11.1 The Owner will furnish to the Contractor, free of charge, 5 copies of Drawings and documents.

2.11.2 Additional sets desired will be furnished at printing cost, based upon commercial printing rates.

3. OWNER-CONTRACTOR-ENGINEER RELATIONS

3.1 Rights-of-Way

The Owner will provide all rights-of-way and easements for the work to be constructed by the Contractor under this Contract.

3.2 Surveys and Staking

The Contractor shall be responsible for establishing all construction lines, grades and measurements necessary for the proper prosecution and control of the work contracted for under these Specifications based on monuments and control points shown on the Contract Drawings. The Contractor shall furnish the Engineer "cut-sheets" for all lines showing plan grade, centerline grade, centerline cut, offset grade, and offset cut at manholes prior to excavation and/or drilling operations. The review of the "cut-sheets" by the Engineer does not relieve the Contractor of the responsibility for any errors therein or of proper line and grade in the prosecution of the work.

3.3 Suspension of Work

The Owner may at any time suspend the work, or any part thereof, by giving reasonable notice to the Contractor. The work shall be resumed by the Contractor on the date fixed in a written notice from the Owner to the Contractor. If suspension of the work is due to no fault of the Contractor and not otherwise authorized by other provisions of the Contract Documents, the Owner will reimburse the Contractor for such expense, if any, which is incurred by the Contractor in connection with the work under this Contract as a result of such suspension which would not have been incurred or reasonably required if there had not been such suspension; provided that there shall be no reimbursement if the period of suspension occurs after expiration of the time allowed for completion of the work, exclusive of any extension of time because of avoidable delays.

3.4 Right of Owner to Terminate Agreement

3.4.1 The Owner shall have the right to terminate his agreement with the Contractor after giving five days written notice of termination to the Contractor in the event of any default by the Contractor.

3.4.2 It shall be considered a default by the Contractor whenever he shall:

3.4.2.1 Declare bankruptcy, become insolvent, or assign his assets for the benefit of his creditors.

3.4.2.2 Disregard or violate provisions of the Contract Documents or fail to prosecute the work according to the agreed schedule of completion, including extensions thereof.

3.4.2.3 Fail to provide a qualified superintendent, competent workmen or subcontractors, or proper materials, or fail to make prompt payment therefore.

3.4.3 In the event of termination of the Agreement by the Owner because of default by the Contractor, the Owner may take possession of the work and of all materials and equipment thereon and may finish the work by whatever method and means he may select.

3.5 Emergency Protection

3.5.1 In case of an emergency which threatens loss, damage, or injury to persons or property and which requires immediate action to remedy, in the absence of the Contractor's personnel, then and in that event, the Owner, with or without notice to the Contractor or his Surety, may provide suitable protection to the said property and persons by causing such work to be done and such material to be furnished as shall provide such protection as the Owner may consider necessary and adequate. The cost and expense of such work and material so furnished shall be borne by the Contractor and, if the same shall not be paid on presentation of the bills therefore, then such costs shall be deducted from any amounts due or to become due the Contractor.

3.5.2 The performance of such emergency work under the direction of the Owner shall in no way relieve the Contractor from any damages which may occur during or after such precaution has been taken by the Owner.

3.6 Archaeological Finds

Notwithstanding anything to the contrary herein, in the event any archaeological artifacts within the project are discovered during the course of the work, the Owner shall have and retain all right, title, and interest to such artifacts and shall have the further right during the course of the Contract to examine or cause to have examined, the site of the work for any such artifacts and to perform or have performed archaeological excavations and all other related work to explore for, discover, recover and remove such artifacts from the site of the work. In the event the work of archaeological examination and related work delays the Contractor's work, he shall be entitled to an extension of time to complete the work equal to the number of days he is thus delayed.

3.7 Office of Contractor at Site

NOT A REQUIREMENT OF THIS PROJECT.

3.8 Attention to Work

The Contractor shall supervise the work to the end that it shall be prosecuted faithfully, and he shall at all times be represented by a competent superintendent or foreman who shall be present at the work and who shall receive and obey all instructions or orders given under this Contract; and who shall have full authority to execute the same, and to supply materials, tools and labor without delay; and who shall be the legal representative of the Contractor. The Contractor shall be liable for the faithful observance of any instructions delivered to him or to his authorized representative.

3.9 Protection of Existing Structures

Unless otherwise indicated on the Contract Drawings or unless otherwise taken care of by the Owner thereof, all utilities and all structures of any nature, whether below or above ground, that may be affected by the work shall be protected and maintained by the Contractor and shall not be disturbed or damaged by him during the progress of the work.

Should the Contractor disturb, disconnect, or damage any utility or any structure, all expenses of whatever nature arising from such disturbance or the replacement or repair thereof shall be borne by the Contractor.

3.10 Protection of Contractor's Work and Property

3.10.1 The Contractor shall protect his work, supplies, and materials from damage due to the nature of the work, the action of the elements, trespassers, or any cause whatsoever until the completion and acceptance of the work.

3.10.2 Neither the Owner nor any of its officers, employees, or agents assumes any responsibility for collecting indemnity from any persons or person causing damage to the work of the Contractor.

3.11 Surveys

3.11.1 The Contractor shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, and elevations.

3.11.2 The Contractor shall carefully preserve all bench marks, reference points, and stakes established by the Engineer and, in case he causes damage or disturbance, he will be charged for the cost of replacement and shall be responsible for any mistakes that may be caused by their loss.

3.12 Location of Utilities

3.12.1 The elevation and location of all utilities shown on the Contract Drawings were taken from public records. It shall be the duty of the Contractor to make final and exact determination of the location and extent of these utilities, and he will be liable for any expense resulting from damage to them.

3.12.2 Any expenses incurred by the Contractor for repair of damage, relocation, or removal of underground on-site piping and utilities not shown on the Contract Drawings or which cannot be reasonably inferred from visible above ground features will be assumed by the Owner, providing that the Contractor uses reasonable care in his discovery and repair operations. The Contractor shall immediately notify the Engineer of any facility discovered while performing work required by the Contract and which has not been identified on the Contract Drawings.

3.12.3 Because of the nature of the work, minor adjustments may be required in new construction to meet existing conditions. Adjustments, which may be accomplished without expense to the Contractor, shall be made without additional cost to the Owner.

3.13 Subcontractors

3.13.1 No Subcontractor will be recognized as such, and all persons engaged in the work of construction will be considered as employees of the Contractor and he will be held responsible for their work which shall be subject to the provisions of the Contract.

3.13.2 The Contractor shall perform with his own organization and with the assistance of workmen under his immediate supervision work of a value not less than thirty percent of the value of all work embodied in this Contract, except that furnishing and installing items of major equipment will be exempted from this requirement.

3.13.3 The Contractor shall notify the Owner in writing of the names of all Subcontractors he proposes to employ on the Contract and shall not employ any Subcontractors until the Owner's approval in writing covering such Subcontractors has been obtained.

3.13.4 Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the Owner. It shall be further understood that the Owner will have no direct relations with any Subcontractor. Any such necessary relations between Owner and Subcontractor shall be handled by the Contractor.

3.13.5 Should any Subcontractor fail to perform in a satisfactory manner the work undertaken by him, such subcontract shall be terminated immediately by the Contractor upon notice from the Owner.

3.14 Liability of Contractor

3.14.1 The mention of any specific duty or liability imposed upon the Contractor shall not be construed as a limitation or restriction of any general or other liability or duty imposed upon the Contractor by this Contract, said reference to any specific duty or liability being made merely for the purpose of explanation.

3.14.2 The Contractor shall be responsible to the Owner for the acts and omissions of all his employees and all Subcontractors, their agents and employees, and all other persons performing any of the work under an agreement with the Contractor.

3.15 Assumption of Risks

Until the completion and final acceptance by the Owner of all of the work under or implied by this Contract, except those portions which are under beneficial use by the Owner, all work shall be under the Contractor's care and charge and he shall be responsible therefore. The Contractor shall rebuild, replace, repair, restore, and make good all injuries, damages, re-erection, and repairs occasioned or rendered necessary by causes of any nature whatsoever to all or any portions of the work, except as otherwise stipulated.

3.16 Responsibility for Damage

3.16.1 The Contractor shall assume the defense of and indemnify and save harmless the Owner and each and every officer, employee, and agent thereof, and the Engineer from any and all loss, liability, or damage and from all suits, actions, damages, or claims of every name and description, to which the Owner or any of its officers, employees, or agents or the Engineer may incur or be subjected to put by reason of injury to persons or property in the execution of the work resulting from negligence or carelessness on the part of the Contractor, his employees, subcontractor, or agents in the delivery of materials and supplies; or by or on account of any act or omission of the Contractor, his employees, subcontractors, or agents including, but not limited to, any failure to fulfill the terms of or comply with all laws and regulations which apply to this Contract; and said Owner shall have the rights to estimate the amount of such damage and pay the same, and the amount so paid for such damage shall be deducted from the money due the Contractor under this Contract, or the whole or so much of the money due or to become due the Contractor under this Contract, as may be considered necessary by the Owner, shall be retained by the Owner until such suits or claims for damages shall have been settled or otherwise disposed of, and satisfactory evidence to that effect furnished to the Owner.

3.16.2 The rights of the Owner under this Contract in the control of the quality and completeness of the work shall not make the Contractor an agent of the Owner, and the liability of the Contractor for all damages to persons or to public or private property arising from the Contractor's execution of the work shall not be lessened because of the existence, exercise, or non-exercise of such rights.

3.17 Acceptance of Contractor's Plans

The acceptance by the Engineer of any drawing or any method of work proposed by the Contractor shall not relieve the Contractor of any of his responsibility for any errors therein and shall not be regarded as any assumption of risk or liability by the Owner or any officer or employee thereof; and the Contractor shall have no claim under the Contract on account of the failure or partial failure or inefficiency of any plan or method so accepted. Such acceptance shall be considered to mean merely that the Engineer has no objection to the Contractor's using, upon his own full responsibility, the plans or method proposed.

3.18 Suggestions to Contractor

Any plan or method of work suggested by the Engineer to the Contractor, but not specified or required, if adopted or followed by the Contractor in whole or in part, shall be used at the risk and responsibility of the Contractor, and the Engineer and the Owner shall assume no responsibility therefore.

3.19 Cooperation with Owner and Other Contractors

Any difference or conflict which may arise between the Contractor and other Contractors who may be performing work on behalf of the Owner or between the Contractor and workmen of the Owner in regard to their work shall be adjusted and determined by the Engineer. If the work of the Contractor is delayed because of any acts or omissions of any other Contractor of the Owner, the Contractor shall on that account have no claim against the Owner other than for an extension of time.

3.20 Authority of the Engineer

All work done under this Contract shall be done in accordance with the Contract Documents and in a good workmanlike manner. To prevent disputes and litigation, the Engineer shall, in all cases, determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under this Contract. The Engineer shall decide all questions relative to the true construction, meaning, and intent of the Contract Specifications and the Contract Drawings; shall decide all questions which may arise relative to the classifications and measurements of quantities and materials and the fulfillment of this Contract; and shall have the power to reject work or material which does not conform to the terms of this Contract. His estimate and decision in all matters shall be a condition precedent to an appeal to the Owner or the right of the Contractor to receive, demand, or claim any money or other compensation under this Contract and a condition precedent to any liability on the part of the Owner to the Contractor on account of this Contract. Whenever the Engineer shall be unable to act, in consequence of absence or any other cause, then such person as the Engineer or the Owner shall designate shall perform any and all of the duties and be vested with any or all of the powers herein given to the Engineer.

3.21 Inspection

Properly authorized and accredited inspectors shall be considered to be the representatives of the Owner with the duties and powers entrusted to them as provided herein but limited by paragraphs 5.11 and 5.12 of this Section. It will be their duty to inspect materials and workmanship of those portions of the work to which they are assigned, either individually or collectively, under instructions of the Engineer and to report any and all deviations from the Contract Drawings, Contract Specifications, and other Contract provisions which may come to their notice.

3.22 Observation of Completed Work

3.22.1 If any work is covered up without being inspected by the Engineer, it must, if required by the Engineer in writing, be uncovered for examination and properly restored at the Contractor's expense.

3.22.2 Re-examination of any work may be ordered by the Engineer and, if so ordered in writing, the Contractor shall remove or uncover such portions of the completed work as may be directed by the Engineer at any time before acceptance of the work. After examination, the Contractor shall restore the work to the standard required by the Contract Documents. Should the work thus exposed or examined prove acceptable, the uncovering or removing and the restoring of the work shall be paid for as extra work but, should the work exposed or examined prove unacceptable, the uncovering, removing, and restoring of the work shall be at the Contractor's expense.

4. MATERIALS, EQUIPMENT, AND WORKMANSHIP

4.1 General Quality of Materials

Materials and equipment shall be new and of a quality equal to that specified.

4.2 Quality in Absence of Detailed Specifications

Whenever under this Contract it is provided that the Contractor shall furnish materials or manufactured articles or shall do work for which no detailed specifications are set forth, the materials or manufactured articles shall be of the best grade in quality and workmanship obtainable in the market from firms of established good reputation or, if not ordinarily carried in stock, shall conform to the usual standards for first-class materials or articles of the kind required, with due consideration in either situation of the use to which they are to be put. In general, the work performed shall be in full conformity and harmony with the intent to secure the best standard of construction and equipment of the work as a whole or in part.

4.3 Materials and Equipment Specified by Name

Any material or equipment indicated or specified by brand or trade name also lists at least one additional brand or trade name of comparable quality or utility and is followed by the words "or equal" except for those items of material or equipment which may be required by Contract Specifications to match others in use in an existing facility. The Contractor may offer any material or equipment which shall be equal in every respect to that specified, but written acceptance of such equipment or material shall be obtained from the Engineer or the Owner. The decision of the Engineer or Owner shall be final.

4.4 Approval of Materials and Equipment

All materials and equipment offered to be furnished or furnished for the work are subject to inspection and approval or rejection by the Engineer. Insofar as practicable, approval shall be obtained prior to purchase and delivery of materials and equipment to the site of the work.

4.5 Removal of Condemned Materials, Structures, and Work

The Contractor shall remove from the site of the work, without delay, all rejected materials, structures, or work of any kind brought to or incorporated in the work and, upon his failure to do so, or to make satisfactory progress in so doing within two working days after the service of a written notice from the Engineer, the rejected material or work may be removed by the Owner and the cost of such removal shall be taken out of the money that may be due or may become due the Contractor on account of or by virtue of this Contract. No such rejected material shall again be offered for use by the Contractor under this Contract.

4.6 Sunday, Holiday, and Night Work

No work shall be done between the hours of six o'clock P.M. and seven o'clock A.M. nor on Saturdays, Sundays or legal holidays except such work as is necessary for the proper care and protection of work already performed or except in case of emergency and, in any case, only with the permission of the Engineer. It is understood, however, that night work may be established as a regular procedure by the Contractor if he first obtains the written permission of the Engineer and that such permission may be revoked at any time by the Engineer if the Contractor fails to maintain at night adequate force and equipment for reasonable prosecution and to justify inspection of the work.

4.7 Records of Employees

The Contractor and each Subcontractor shall keep an accurate record showing the name, place of residence, occupation, per diem pay, and actual hours worked each day and each calendar week by each person employed in connection with the work. The records shall be available at any time to the Engineer or his duly authorized representative.

4.8 Final Guarantee

4.8.1 All work shall be guaranteed by the Contractor for a period of one year from and after the date of acceptance of the work by the Owner.

4.8.2 If, within the guarantee period, repairs or changes are required in connection with guaranteed work which, in the opinion of the Engineer, is rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner and without expense to the Owner, do the following:

4.8.2.1 Place in satisfactory condition in every particular all of such guaranteed work and correct all defects therein.

4.8.2.2 Make good all damage to the building, or site, or equipment, or contents thereof which, in the opinion of the Engineer, is the result of the use of materials, equipment, or workmanship which are inferior, defective or not in accordance with terms of the Contract.

4.8.2.3 Make good any work or material, or the equipment and contents of building, structure, or site disturbed in fulfilling any such guarantee.

4.8.2.4 Submit a work schedule showing the dates of starting and completing the repair work.

4.8.3 If the Contractor, after notice, fails within 10 days to proceed to comply with the terms of this guarantee, the Owner may have the defects corrected, and the Contractor and his Surety shall be liable for all expense incurred; provided, however, that in case of an emergency where, in the opinion of the Owner, delay would cause loss or damage, repairs may be started without notice being given to the Contractor and the Contractor shall pay the cost thereof.

4.8.4 If minor repairs are made by the Owner without notice to the Contractor or if the Owner's personnel are used to assist the Contractor or an equipment supplier in making repairs to defective work, the Contractor will be billed for and shall pay the costs of the minor repairs and the cost associated with the use of Owner's personnel.

4.8.5 If, in order to make required repairs, it is considered necessary by the Contractor or the manufacturer that the repairs be made at the manufacturer's factory, the Contractor shall pay the cost of removing, crating, shipping, repairing, and reinstalling the equipment.

4.8.6 All special guarantees or warranties applicable to specific parts of the work as may be stipulated in the Contract Specifications or other papers forming a part of this Contract shall be subject to the terms of this paragraph during the first year of the life of each such guarantee. All special guarantees and manufacturers' warranties shall be assembled by the Contractor and delivered to the Engineer along with a summary list thereof before the acceptance of the work.

5. INSURANCE, LEGAL RESPONSIBILITY, AND SAFETY

5.1 Insurance

The Contractor shall take out, pay for, and maintain throughout the duration of, and specifically for this Contract the following insurance coverage.

5.1.1 Public Liability and Property Damage Insurance

5.1.1.1 For Contractor

This insurance shall protect the Contractor from claims for bodily injury and property damage (except automotive equipment) which may arise because of the nature of the work or from operations under this Contract.

5.1.1.2 For Owner and Engineer

This separate policy of insurance shall name the Owner, the Engineer, their partners, officers, agents and employees with respect to said work. Both bodily injury and property damage insurance must be on an occurrence basis, and said policy shall provide that the coverage afforded thereby shall be primary coverage to the full limit of liability stated in the declarations and, if said Owner, the Engineer, and their partners, officers, agents and employees have other insurance against the loss covered by said policy, that other insurance shall be excess insurance only. No exclusions shall be permitted by endorsement with the exception of preparation or approval of maps and plans, opinions, reports, surveys, designs, or specifications.

5.1.1.3 Amount of Coverage

Each of the above public liability and property damage policies of insurance shall provide coverage in the following minimum limits of liability:

1.	General Aggregate	$ 2,000,000
2.	Products/Completed Operations	$ 2,000,000
3.	Each Occurrence	$ 1,000,000
4.	Fire/Legal	$ 100,000
5.	Medical Payments	$ 5,000

5.1.1.4 Subcontractors

The public liability and property damage insurance shall not be deemed to require the Contractor to have his Subcontractors named as co-insureds in his policy of public liability and property damage, but the policy shall protect him from contingent liability which may arise from operations of his subcontractors. Also, the Contractor shall secure certificates of insurance as evidence that each Subcontractor carries insurance to provide coverage under this Contract to the same limits as is required by the Contractor. The Contractor shall submit copies of his Subcontractors insurance certificates to the Owner and the Engineer as evidence of insurance coverage.

5.1.1.5 Included Coverage

The above public liability and property damage insurance shall also include the following coverage's:

Premises - Operations - Escalators.

Contractor's protective (Subcontractors to the Contractor).

Products - Completed Operations.

Personal Injury (false arrest, libel, wrongful eviction, etc.).

Broad Form Property Damage.

XCU (explosion, collapse, underground damage). Exclusions deleted when applicable to operations performed by the Contractor or his Subcontractors.

Builders Risk

5.1.1.6 Comprehensive Automobile Liability

This insurance shall cover owned, hired, and other non-owned automobiles as shall protect the Contractor from claims for bodily injury or property damage which may arise from the use of motor vehicles engaged in various operations under this Contract. The automobile insurance shall provide minimum limits of liability for bodily injury of $500,000 for each person and $1,000,000 each occurrence, and $500,000 of property damage each occurrence.

5.1.1.7 Umbrella Policy

At the option of the Contractor, primary limits may be less than required with an umbrella policy providing the additional limits needed. This form of insurance will be acceptable provided that the primary and umbrella policies both provide the insurance coverages herein required, and further provide that the umbrella policy minimum limits of coverage are $1,000,000 per occurrence and $2,000,000 aggregate. The umbrella coverage shall not apply to the Owner's and Engineer's protective policy.

5.1.2 Workmen's Compensation Insurance

Before beginning the work, the Contractor shall furnish to the Owner satisfactory proof that he has taken out, for the period covered by the work under this Contract, full Workmen's Compensation insurance for all persons whom he may employ in carrying out the work contemplated under this Contract. In the event that the work of this Contract falls within the jurisdiction of the United States Longshoremans and Harbor Workers Compensation Act and liability under Admiralty and Railroad Employees Federal Liability Act, the Contractor shall extend his Workmen's Compensation insurance to provide and maintain in full force and effect during the period covered by this Contract insurance coverage under one or both of these Acts.

5.1.3 Workman's Occupational Diseases Insurance

Workman's occupational diseases insurance shall be taken out covering all persons whom the Contractor may employ in carrying out the work contemplated under this Contract.

5.2 Certificate of Insurance

The Contractor shall, at the time of execution of his Contract, file with the Owner a Certificate of Insurance in the form set forth herein, and copies of the policies covering all his insurance as required herein, and the policy or policies of insurance covering said Owner, the Engineer, and their partners, officers, agents, and employees. In those states where use of the preprinted Certificate of Insurance form is prohibited, the Contractor shall submit an approved form of Certificate of Insurance providing the coverages herein required. Each such policy and certificate shall be satisfactory to the Owner and shall bear an endorsement precluding cancellation, reduction, or change in coverage without giving the Owner at least 30 days prior notice thereof in writing. (The term "will endeavor to mail" shall not be acceptable.) Nothing contained in the insurance requirements shall be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from his operations under this Contract.

5.3 Notification of Insurance Companies

It is the responsibility of the Contractor to notify all insurance companies to familiarize themselves with all of the conditions and provisions of this Contract. The insurance companies shall waive their right of notification by the Owner of any change or modification of this Contract, or of decreased or increased work, or of the cancellation of this Contract, or of any other acts by the Owner or its tract. The waiver by the insurance companies shall in no way relieve the insurance companies of their obligations under this Contract.

5.4 Hold Harmless Agreement

Contractor shall indemnify and save harmless the Owner, the Engineer, and all of their partners, officers, agents, and employees from all suits, actions, or claims of any character brought for or on account of any injuries to or death of or damages received by any person, persons, or property resulting from the operations of the Contractor or any of his Subcontractors in prosecuting the work under this Contract, except only such damage, injury, or death as shall have been occasioned by the sole negligence of the Owner or Engineer.

5.5 Injury or Illness Reports

The Contractor shall file with the Engineer three copies of employer's first report of injury or illness immediately following any incident requiring the filing of said report during the prosecution of the work under this Contract. The Contractor shall also furnish to the Engineer three copies of the employer's first report of injury or illness involving any Subcontractor on this project.

5.6 Patents

5.6.1 Except as otherwise provided in these Contract Documents, the Contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work, and agrees to indemnify and save harmless the Owner, the Engineer, and their duly authorized representatives or employees from all suits at law, or actions of every nature for, or on account of the use of any patented materials, equipment, devices, or processes.

5.6.2 Should the Contractor, his agents, servants, or employees, or any of them be enjoined from furnishing or using any invention, article, material, or appliance supplied or required to be supplied or used under this Contract, the Contractor shall promptly offer other articles, materials, or appliances in lieu thereof, of equal efficiency, quality, finish, suitability, and market value for review by the Engineer. If Engineer should disapprove the offered substitutes and should elect, in lieu of a substitution, to have supplied and to retain and use any such invention, article, material, or appliance as may by this Contract be required to be supplied, the Contractor shall pay such royalties and secure such valid licenses as may be requisite and necessary for the Owner and officers, agents, and employees, or any of them to use such invention, article, material, or appliance without being disturbed or in any way interfered with by a proceeding in law or equity on account thereof.

Should the Contractor neglect or refuse to make any approved substitution promptly or to pay such royalties and secure such licenses as may be necessary, then, in that event, the Engineer shall have the right to make such substitution or the Owner may pay such royalties and secure such licenses and charge the cost thereof against any money due the Contractor from the Owner, or recover the amount thereof from him and his Sureties notwithstanding that final payment under this Contract may have been made.

5.6.3 Except as otherwise provided in these Contract Documents, Contractor shall pay all such royalties or other monies required to be paid as aforesaid.

5.7 Laws to be Observed

The Contractor shall keep himself fully informed of all existing and future federal, state, county, and municipal laws, ordinances, and regulations which in any manner affect those engaged or employed in the work or the materials used in the work or the conduct of the work or the rights, duties, powers, or obligations of the Owner or of the Contractor or which otherwise affect the Contract, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. He shall at all times observe and comply with and shall cause all his agents, subcontractors, and employees to observe and comply with all such laws, ordinances, regulations, orders and decrees and shall protect and indemnify the Owner and all of its officers, agents, and employees, and the Engineer against any claim, loss, or liability arising or resulting from or based upon the violation of any such law, ordinance, regulation, order or decree, whether by himself or by his agents, subcontractors, or employees.

5.8 Provisions of Law

It is specifically provided that this Contract is subject to all the provisions of law regulating and controlling the performance of work for the Owner, and that the rules of law shall prevail over any provision contained in any of the Contract Documents which may be in conflict thereto or inconsistent therewith. Each and every provision of law and clause required by law to be inserted in these Contract Documents shall be deemed to be inserted herein and the Contract Documents shall be read and enforced as though it were included herein and, if, through mistake or otherwise, any such provision is not inserted or is not correctly inserted, then upon application of

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

5.9 Deliveries to Contractor

Delivery by Owner or any of its agents or representatives to Contractor of any drawings, samples, notices, letters, communications, or other things may be made by personal delivery to Contractor; by personal delivery to Contractor's foreman or superintendent at the site of the work; by delivery to the Contractor's business address specified in the bid or specified in a written notice of changed address delivered to Owner; or by delivery to the Contractor's office at the site of the work. Delivery to the Contractor's above-mentioned business address or to Contractor's office at the site of the work may be made either by personal delivery to such address or office or by depositing the thing to be delivered in the United States mail, postage prepaid, addressed to such address or office.

5.10 Assignment of Contract

This Contract may not be assigned in whole or in part except upon the written consent of the Owner. Any assignment agreement shall be subject to review and approval by the Owner.

5.11 Protection of Persons and Property

5.11.1 The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The Contractor shall furnish such watchmen, guards, fences, warning signs, lights, and walkways and shall take all other precautions as shall be necessary to prevent damage to persons or property. All structures and improvements in the vicinity of the work shall be protected by the Contractor, his employees, subcontractors, or agents and it shall be restored to a condition as good as when he entered upon the work.

5.11.2 The duty of the Engineer to conduct construction inspection of the Contractor's performance does not include any review of the adequacy of the Contractor's safety measures in, on, or near the construction site or sites. The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences, or procedures required for the Contractor to perform his work.

5.12 Liability of Owner's Representatives and Officials

No official or employee of the Owner, nor the Engineer, nor any authorized assistant or agent of any of them shall be personally responsible for any liability arising under this Contract. The Engineer shall not be responsible for construction means, methods, techniques, sequences and procedures, time of performance, or for safety precautions and programs in connection with the construction work. The Engineer shall not be responsible for the Contractor's failure to carry out the work in accordance with the construction Contract. The Engineer shall not be responsible for acts or omissions of the Contractor, any Subcontractors, or any of their agents or employees, or any other persons performing any of the work.

6. PROGRESS AND COMPLETION OF WORK

6.1 Notice of Starting Work

The Contractor shall notify the Owner in writing 48 hours before starting work at the site of the work of his intentions to do so. In case of a temporary suspension of work, he shall give reasonable notice before resuming work.

6.2 Time of Completion

The Contractor shall promptly begin the work and prosecute the same until the work under this Contract shall be completed and ready for full use within the time specified in the Agreement.

6.3 Equipment and Methods

The work under this Contract shall be prosecuted with all materials, tools, machinery, apparatus, and labor, and by such methods as are necessary to complete the execution of everything described, shown, or reasonably implied in the Contract Documents. If at any time before the beginning or during the progress of the work, any part of the Contractor's plant or equipment or any of his methods of execution of the work appear to the Engineer to be inefficient or inadequate to ensure the required quality or rate of progress of the work, he may request and the Owner may order the Contractor to increase or improve his facilities or methods and the Contractor shall comply promptly with such orders, but neither compliance with such orders nor failure of the Owner to issue such orders shall relieve the Contractor from his obligation to secure the quality of the work and the rate of progress required. The Contractor alone shall be responsible for the safety, adequacy, and efficiency of his equipment and methods.

6.4 Unfavorable Weather and Other Conditions

During unfavorable weather and other unfavorable conditions, the Contractor shall pursue only such portions of the work as shall not be damaged thereby. No portions of the work whose satisfactory quality or efficiency will be affected by an unfavorable condition shall be constructed while these unfavorable conditions exist unless, by special means or precautions, the Contractor shall be able to overcome them.

6.5 Alterations, Deletions, and Extra Work

6.5.1 The Owner reserves the right to increase or decrease the quantity of any item or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Owner and, also, to make such alterations or deviations, additions to, or deletions from the work or the Contract Drawings and Specifications as may be determined during the progress of the work to be necessary and advisable for the proper completion thereof. Upon written order of the Owner, the Contractor shall proceed with the work as increased, decreased, or altered. Such work shall be considered a part of and subject to all terms and requirements of the Contract Documents.

6.5.2 The Engineer is authorized to order on behalf of the Owner minor changes in the work which do not involve extra cost to Owner and which do not change the character of the work. He is not authorized to order any other changes, alterations, deletions, additions, or extra work unless they are approved in a Contract Supplement properly authorized in writing by the Owner.

6.5.3 No claim of the Contractor for extra compensation because of any change, alteration, deletion, addition, or extra work will be paid or be payable unless a written order for such change, alteration, deletion, addition, or extra work is signed by the authorized representative of the Owner. All adjustments, if any, in the Contract Price to be paid to Contractor because of any such change, alteration, deletion, addition, or extra work shall be made only to the extent and in the manner provided under the paragraph, "Payment For Extra Work and Work Deleted" in these General Conditions. Such alterations shall in no way affect, vitiate, or make void this Contract or any part thereof, except that which is necessarily affected by such alterations and is clearly the evident intention of the parties to this Contract.

6.5.4 In case of neglect or refusal by the Contractor to perform any extra work which may be authorized by the Owner or to make satisfactory progress in its execution, the Owner may employ any person or persons to perform such work and the Contractor shall not in any way interfere with or molest the person or persons so employed.

6.5.5 When any changes decrease the amount of work to be done, such changes shall not constitute a basis or reason for any claim by Contractor for extra compensation or damages on account of any anticipated profits which he thereby loses on the omitted work, and Contractor shall not be entitled to any compensation or damages therefore.

6.6 Delays

6.6.1 Avoidable Delays

6.6.1.1 Avoidable delays in the prosecution or completion of the work shall include all delays which might have been avoided by the exercise of care, prudence, foresight, or diligence on the part of the Contractor.

6.6.1.2 Delays in the prosecution of parts of the work which may, in themselves, be unavoidable but do not necessarily prevent or delay the prosecution of other parts of the work nor the completion of the whole work within the time herein specified; reasonable loss of time resulting from the necessity of submitting drawings to the Engineer for approval and from the making of surveys, measurements, and inspections; and such interruptions as may occur in the prosecution of the work on account of the reasonable interference of other contractors employed by the Owner, which do not necessarily prevent the completion of the whole work within the time herein specified, will be deemed avoidable delays within the meaning of this Contract.

6.6.2 Unavoidable Delays

Unavoidable delays in the prosecution or completion of the work under this Contract shall include all delays which may result through causes beyond the control of the Contractor and which he could not have provided against by the exercise of care, prudence, foresight, or diligence. Orders issued by the Owner changing the amount of work to be done, the quantity of material to be furnished, or the manner in which the work is to be prosecuted; failure of the Owner to provide rights-of-way; and unforeseen delays in the completion of the work of other contractors under contract with the Owner will be considered unavoidable delays, so far as they necessarily interfere with the Contractor's completion of the whole of the work.

6.6.3 Notice of Delays

6.6.3.1 Whenever the Contractor foresees any delay in the prosecution of the work and, in any event, immediately upon the occurrence of any delay, he shall notify the Engineer in writing of the probability of the occurrence of such delay and its cause in order that the Engineer may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the work are to be delayed thereby.

6.6.3.2 After the completion of any part or the whole of the work, the Engineer, in approving the amount due the Contractor, will assume that any and all delays which have occurred in its prosecution and completion have been avoidable delays, except such delays as shall have been called to the attention of the Engineer at the time of their occurrence and later found by him to have been unavoidable. The Contractor will make no claims that any delay not called to the attention of the Engineer at the time of its occurrence has been an unavoidable delay.

6.7 Extension of Time

6.7.1 For Unavoidable Delays

For delays which are unavoidable, as determined by the Owner, the Contractor will be allowed, if he applies for the same, an extension of time beyond the time specified for completion, proportionate to such unavoidable delay or delays within which to complete the Contract, and Contractor will not be charged, because of any extension of time for such unavoidable delay, any engineering and inspection costs as are charged in the case of extensions of time for avoidable delays.

6.7.2 For Avoidable Delay

6.7.2.1 If the work called for under this Contract is not finished and completed by the Contractor, in all parts and in accordance with all requirements, within the time specified for completion elsewhere in these Contract Documents, including extensions of time granted because of unavoidable delay; or, if at any time prior to the expiration of said time, it should appear to Owner that Contractor will be unable to finish and complete said work as aforesaid within said time; and, if Contractor's failure or inability to finish and complete said work as aforesaid within said time should be due, as determined by Owner, to avoidable delay or delays, then, in that event, the Owner, if it finds such to be for the best interests of the Owner may, but will not be required to, grant to Contractor an extension or extensions of time within which to finish and complete all said work.

6.7.2.2 In addition, if the time limit be so extended, the Owner shall charge to Contractor, and may deduct from the final payment for the work, all engineering and inspection expenses incurred by Owner in connection with the work during the period of such extension or extensions, except that the cost of final surveys and preparation of final estimates will not be included in such charges. Such expenses of Owner shall be computed on the basis of the hourly schedule of charges set forth in these General Conditions of the Contract.

6.7.3 Effect of Extension of Time

The granting of any extension of time on account of delays, which in the judgment of the Owner are avoidable delays, shall in no way operate as a waiver on the part of the Owner of its rights under this Contract.

6.8 Proof of Compliance with Contract

In order that the Engineer may determine whether the Contractor has complied with those requirements of this Contract with which compliance is not readily ascertainable through inspection and tests of the work and materials, the Contractor shall, at any time requested, submit to the Engineer properly authenticated documents or other satisfactory evidence as proof of his compliance with such requirements.

7. PAYMENTS TO CONTRACTOR

7.1 Progress Estimates and Payments

7.1.1 The Contractor shall on the 25th day of each calendar month, together with a representative of the Engineer, make an estimate of the value of the work performed in accordance with this Contract since the last preceding estimate was made. The Contractor shall then prepare and submit the estimate to the Engineer on the periodical estimate for partial payment forms. Payment forms will be supplied by the Owner. The number of copies to be submitted will be determined by the Engineer after construction has started.

7.1.2 Upon presentation of certified copies of purchase bills and freight bills, the Owner will permit inclusion in such monthly estimates payment for materials that will eventually be incorporated in the project, providing that such material is suitably stored on the site at the time of submission of the estimate for payment. At the time the next following monthly estimate is submitted, certified copies of receipted purchase and freight bills for the stored materials included in the monthly payment estimate submitted two months previously shall be submitted. If the Contractor fails to submit proof of payment with the monthly payment estimate, those items of stored materials for which no proof of payment has been submitted will be deleted from the current payment estimate. Such materials when so paid for by the Owner will become the property of the Owner and, in case of default on the part of the Contractor, the Owner may use or cause to be used by others these materials in construction of the project. However, the Contractor shall be responsible for safeguarding such materials against loss or damage of any nature whatsoever and, in case of any loss or damage, the Contractor shall replace such lost or damaged materials at no cost to the Owner.

7.1.3 Except as otherwise provided in the immediately preceding paragraph, the first estimate shall be of the value of the work done and of materials proposed and suitable for permanent incorporation in the work, delivered, and suitably and safely stored at the site of the work since the Contractor shall have begun the performance of this Contract; and every subsequent estimate, except the final estimate, shall be of the value of the work done and materials delivered and suitably stored at the site of the work since the last preceding estimate was made.

7.1.4 No estimate shall be required to be made when, in the judgment of the Engineer, the total value of the work done and materials incorporated into the work under this Contract since the last preceding estimate amount to less than $5,000.

7.1.5 The estimates shall be signed by the Engineer and approved by the Owner and, after such approval, the Owner, subject to the foregoing provisions, will pay or cause to be paid an amount equal to the estimated value of the work performed less a retained amount in accordance with the following schedule.

7.1.5.1 Five percent until construction is substantially complete. The Contractor's attention is directed to provisions in the Special Conditions to the Contract for additional withholding of payments to the Contractor relating to timely property restoration and final clean-up.

7.1.5.2 When the project is substantially complete (operational or beneficial use as determined by the Engineer), the retained amount will be only that necessary to assure completion of the Contract Work.

7.2 Unit Price Items

7.2.1 Unit price items listed in the Bid Form and in the Agreement Form may be of two types, "Unit price construction items," and "Unit price work items ordered by the Engineer during construction." For all unit price items, quantities as set forth are the best estimates which can be made during design since actual quantities cannot be determined until construction is underway. If any of said quantities is exceeded by not more than 15 percent of the quantity listed, no Contract Supplement for the additional work will be required. If any one of said quantities exceeds the quantity listed by more than 15 percent a Contract Supplement for any work greater than 115 percent will be required before payment for such additional work will be made. Unit prices for quantities in excess of 115 percent are subject to renegotiation of the Contract unit price.

7.2.2 If any work under a unit price item is not performed or if only a small percentage of the quantity listed is used, the Contractor shall not make any claims for not using said item or for higher unit prices because of the small percentage of quantity used.

7.2.3 The Contractor shall study carefully the Specifications to determine the extent and scope of the work included under lump sum items in the Contract. It may be that work under some unit price items is in addition to similar work to be performed under lump sum items and paid for thereunder.

7.2.4 Unit Price Construction Items

Unit price construction items will be used to pay for work not included under a lump sum item but required by the Contract.

7.2.5 Unit Price Work Items Ordered by the Engineer During Construction

These unit price items will be used to pay for designated work not shown on the Contract Drawings when ordered by the Engineer in writing during construction.

7.3 Payment for Extra Work and Work Deleted

7.3.1 Whenever corrections, additions or modifications in the work under this Contract change the amount of work to be done or the amount of compensation due the Contractor except as provided for unit price items, the Owner will prepare a Contract Supplement setting forth the extra work to be performed or work to be omitted. Such a Contract Supplement will also set forth the method of computing the added or reduced compensation to be due the Contractor. The method of computing the added or reduced compensation will be determined under one or more of the following methods as selected by the Owner.

7.3.1.1 By unit prices contained in the Contractor's original bid and incorporated in this construction Contract.

7.3.1.2 By negotiated unit prices for items not included in the Contractor's original bid.

7.3.1.3 By an acceptable lump sum price proposal by the Contractor.

7.3.1.4 By force-account.

7.4 Force-Account Payment

7.4.1 When work is to be paid for on a force-account basis the Contractor will be paid the actual cost of labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work plus an amount to be agreed upon to cover the cost of general overhead and profit to be negotiated.

7.4.2 It is understood that labor, materials, and equipment may be furnished by the Contractor or by a Subcontractor or by others on behalf of the Contractor. When the work is performed by forces other than the Contractor's organization, the Contractor shall reach agreement with such other forces as to the distribution of the payment made by the Owner for such work and no additional payment therefore will be made by the Owner.

7.4.3 The costs for labor, materials, and equipment will be determined as provided in the following paragraphs.

7.4.4 Labor

7.4.4.1 The actual wages in performing the work, whether the employer is the Contractor, Subcontractor, or other forces, will be the amount paid to workmen including foremen and superintendents devoting their exclusive attention to the work in question. The actual wages shall include payments to, or on behalf of, workmen for health and welfare, pension, vacation, and similar purposes.

7.4.4.2 To the actual wages will be added 15 percent, which percentage shall constitute full compensation for all payments imposed by state and federal laws, for Workmen's Compensation, for public liability and property damage insurance, and for all other payments made to, or on behalf of, the workmen other than actual wages.

7.4.5 Materials

7.4.5.1 Only materials incorporated in the work will be paid for, the cost of which will be the cost to the purchaser, whether Contractor, Subcontractor, or other forces, from the supplier thereof. If the Contractor does not furnish satisfactory evidence of the cost of such materials from the supplier thereof or if the cost of such materials is excessive in the opinion of the Engineer, then the cost of such materials shall be deemed to be the lowest current wholesale price at which such materials are available in the quantities concerned delivered to the job site, less any discounts.

7.4.5.2 The Owner reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and profit on such materials.

7.4.6 Equipment

7.4.6.1 The Contractor will be paid for the use of equipment at the rental rates established as provided in the following paragraphs, which rates shall include the cost of fuel,, depreciation, storage, insurance, and all incidentals. Operators of rented equipment will be paid for as provided under "Labor."

7.4.6.2 Unless otherwise specified, manufacturer's rating shall be used to classify equipment for the determination of applicable rental rates.

7.4.6.3 For the use of any equipment normally required for the Contract regardless of whether the equipment is already on the work or is to be delivered to the work and regardless of ownership and any rental or other agreement entered into by the Contractor for the use of such equipment, the Contractor will be paid as provided herein at the current local rental rates used by established distributors or equipment rental agencies.

7.4.6.4 Individual pieces of equipment not listed and having a replacement value of 50 dollars or less shall be considered to be tools or small equipment and no payment will be made for their use on the work.

7.4.6.5 In computing the hourly rental of equipment, less than 30 minutes shall be considered 1/2 hour except that the minimum rental time to be paid per day shall be one hour. Rental time will not be allowed while equipment is inoperative due to breakdowns or non-working days.

7.4.6.6 The rental time of equipment to be paid for shall be the time the equipment is in operation on the force-account work being performed and, in addition, shall include the time required to move the equipment to the site of such force-account work and return it to its original location or to another location requiring no more time than that required to return it to its original location, except that moving time will not be paid for if the equipment is used at the site of the force-account work on other than the force-account work. Loading and transporting costs will be allowed when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the force-account work on other than the force-account work. For the use of equipment not required under the Contract and moved in on the work and used exclusively for force-account work, the Contractor will be paid as provided above, except that the rental period shall begin at the time the equipment is unloaded at the site of the force-account work and shall terminate at the end of the day on which the order to discontinue the force-account work is given to the Contractor by the Engineer. The minimum total rental time to be paid for shall be eight hours.

7.4.7 Reporting and Invoicing

All force-account work shall be reported daily and signed by the Contractor and the Engineer, which daily reports shall thereafter be considered the true record of force-account work done. Completely detailed invoices covering the force-account work shall be submitted for payment not later than 15 days after the completion of the work. The charges for work performed by the Contractor, by a Subcontractor, and by an employee of a Subcontractor shall be reported separately. Substantiating invoices from suppliers, vendors and Subcontractors shall be included with the Contractor's invoices. The Contractor shall permit examination of accounts, bills, and vouchers relating to the force-account work when requested by the Engineer.

7.5 Owner's Right to Withhold Certain Amounts

7.5.1 The Owner may withhold from payments to the Contractor, in addition to the retained percentage, such an amount or amounts as may be necessary to cover:

7.5.1.1 Payments that may be earned or due for just claims for labor or materials furnished in and about the work.

7.5.1.2 Defective work not remedied.

7.5.1.3 Failure of the Contractor to make proper payments to a Subcontractor.

7.5.1.4 Reasonable doubt that this Contract can be completed for the balance then unpaid.

7.5.1.5 Damage to another Contractor, where there is evidence thereof.

7.5.1.6 Excess cost of field engineering, inspection, and other expenses.

7.5.2 The Owner will disburse and shall have the right to act as agent for the Contractor in disbursing such funds as have been withheld pursuant to this paragraph to the party or parties who are entitled to payment therefrom. The Owner will render to the Contractor a proper accounting of all such funds disbursed in behalf of the Contractor.

7.5.3 The Owner also reserves the right, even after full completion and acceptance of the work, to refuse payment of the final amount due the Contractor until it is satisfied that all Subcontractors, material suppliers, and employees of the Contractor have been paid in full.

7.6 Excess Cost of Engineering and Inspection for Time Extension

These General Conditions of the Contract provide for the payment by Contractor to the Owner of certain engineering and inspection expenses in the event Owner should grant to Contractor an extension or extensions of time because of avoidable delay. The amount of said engineering and inspection expenses shall be computed and determined on the basis of the per hour schedule of charges for a 40-hour straight time work week as shown in Column 1 of the following schedule. For any overtime beyond the regular 40-hour work week and for any time worked on Sunday or holidays, the charges for such personnel will be as shown in Column 2 of the following schedule:

	Straight Time for each hour	Overtime for each hour
Resident Engineer	$43.00	$64.50
Inspectors	$30.50	$45.75

The method of payment for these excess engineering and inspection expenses shall be in the form of deductions from the Contractor's periodical and final payment requests.

7.7 Payment for Uncorrected Work

If any portion of the work done or material furnished under this Contract proves defective and not in accordance with the Contract Documents; and if the imperfection in the same is not of sufficient magnitude or importance to make the work dangerous or wholly undesirable; or if the removal of such work is impracticable or will create conditions which are dangerous or undesirable, the Engineer shall have the right and authority to retain such work instead of requiring the imperfect work to be removed and reconstructed, but he shall recommend to the Owner such deductions therefore in the payments due or to become due the Contractor as may be just and reasonable, and Owner may make such deductions as are just and reasonable.

7.8 Payment for Work by the Owner Following Termination of the Contract

Upon termination of the Contract by the Owner in accordance with "Right of Owner to Terminate Agreement," no further payments shall be due the Contractor until the work is completed. If the unpaid balance of the Contract Amount shall exceed the cost of completing the work, including all overhead costs, the excess shall be paid to the Contractor. If the cost of completing the work shall exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The cost incurred by the Owner, as herein provided, and the damage incurred through the Contractor's default shall be certified by the Owner.

7.9 Acceptance

Any part of the work may be accepted in writing by the Owner when it shall have been completed in accordance with the terms of the Contract Documents as determined by the Owner and its official representatives. When the work is substantially completed, the Contractor shall notify the Owner, in writing, that the work will be ready for final inspection and test on a definite date which shall be stated in such notice. The notice shall be given at least 10 days in advance of said date and shall be forwarded through the Engineer. The Owner shall cause an inspection to be made in order to determine whether the work has been completed in accordance with the terms of the Contract Documents.

7.10 Final Estimate and Payment

7.10.1 The Contractor shall, as soon as practicable after the final acceptance of the work by the Owner under this Contract, make a final estimate of the amount of work done thereunder and the value thereof. Such final estimate shall be checked, approved, and signed by the Engineer and by the official representative of the Owner after approval of the governing body of the Owner. After such approval, the Owner shall pay or cause to be paid to the Contractor, in the manner provided by law, the entire sum so found to be due hereunder after deducting therefrom all previous payments and such other amounts as the terms of this Contract prescribe.

7.10.2 Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall deliver to the Owner a complete release of all claims or liens arising out of this Contract or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he has knowledge or information the release and receipts include all the labor and materials for which a lien or claim could be filed, but the Contractor may, if a Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner to indemnify the Owner against any claim or lien (in cases where such payment is already guaranteed by surety bond). If any claim or lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

AGREEMENT WITH THE
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

STATE ROUTE 1846
1.0 MG WATER STORAGE RESERVOIR

THIS AGREEMENT made this _____ day of _____, 200__, by and between the Green River Valley Water District, hereinafter called the "Owner," and _____, hereinafter called the "Contractor."

WITNESSETH:

WHEREAS, Owner has heretofore solicited bids for all the work and improvements and for the doing of all things included within the hereinafter specified improvements; and

WHEREAS, Owner did on the _____ day of _____, 200__ find that Contractor was the lowest responsible bidder for the hereinafter specified construction work and did award Contractor a Contract for said construction work;

NOW, THEREFORE, for and in consideration of their mutual promises, covenants, undertakings and agreements, the parties hereto do hereby agree as follows:

ARTICLE I - WORK TO BE DONE BY CONTRACTOR

Contractor agrees, at his own cost and expense, to do all the work and furnish all the labor, materials, equipment and other property necessary to do, construct, install, and complete all the work and improvements required for the State Route 1846 1.0 MG Water Storage Reservoir all in full accordance with and in compliance with and as required by the hereinafter specified Contract Documents, including any and all Addenda for said work, and to do, at his own cost and expense, all other things required of the Contractor by said Contract Documents of said work.

ARTICLE II - CONTRACT DOCUMENTS

The Contract Documents herein named include all of the following component parts, all of which are as fully a part of this Contract as if herein set out verbatim or, if not attached, as if hereto attached:

1. Invitation to Bid
2. Instructions to Bidders
3. Proposal
4. Special Conditions of Contract
5. General Conditions of Contract
6. Agreement
7. Contract Specifications
8. Contract Drawings
9. All Bonds, Insurance Certificates and Insurance Policies mentioned or referred to in the foregoing documents
10. Any and all other documents or papers included or referred to in the foregoing documents
11. Any and all Addenda to the foregoing

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GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

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6. Agreement
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8. Contract Drawings
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10. Any and all other documents or papers included or referred to in the foregoing documents
11. Any and all Addenda to the foregoing

ARTICLE III - CONTRACT AMOUNT

The Contractor agrees to receive and accept the unit prices stated in the Contractor's Proposal included in the Contract Documents and made a part of this Agreement as full compensation for furnishing all materials and equipment and for doing all the work contemplated and embraced in this Contract; also for all loss or damage arising out of the nature of the work aforesaid or from the action of the elements or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by the Owner, and for all risks of every description connected with the work; also for well and faithfully completing the work, and the whole thereof, in the manner and according to and in compliance with the Contract Documents and the requirements of the Engineer under them; also for any and all other things required by the Contract Documents.

The quantities and totals on unit price items and the Total Contract Amount are approximate only, being inserted for the purpose of establishing the face amount of bonds to be provided by the Contractor. Payment of work covered by the unit price items will be made only on the basis of actual quantities of work complete in place as authorized and as measured as provided in the Contract Documents.

Item No.	Description	Estimated Quantity	Unit	Price Per Unit	Total
A.	Lump Sum Construction Items for Water Facilities				
1	1.0 MG Wire Wound Circular Prestressed Concrete water storage tank and all appurtenances	1	LS	$ _____	$ _____
B.	Unit Price Construction Items for Water Facilities				
2	16" Class 50 DIP or AWWA C-905; DR-18; Class 235 PVC water main under and/or outside roadway with 3" detection tape and trace wire	700	LF	$ _____	$ _____
3	6" R.S. seat gate valve (restrained) including valve box	1	EA	$ _____	$ _____
4	Miscellaneous D.I.P. fittings (restrained)	750	LBS	$ _____	$ _____
5	Fire hydrant assembly	1	EA	$ _____	$ _____
6	Asphalt access roadway entrance including 8-inch compacted stone base and 2-inch C.W. asphalt binder	100	SY	$ _____	$ _____
7	Crushed Stone access roadway with 10-inch compacted stone base, 15-foot wide	1,500	SY	$ _____	$ _____
8	Topsoil and seeding of trenches	1,400	LF	$ _____	$ _____
9	Concrete for thrust blocking	10	CY	$ _____	$ _____
C.	Supplemental Unit Price Items Ordered By the Engineer				
10	Supplemental rock excavation	200	CY	$ _____	$ _____
11	Stone refill material	200	CY	$ _____	$ _____
12	Supplemental dirt excavation	200	CY	$ _____	$ _____
13	Class C concrete refill material	75	CY	$ _____	$ _____

Item No.	Description	Estimated Quantity	Unit	Price Per Unit	Total
14	Test Drilling	75	LF	$_____	$_____

TOTAL$_____

ARTICLE IV - CONFLICT BETWEEN COMPONENT PARTS OF CONTRACT

In the event that any provision in any of the following component parts of this Contract conflicts with any provision in any other of the following component parts, the provision in the component part first enumerated below will govern over any other component part which follows it numerically, except as may be otherwise specifically stated. Said component parts are the following:

1. Addendum Nos. _____, _____, _____, and _____.
2. Special Conditions of Contract
3. General Conditions
4. Contract Specifications
5. Contract Drawings
6. Instructions to Bidders
7. Invitation to Bid
8. Contractor's Proposals
9. This Instrument

This Contract is intended to conform in all respects to applicable statues of the state in which the work is to be constructed and, if any part or provision of this Contract conflicts therewith, the said statute shall govern.

ARTICLE V - STARTING AND COMPLETION

The Contractor shall, and agrees to, commence work at the site within 15 calendar days after the issuance by the Owner of a written Notice to Proceed, and to fully complete all work to the point of final acceptance by the Owner, and to complete doing all other things required of him by the Contract Documents on or before and not later than **240 consecutive calendar days** therefrom. Contractor shall, and agrees to, furnish and deliver to Owner within fifteen (15) days after date of award of this Contract, the Performance Bond, Payment Bond, and the insurance certificates and policies of insurance required of him by the provisions of the Conditions of the Contract, and to do, prior to starting work, all other things which are required of him by the Contract Documents as a prerequisite of starting work.

NOTE: The Contractor's attention is directed to the provisions for liquidated damages as provided in Paragraph 13 of the Special Conditions.

The Contractor hereby agrees to commence work on this Project on or before a date to be specified in a written "Notice to Proceed" issued by the Owner and to fully complete the project within **240 consecutive calendar days** as stipulated in the Special Conditions. Bidder further agrees to pay as liquidated damages the sum of $200.00 per day for each consecutive calendar day thereafter as provided in Paragraph 13 of the Special Conditions.

A subsurface soil investigation will be required by the Tank Contractor to determine the soils bearing pressure for the design of the foundation. A minimum of three (3) borings should be drilled with one at the tank center and two (2) at 180 degrees apart on the foundation circle diameter at a depth of 30 feet. The report will be written on the results of the test, and this will form the basis of the design. The investigation shall be completed by a qualified and independent geotechnical engineer. All cost required for the subsurface investigation and report shall be the responsibility of the contractor.

ARTICLE VI - PAYMENTS TO CONTRACTOR

The Owner agrees with said Contractor to employ, and does hereby employ, the said Contractor to provide the materials and do all the work and do all other things hereinabove mentioned according to the terms and conditions hereinabove contained or referred to for the prices aforesaid, and hereby contracts to pay the same at the time, in the manner and upon the conditions set forth or referred to in the Contract Documents; and the said parties for themselves, their heirs, executors, administrators, successors and assigns, do hereby agree to the full performance of the covenants herein contained.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed in four original counterparts the day and year first above written.

(SEAL)

_____
CONTRACTOR

ATTEST:

BY _____ BY _____

TITLE _____ TITLE _____

ATTEST: GREEN RIVER VALLEY WATER DISTRICT

BY _____ BY _____
Manager

TITLE _____

APPROVED AS TO FORM AND LEGALITY

By: _____
Attorney for the Owner

IMPORTANT

NOTE: If the Contractor is a corporation, the legal name of the corporation shall be set forth above together with a signature of the officer or officers authorized to sign Contracts on behalf of the corporation; if Contractor is a partnership, the true name of the firm shall be set forth above together with the signatures of all the partners; and if Contractor is an individual, his signature shall be placed above. If signature is by an agent other than an officer of a corporation or a member of a partnership, a power-of-attorney must be attached hereto. Signature of Contractor shall also be acknowledged before a Notary Public or other person authorized by law to execute such acknowledgment.

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called
(corporation, partnership or individual)

Principal, and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto the Green River Valley Water District, P.O. Box 399, Cave City, Kentucky, hereinafter called Owner, in the total aggregate penal sum of _____ _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal entered into a certain Contract with the Owner dated the _____ day of _____, 200__, a copy of which is hereto attached and made a part hereof for the construction of the State Route 1846 1.0 MG Water Storage Reservoir.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the Owner with or without notice to the Surety and during the one year guaranty period and if the Principal shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the Owner and from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to work to be performed thereunder of the Specifications accompanying same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

PROVIDED, FURTHER, that it is expressly agreed that the bond shall be deemed amended automatically and immediately, without formal and separate amendments thereto, upon amendment to the Contract not increasing the Contract price more than 20 percent, so as to bind the Principal and the Surety to the full and faithful performance of the contract as so amended. The term "amendment," wherever used in this bond, and whether referring to this bond, the Contract or the Loan Documents shall include alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the Owner and the Principal shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The Owner is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in four counterparts, each one of which shall be deemed an original, this the _____ day _____, 200__.

ATTEST:

_____
Principal

_____
Principal Secretary

(SEAL)

BY _____

_____

_____
(Address)

_____
Witness as to Principal

_____
(Address)

_____ _____
Surety

ATTEST:

_____ BY _____
Witness to Surety Attorney-in-Fact

_____ _____
Address Address

_____ _____

NOTE: Date of Bond must not be prior to date of Contract.

If Contractor is partnership, all partners should execute Bond.

Approved as to Form and Legality

By _____
Attorney for the Owner

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called
(corporation, partnership or individual)

Principal, and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto the Green River Valley Water District, P.O. Box 399, Cave City, Kentucky, hereinafter called Owner, for labor and/or materials furnished by any and all persons, firms, partnerships, associations, or corporations interested in the total aggregate penal sum of _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal entered into a certain Contract with the Owner dated the _____ day of _____, 200__, a copy of which is hereto attached and made a part hereof for the construction of the State Route 1846 1.0 MG Water Storage Reservoir.

NOW, THEREFORE, if the Principal shall promptly make payment to all person, firms, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract, and any authorized extensions or modifications thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and for all labor cost incurred in such work including that by a subcontractor, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State of Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the subcontractors, and persons, firms and corporations having a direct Contract with the Principal or its subcontracts.

PROVIDED, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) unless claimant, other than one having a direct Contract with the Principal, shall have given written notice to any two of the following: The Principal, the Owner or the Surety above named within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer. (b) After the expiration of one (1) year following the date of the Principal ceased work on said Contract, it being understood, however, that if any limitation embodied in the Bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that the bond shall be deemed amended automatically and immediately, without formal and separate amendments thereto, upon amendment to the Contract not increasing the Contract price more than 20 percent, so as to bind the Principal and the Surety to the full and faithful performance of the Contract as so amended. The term "amendment," wherever used in this bond, and whether referring to this bond, the Contract, or the Loan Documents shall included alteration, addition, extension, or modification of any character whatsoever.

IN WITNESS WHEREOF, this instrument is executed in four counterparts, each one of which shall be deemed an original, this the _____ day _____, 200__.

ATTEST:

_____
Principal Secretary

(SEAL)

_____
Principal

BY _____

_____

_____
(Address)

_____
Witness as to Principal

_____
(Address)

_____

_____
Surety

ATTEST:

_____
Witness to Surety

BY _____
Attorney-in-fact

_____
Address

_____
Address

_____

_____

NOTE: Date of Bond must not be prior to date of Contract.

If Contractor is partnership, all partners should execute Bond.

Approved as to Form and Legality

By _____
Attorney for the Owner

AFFIDAVIT

(To be attached to all Contracts)

STATE OF _____)
)ss
COUNTY OF _____)

_____

being first duly sworn on oath deposes and says that he is

_____
(attorney) (in fact or agent)

of_____
(bonding company)

surety on the attached contract for the State Route 1846 1.0 MG Water Storage Reservoir executed by

_____
(Contractor)

Affiant further deposes and says that no officer, official or employee of the Owner has any interest directly or indirectly, or is receiving any premium, commission fee or other thing of value on account of the same or furnishing of the bond, undertaking or contract of indemnity, guaranty, or suretyship in connection with the above-mentioned Contract.

Signed _____

Subscribed and sworn to before me

this _____ day of _____, A.D., 200__.

_____

Notary Public _____ County _____)

My Commission expires: _____

CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY)

PRODUCER

☐

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER	A
COMPANY LETTER	B
COMPANY LETTER	C
COMPANY LETTER	D
COMPANY LETTER	E

INSURED

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENTS, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO LTR	TYPE OF INSURANCE	POLICY NO.	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS
	GENERAL LIABILITY				GENERAL AGGREGATE $
	☐ COMMERCIAL GENERAL LIABILITY				PRODUCTS-COMP/OPS AGGREGATE $
	☐ CLAIMS MADE ☐ OCCURRENCE				PERSONAL & ADVERTISING INJURY $
	☐ OWNERS & CONTRACTORS PROTECTIVE				EACH OCCURRENCE $
					FIRE: DAMAGE (ANY ONE FIRE) $
					MEDICAL EXPENSE (ANY ONE PERSON) $
	AUTOMOBILE LIABILITY				CSL $
	☐ ANY AUTO				BODILY INJURY PER PERSON $
	☐ ALL OWNED AUTOS				
	☐ SCHEDULED AUTOS				
	☐ HIRED AUTOS				PROPERTY DAMAGE $
	☐ NON - OWNED AUTOS				
	☐ GARAGE LIABILITY				
	EXCESS LIABILITY				EACH OCCURRENCE $ / AGGREGATE $
	☐ UMBRELLA FORM				
	☐ OTHER THAN UMBRELLA FORM				
	WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY				STATUTORY
					$ EACH ACCIDENT
					$ DISEASE-POLICY LIMIT
					$ DISEASE-EACH EMPLOYEE
	OTHER				

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / RESTRICTIONS / SPECIAL ITEMS

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICES BE CANCELED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY SHALL MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT.

AUTHORIZED REPRESENTATIVE

WATER MANAGEMENT SERVICES, LLC
2 International Plaza, Suite 401
Nashville, Tennessee 37217

Sheet ____ of ____

Owner: _____

Project Name: _____

Location: _____

Contractor: _____

Contract Supplement No. _____

Date: _____

I. DESCRIPTION OF CHANGES INVOLVED

A.

B.

II. ADJUSTMENTS IN AMOUNT OF CONTRACT

1.	Amount of Original Contract	$_____
2.	Net (Addition) (Reduction) due to all previous Contract Supplements	$_____
3.	Amount of Contract including all previous Contract Supplements	$_____
4.	(Addition) (Reduction) to Contract due to this Contract Supplement	$_____
5.	Amount of Contract including this Contract Supplement	$_____

III. CONTRACT SUPPLEMENT CONDITIONS

1. The Contract completion date established in the Original Contract or as modified by previous Contract Supplements is hereby _____.

2. Any additional work to be performed under this Contract Supplement shall be carried out in compliance with the specifications included in the preceding Description of Changes Involved, with the supplemental contract drawings, and under the provisions of the Original Contract, including compliance with applicable Equipment Specifications and Project Specifications for the same type of work.

3. This Contract Supplement, unless otherwise provided herein, does not relieve the Contractor from strict compliance with the guarantee provisions of the Original Contract, particularly those pertaining to performance and operation of equipment.

4. The Contractor expressly agrees that he will place under coverage of his Performance and Payment Bonds and Contractor's Insurance all work covered by this Contract Supplement. The Contractor will furnish to the Owner evidence of increased coverage of his Performance and Payment Bonds for the accrued value of all Contract Supplements which exceeds the Original Contract Price by twenty percent (20%).

RECOMMENDED FOR ACCEPTANCE:

WATER MANAGEMENT SERVICES, LLC

ACCEPTED: CONTRACTOR:

CONTRACTOR

BY: _____

OWNER:

GREEN RIVER VALLEY WATER DISTRICT

BY: _____
Manager

Approved as to Form and Legality

By: _____
Attorney for the Owner

NOTICE OF AWARD

TO: _____
_____
_____
_____

Project Description: _____
_____
_____

The Owner has considered the Bid submitted by you for the above described work in response to its Advertisement for Bids dated _____, 200__, and Instructions to Bidders.

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

You are required by the Instructions to Bidders to execute the Agreement and furnish the required Contractor's Performance Bond, Payment Bond and Certificate of Insurance within fifteen (15) days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said bonds within fifteen (15) days from the date of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Bid as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Dated this _____ day of _____, 200__.

_____
Owner

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by _____

_____ this the _____ day of _____, 200__.

By: _____

Title: _____

NOTICE TO PROCEED

TO: _____
_____
_____
_____

Date: _____

Project: _____

You are hereby notified to commence work in accordance with the Agreement dated _____, 200__, on or before _____, 200__, and you are to complete the work within _____ calendar days thereafter. The date of completion of all work is, therefore, _____, 200__.

_____
Owner

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged by _____,

_____ this the _____ day of _____, 200__.

By: _____

Title: _____

CONTRACT SPECIFICATIONS

DIVISION A - GENERAL REQUIREMENTS

TABLE OF CONTENTS

FOR

DIVISION A

GENERAL REQUIREMENTS

GENERAL REQUIREMENTS

SECTION 1

SUMMARY OF WORK

1. WORK COVERED BY CONTRACT DOCUMENTS

The Work to be performed is as described in the Invitation to Bid.

2. CONTRACTOR'S DUTIES

2.1 Except as specifically noted, provide and pay for:

Labor, materials, and equipment;

Tools, construction equipment, and machinery;

Samples, shipping costs, and tests;

Necessary utilities, such as water supply, electrical power, telephones, roads, fences, and sanitary facilities, including maintenance thereof;

Other facilities and services necessary for proper execution and completion of the Work.

2.2 Pay legally required sales, consumer, and use taxes.

2.3 Secure and pay for legally required permits, licenses, and government fees.

2.4 Give required notices.

2.5 Employ workmen and foremen with sufficient knowledge, skill, and experience to perform the work assigned to them.

2.6 Comply with the codes, laws, ordinances, rules, regulations, orders, and other legal requirements. Any necessary changes will be adjusted as provided in the Contract for changes in the Work.

2.7 Submit written notice to Engineer of observed variance of Contract Documents from legal requirements. Any necessary changes will be adjusted as provided in the Contract for changes in the Work.

2.8 Enforce discipline and good order among Contractor and Subcontractor employees. Any person employed by Contractor or Subcontractors who does not perform his work in a skillful manner, is incompetent, or acts in a disorderly or intemperate manner shall, at the written request of Owner, be removed from the project immediately and shall not be employed again in any portion of the Work without the approval of Owner.

2.9 Provide at all times facilities for access and inspection of the Work by representatives of Owner and of official governmental agencies designated by Owner as having the right to inspect the work.

2.10 Cooperate with other contractors who may be performing work for Owner and with Owner's employees working in the vicinity of the Work done under this Contract.

3. CONTRACTOR'S USE OF PREMISES

3.1 Confine operations at site to areas permitted by law, ordinances, permits, and the Contract Documents.

3.2 Do not load or permit any part of a structure to be subjected to any force that will endanger its safety.

3.3 Comply with and enforce Owner's instructions regarding signs, advertisements, fires, and smoke.

3.4 Assume responsibility for protection and safekeeping of products stored on premises.

3.5 Do not discharge smoke, dust, or other contaminants into the atmosphere, or fluids or materials into any waterway as will violate regulations of any legally constituted authority.

4. EXISTING FACILITIES

4.1 The existing facilities will be in continuous operation during the construction period.

4.2 Plan and conduct construction operations to avoid disturbing existing utilities, piping, equipment, and services in any manner which will interrupt or impair operations, except as approved by Engineer.

4.3 Submit for approval a construction sequence and detailed drawings and written explanations of the temporary facilities and appurtenances intended to be used in maintaining the uninterrupted operation of the existing water and sewer facilities.

5. PARTIAL OWNER OCCUPANCY

5.1 Owner, at its discretion, may place into service certain portions of the completed Work.

5.2 Provide proper access to Owner's personnel for this purpose.

5.3 Use and operation of a completed portion by Owner will constitute acceptance of that work.

5.4 Liability of Contractor for defects due to facility construction will extend for one year after the Work is placed in service.

GENERAL REQUIREMENTS

SECTION 2

SUBMITTALS

1. PROGRESS SCHEDULE

1.1 Prepare a detailed Progress Schedule in graphic form showing proposed dates of starting and completing each major division of the Work.

1.2 The schedule shall be consistent with the time and order of work requirements of the Specifications and shall be the basis of Contractor's operations.

1.3 Submit 3 copies to Engineer within 14 days after Notice to Proceed.

1.4 At the end of every month, submit a revised schedule showing the current status of the Work as compared to the projected status. The current application for a progress payment will not be processed until the revised schedule is delivered to Engineer.

2. BREAKDOWN OF CONTRACT AMOUNT

2.1 Submit a typewritten breakdown of major lump sum items for use in computing and checking periodical payment estimates.

2.2 No payment will be made until the breakdown has been submitted and accepted by Engineer and Owner.

2.3 The breakdown shall establish amounts for each division of work such as excavation, concrete, piping, electrical, process equipment, backfill, restoration, etc.

3. SHOP DRAWINGS, PROJECT DATA, AND SAMPLES

3.1 General

3.1.1 Submit to Engineer shop drawings, project data, and samples required by the Specifications.

3.2 Shop Drawings

3.2.1 Shop drawings are original drawings prepared by the Contractor, subcontractors, suppliers, or distributors which illustrate some portion of the Work and show fabrication, layout, setting, or erection details of equipment, materials, and components.

3.2.2 Unless otherwise instructed, submit to Engineer for review and approval 5 prints of each plan.

3.3 Project Data

3.3.1 Project data are manufacturers' standard schematic drawings, catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.

3.3.2 Modify drawings to delete information not applicable and to add information applicable to the project.

3.3.3 Mark copies of printed material to identify pertinent materials, products, or models.

3.3.4 Show dimensions and clearances required, performance characteristics and capacities, and wiring diagrams and controls.

3.3.5 Submittal procedures shall be the same as for shop drawings.

3.4 Contractor Responsibilities

3.4.1 Review and approve shop drawings, project data, and samples before submitting them.

3.4.2 Verify field measurements, field construction criteria, catalog numbers, and similar data.

3.4.3 Coordinate each submittal with the requirements of the Contract Documents.

3.4.4 Submit shop drawings for major equipment items in one package to permit checking complete installation details.

3.4.5 In a clear space above the title block or on the back, hand stamp the following and enter the required information:

Specification Section .....

This document has been checked for accuracy of content and for compliance with the Contract Documents and is hereby approved. The information contained herein has been coordinated with all involved contractors.

Contractor .....

Signed .....

3.4.6 Contractor's responsibility for errors, omissions, and deviations from requirements of the Contract Documents in submittals is not relieved by Engineer's review.

3.4.7 Notify Engineer, in writing at time of submittal, of deviations in submittals from requirements of the Contract Documents.

3.4.8 Do not install materials or equipment which require submittals until the submittals are returned with Engineer's stamp and initials or signature indicating approval.

3.4.9 Revise returned shop drawings as required and resubmit until final approval is obtained. Indicate on the Drawings any changes which have been made other than those requested by Engineer.

3.4.10 Submit new project data and samples when the initial submittal is returned disapproved.

3.4.11 No claim will be allowed for damages or extension of time because of delays in the work resulting from rejection of material or from revision and resubmittal of shop drawings, project data, or samples.

3.5 Engineer's Duties

3.5.1 Engineer will review submittals for compliance with the Contract Documents and with the design concept of the project.

3.5.2 Review of a separate item does not constitute acceptance of an assembly in which the item functions.

3.5.3 Engineer will affix a stamp to the returned copy of each submittal. The stamp will be marked to indicate whether the submittal is "Reviewed," "Furnish as Corrected," or "Revise and Resubmit," and an explanation will be given if the submittal is unsatisfactory. The stamp will be initialed or signed certifying the submittal review.

4. OPERATING AND MAINTENANCE MANUALS

4.1 Furnish 5 copies of manuals of instructions for operation and maintenance of each item of equipment and valves furnished.

4.2 Include instructions for all components of the equipment, whether manufactured by the supplier or not, including valves, controllers, and other miscellaneous components.

4.3 Included Material as follows:

- Parts lists.
- Exploded or sectional views.
- Recommended lubrication and maintenance procedures.
- Internal wiring and piping diagrams.
- Detailed description of process, where applicable.
- Operating procedures.
- Other pertinent information of value to obtain peak performance.

4.4 Equipment Maintenance Schedule

4.4.1 In addition to the equipment operation and maintenance manuals, an equipment maintenance schedule shall be prepared for each piece of equipment. The schedule shall list routine preventive maintenance recommended by the equipment manufacturer. The schedule shall be listed as daily, weekly, monthly, quarterly, semiannually and annually.

4.4.2 The items listed in the schedule shall be those maintenance functions that Contractor and equipment suppliers expect the plant operating personnel to follow in order to meet warranty provisions, when the equipment is turned over to Owner.

4.4.3 The schedule for each piece of equipment shall be prepared in the same format. No photocopies or reproductions of the various equipment operation and maintenance manuals will be permitted.

DIVISION H - WATER MAINS AND APPURTENANCES

TABLE OF CONTENTS

FOR

DIVISION H

WATER MAINS AND APPURTENANCES

WATER MAINS AND APPURTENANCES

SECTION 1

GENERAL REQUIREMENTS

1. GENERAL

1.1 Scope of Work

The water mains and appurtenances required on this Contract shall be furnished in full compliance with the Contract Specifications and the Contract Drawings.

Work to be performed under the Unit Price Items described subsequently herein shall include for each item all excavation (including rock excavation, if any) the removal of existing pavements, curb and gutter, sidewalks, driveways, brush and timber, structures and piping to be relocated or abandoned; also sheeting, diking, well pointing, bailing, dewatering; the furnishing and placing of bulkheads, the restoration of any utilities, parkways, trees, shrubbery, culverts, fences, and other items not covered under subsequent items disturbed by construction operations; backfilling and removal of excess excavated materials; and testing.

The cost of all such work and the cost of other work necessary for the complete water installation not specifically included for payment under the Item of unit price payment Nos. described herein shall be merged with the various unit prices for the Unit Price Construction Items.

1.2 Standards

Where material and methods are indicated in the Specifications as being in conformance with the standard specification, it shall refer in all cases to the latest edition of the specifications and shall include all interim revisions. Listing of a standard specification without further reference indicates that the particular material or method shall conform with such listed specification.

2. WORK INCIDENTAL TO CONSTRUCTION

2.1 Work to be performed under this heading includes all the work designated as "Incidental to Construction" and shall be done in compliance with the Contract Drawings. The Contractor is hereby referred to the Agreement, General and Special Conditions Sections of these Specifications and the Contract Drawings. All work wherein there are not specified pay items shall be considered as "Incidental to Construction" and no additional compensation will be allowed.

2.2 In addition to the above referenced requirements, and unless otherwise noted the below listed work shall be considered incidental to construction.

2.3 Public and Private Utilities

Utilities. Where any utilities, such as water, sewer, telephone, power, oil and gas transmission or any other, either public or private, are encountered, the Contractor shall provide adequate protection for them and will be held responsible for any damage to such utility from his operations. When it is apparent that construction operations may endanger the foundation of any utility conduit, pole, or the support of any structure, the Contractor shall notify the utility owner of this possibility and shall take such steps as may be required to provide temporary bracing or support of conduits, poles, or structures.

The cost of any bracing or support of conduits, poles of structures as shown on the Contract Drawings shall be merged into the unit price per linear foot of water main.

When, in order to carry out the work, a pole (power or telephone) must be removed to a new location or moved and replaced after construction, the Contractor shall arrange for the moving of such pole or poles and lines thereof.

Where it is the policy of any utility owner to make his own repairs to damaged conduit, or other structures, the Contractor shall cooperate to the fullest extent with the utility owner and he shall see that his operations interfere as little as possible with the utility owner's operations.

Existing Water, Sewer and Drain Facilities. In some instances, existing water, sewer, or drains may be encountered along the line of work. In all such cases, the Contractor shall perform his operations in such manner that such service will not be interrupted, and shall, at his own expense, make all temporary provisions to maintain such services.

Where it is necessary to cut, remove and/or replace existing storm sewers and drain tiles, the Contractor shall make specific arrangements to maintain the flow of water and shall not place permanent bulkheads in any conduit. Temporary earth dams may be used to confine and/or channel the flow and shall be removed upon completion of the crossing.

The Contractor shall receive no extra compensation for replacement of drains encountered or for re-laying same at a new grade or line.

Existing Water Facilities. Where existing water mains are encountered in the work they shall be maintained in operation to the extent that water service is not interrupted.

Existing Gas Facilities. Where existing gas mains shown on the Contract Drawings are encountered, the Contractor shall arrange with the gas utility for any necessary re-laying.

The Contractor will give adequate notice to the gas utility to allow their location of gas lines ahead of the proposed construction with paint or stakes. The Contractor will be required to expose the gas mains prior to dynamiting and excavation, where crossing pipeline installations. Track drill operations will be ceased short of the gas main and will resume on the other side of the main. The material under the gas line will be removed with hand drills and/or jack hammers. The selective use of "pop-shooting" with dynamite, which must be strictly controlled by the Contractor, may be allowed only at the discretion of the gas utility. The Contractor shall contact the gas utility for restrictions.

Before backfilling any trench in which a gas main has been exposed, the Contractor shall notify the gas utility to inspect the exposed main and perform any protective measures deemed necessary.

When the proposed construction is completed on a particular street, the Contractor and/or the gas utility will check each particular street with natural gas detectors.

Existing Underground Electric and Telephone Facilities. Where existing underground electric or telephone facilities are encountered, the Contractor shall arrange with the electric company or telephone company for any necessary re-laying.

2.4 Dewatering

The Contractor shall perform all pumping, well pointing, ditching and any other necessary procedure to keep the excavation clear of groundwater, stormwater, or sewage during the progress of the work and until the completed work is safe from injury.

The Contractor shall maintain dewatering operations such that no groundwater, stormwater, or sewage will be allowed to build up over any concrete and/or masonry at manholes or structures for a period of 6 hours. This time period will be adjusted by the Engineer should temperature and curing conditions warrant.

All water pumped or drained from the work shall be disposed of in a manner satisfactory to the Engineer without damage to adjacent property or to other work under construction. The Contractor shall not dispose of storm or surface water through new or existing sanitary sewerage facilities.

It shall be the Contractor's responsibility to take all necessary precautions to protect all construction against flooding and/or flotation from hydrostatic uplift.

All dewatering procedures and maintenance thereof shall be considered an integral part of pipe laying and manhole construction operations and no separate payment will be allowed therefore.

Dewatering operations for structure construction shall be such that the groundwater or surface water is not being pulled over, around, or through the freshly placed concrete or masonry. The use of multiple pumps placed on each side of the manhole and/or at points in the trench down stream might be required. When required to protect the freshly placed concrete and/or masonry, timber or plywood forms will be positioned around the concrete or masonry so that the dewatering operations will not cause a separation of cement and aggregate. The cost of these dewatering and/or protection procedures shall be merged into the appropriate structure bid items.

2.5 Barricades and Warning Signs

The Contractor shall furnish, erect, and maintain such barricades, fences, lights, and danger signals and take other precaution measures that will ensure the protection of persons, property and the work.

2.6 Maintenance and Access of Traffic

Portions of the work are located in developed areas requiring the access for fire and other departments to be provided for and at least one free lane shall be available for all traffic. Contractors are to arrange operations in these areas to meet these requirements and secure approval of operating procedures from Green River Valley Water District, Hart County or Kentucky Department of Highways as the case may be.

Where water mains are constructed under paved roadway surfaces, within public rights-of-way, the Contractor will restore the asphalt or crushed stone pavement and/or shoulders between shoulder lines. It shall be the responsibility of the Contractor, upon completion of the water main installation, to regrade the street with pug mix to the template that existed prior to construction. This regrading shall be satisfactory to Green River Valley Water District, Hart County or Kentucky Department of Highways before the street is released for paving operations.

The Contractor shall further be responsible for the maintenance of disturbed streets until repaving operations have been completed.

The Contractor shall restore all curbs, gutters, sidewalks, ramps and private driveways or parking lots. Compensation for this work is detailed in other portions of this document and any item which must be removed as was evidence and necessary for the installation of the proposed water main, for which there is no specific pay item(s) shall be considered as incidental to the construction of the proposed water main and, therefore, no additional compensation will be allowed for the restoration of this (these) item(s).

The Contractor shall also be required to restore, at his own expense, all pavements disturbed by his operations where the water main was not constructed under the pavements. He shall further be required to replace at his own expense all pavements disturbed in the correction of water main deficiency discovered after restorations have been completed.

3. MATERIAL AND EQUIPMENT

Materials, products and equipment shall be properly containerized, packaged, boxed and protected to prevent damage during transportation and handling. Provide suitable temporary weathertight storage facilities as may be required for materials or equipment which will be damaged by storage in the open. Protect from damage all materials delivered at the site. Do not use damaged material on the work.

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

4. SPECIAL CONDITIONS

The Contractor's attention is called to the special conditions indicated on the Drawings and described in this Section of the Specifications. The Drawings and Specifications reflect the type of construction that is anticipated in the various locations requiring special attention, but it shall be the responsibility of the Contractor to contact the various agencies including the State Highway Department, the gas company, telephone company, railroad company, Corps of Engineers, and other utilities and/or entities involved when working in areas where they will be concerned, and for coordinating construction with their requirements in such a way to avoid conflicts, damage or interruptions in service.

(a) The Contractor shall perform his work in such a manner that normal service on existing water lines and service to customers is maintained to the maximum extent possible. Such service shall be disrupted at such times and in such a manner as approved by the Engineer.

(b) The Contractor shall submit a work schedule to the Engineer for approval prior to beginning work. The schedule shall establish the planned sequence of line installation, service switch-over if required and property restoration for the project.

(c) The Contractor shall maintain access to businesses and residences to the maximum extent possible.

(d) Easement Restrictions - The Contractor upon request will be furnished with plans showing easements obtained for the construction of water mains and appurtenances. The Contractor shall exercise due care in staying within the easement indicated, and will be held strictly accountable for violations thereof. Any desired access points not shown on the Drawings must be acquired by the Contractor by negotiation with the property owner involved.

5. TESTING

The Specifications for materials designate the testing applicable for materials incorporated in the work. Testing shall be done by the manufacturer in accordance with the applicable ASTM specification. Manufacturer shall furnish the Engineer with three (3) certified copies of the test results.

The Owner may, at his option, elect to have an independent testing laboratory test materials to be furnished for incorporation in the work. Such testing, when done, shall be in accordance with provisions of the Specifications for Materials.

Acceptance testing for installed water line will be limited to visual testing and pressure testing unless directed otherwise by the Engineer.

6. SUBMITTALS

Submittals for this work include: pipe supplier with information on pipe to be used including the joint design, recommended laying methods and material test reports; manufacturer's data on valves, valve boxes, fire hydrants, casing pipe and/or tunnel liner plate, and pea gravel to be used. Such submittals are to be made for approval by Engineer prior to incorporation of any materials into the work.

7. TEMPORARY FACILITIES/UTILITIES

Note: Field office for the Contractor is not required on this project.

Contractor shall be required to maintain suitable sanitary facilities for his workers.

8. WARRANTY

The work to be performed under this Contract shall be guaranteed against defects in materials or workmanship for a period of one year following the date of formal acceptance of the project. In the event defects in materials or workmanship should appear, the Contractor shall promptly make the necessary correction. When the defects are not of an emergency nature, the Contractor will be notified and will be given a period of two weeks in which to make the necessary corrections. Should the defect be of an emergency nature which in the opinion of the Owner or the Engineer requires immediate correction, the Contractor will be notified and requested to make the necessary repairs immediately. Should this be impractical, or if the Contractor should fail to respond to the request for corrective action within the specified period, the Owner may proceed to have the defects corrected and shall bill the Contractor for all charges in connection therewith

including labor, materials, and equipment rental. Such charges may be deducted from amounts due the Contractor if any of the Contractor's money has been withheld. In the event the Contractor fails, refuses, or neglects to pay the Owner, the Surety shall be liable for such charges.

9. MAINTENANCE OBLIGATION

The Contractor shall be fully responsible for maintenance of any and all portions of the work which he performs under this Contract for a period of 30 days. This maintenance obligation shall begin upon formal acceptance of the project and is intended to place a limit upon the Contractor's responsibility for normal maintenance required for the routine operation of the system. This 30-day obligation shall not be construed as relieving the Contractor of the responsibility for maintenance or repair work resulting from defective materials or workmanship during the warranty period.

10. PROJECT CLOSE-OUT

The premises and the job site shall be maintained in a reasonably neat and orderly condition and kept free from an accumulation of waste materials and rubbish during the entire construction period. Remove crates, cartons and other flammable waste materials or trash from the work areas at the end of each working day.

When the Contractor requests a Final Inspection, Engineer will inspect the work for completeness in accordance with the Contract Documents. Any deficiencies shall be promptly corrected by the Contractor.

Final acceptance cannot be made until the Contractor furnishes to the Owner a notarized certification in a form suitable to the Owner that all labor and material costs for the work have been paid by the Contractor and that there are no liens against the work.

Payment in full of the Final Application for Payment shall constitute acceptance of the work by the Owner subject to conditions of the Contract Documents.

WATER MAINS AND APPURTENANCES

SECTION 2

MATERIALS

1. GENERAL

All materials to be incorporated in the project shall be first quality, new and undamaged material conforming to all applicable portions of these Specifications.

2. CONCRETE

Cement - Cement shall be Portland cement of a brand approved by the Engineer and shall conform to "Standard Specifications for Portland Cement", Type 1, ASTM Designation C-150, latest revision. Cement shall be furnished in undamaged 94 pound, one cubic foot sacks, and shall show no evidence of lumping.

Concrete Fine Aggregate - Fine aggregate shall be clean, hard uncoated natural sand conforming to ASTM Designation C-33, latest revision, "Standard Specifications for Concrete Aggregate."

Concrete Coarse Aggregate - Coarse aggregate shall consist of clean, hard, dense particles of stone or gravel conforming to ASTM Designation C-33, latest revision, "Standard Specifications for Concrete Aggregate". Aggregate shall be well graded between 1-1/2-inch and #4 sieve sizes.

Water - Water used in mixing concrete shall be clean and free from organic matter, pollutants and other foreign materials.

Ready-Mix Concrete - Ready-mix concrete shall be secured only from a source approved by the Engineer, and shall conform to ASTM Designation C-94, latest revision, "Specifications for Ready-Mix Concrete." Before any concrete is delivered to the job site, the supplier must furnish a statement of the proportions of cement, fine aggregate and coarse aggregate to be used for each mix ordered, and must receive the Engineer's approval of such proportions.

Class "A" Concrete - Class "A" concrete shall have a minimum compressive strength of 4,000 pounds per square inch in 28 days and shall contain not less than 5.5 sacks of cement per cubic yard.

Class "C" Concrete - Class "C" concrete shall have a minimum compressive strength of 2,000 pounds per square inch in 28 days and shall contain no less than 4.5 sacks of cement per cubic yard.

Metal Reinforcing - Reinforcing bars shall be intermediate grade steel conforming to ASTM Designation A-615, latest revision, "Standard Specifications for Billet Steel Bars for Concrete Reinforcement." Bars shall be deformed with a cross-sectional area at all points equal to that of plain bars of equal nominal size.

3. CRUSHED STONE

Crushed stone for pipe bedding shall meet the quality requirements of ASTM D-692 and the grading requirements of AASHTO M-43 for Size 57.

Crushed stone for backfill shall meet the quality requirements of ASTM D-692 and the grading requirements of AASHTO M-43, size 57.

4. DUCTILE IRON PIPE

Ductile iron pipe for water shall be manufactured in accordance with USA Standard A21.51 for centrifugally case ductile iron pipe. The pipe shall be manufactured of iron having acceptance values of 60-42-10. Minimum allowable wall thickness shall be in accordance with the following table. Heavier pipe will be required where designated on the Drawings or required by Section 3 of these Specifications.

Nominal Dia., In.	Minimum Wall Thickness. In.	Minimum Thickness Class
4	0.29	52
6	0.31	52
8	0.33	52
10	0.35	52
12	0.34	50
16	0.37	50

Pipe shall be furnished in lengths of 18 feet to 20 feet and, unless otherwise indicated, shall be provided with a compression type slip joint equal to the Fastite joint as manufactured by American. Gaskets and lubricants shall be furnished with the pipe.

Pipe shall be furnished with standard thickness cement lining on the inside with a bituminous steel coat and a bituminous coating on the outside. Cement lining shall conform to USA Standard A21.4. The exterior of the pipe shall be clearly marked to indicate the manufacturer, date of manufacture, the pipe class and weight. Exterior markings shall also positively identify the pipe as being Ductile Iron.

5. 6" and 8" PVC WATER PIPE

PVC pipe for water shall be manufactured in accordance with ASTM D-2241 and have NSF approval. The pipe shall be Class 200 polyvinyl chloride plastic (PVC 1120) SDR 21. The following tests shall be run for each machine on each size and type of pipe being produced, as specified below:

Flattening Test: Once per shift in accordance with ASTM D-2412. Upon completion of the test, the specimen shall not be split, cracked or broken.

Acetone Test (Extrusion Quality Test): Once per shift in accordance with ASTM D-2152. There shall be no flaking, peeling, cracking, or visible deterioration on the inside or outside surface after completion of the tests.

Quick Burst Test: Once per 24 hours in accordance with ASTM 5199.

SDR	Pressure Rating	Minimum Bursting Pressure, psi
21	200	800

Impact Tests: 6-inch and smaller, once each 2 hours in accordance with ASTM D-2444.

Wall Thickness and Outside Dimensions Test: Once per hour in accordance with ASTM D-2122.

Bell Dimensions Test: Once per hour in accordance with ASTM D-3139.

If any specimen fails to meet any of the above mentioned tests, all pipe of that size and type manufactured between the test period must be scrapped and a full set of tests rerun.

Furnish a certificate from the pipe manufacturer stating that he is fully competent to manufacture PVC pipe of uniform texture and strength and in full compliance with these specifications and further stating that he has manufactured such pipe and done so in sufficient quantities to be certain that it will meet all normal field conditions. In addition, the manufacturer's equipment and quality control facilities must be adequate to ensure that each extrusion of pipe is uniform in texture, dimensions, and strength. Also furnish a certificate from the manufacturer certifying that the pipe furnished for this project meets the requirements of these Specifications.

All pipe shall be manufactured in the United States of America. All pipe for any one project shall be made by the same manufacturer.

The pipe may be furnished in the manufacturer's standard laying lengths of 20 feet. The Contractor's methods of storing and handling the pipe shall be approved by the Engineer. All pipe shall be supported within 5 feet of each end; in between the end supports, there shall be additional supports at least every 5 feet. The pipe shall be stored away from heat or direct sunlight. The practice of stringing pipes out along the proposed water line routes will not be allowed.

Certain information shall be applied to each piece of pipe. At the least, this shall consist of:

Nominal size
Type of material
SDR or class
Manufacturer
NSF Seal of Approval

Pipe that fails to comply with the requirements set forth in these Specifications shall be rejected.

Detectable tape shall be 3 inches wide and shall be an inert, bonded layer plastic with a metalized foil core and shall be highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils. The tape shall be blue in color and shall bear the imprint "CAUTION - WATER LINE BURIED BELOW". This detection tape shall be placed over the water main at a level of 15 inches below the finished ground surface.

NOTE: The Contractor's attention is directed to the requirement of the Owner for the furnishing and installation of #14 insulated copper trace wire for water pipe on this project. This trace wire shall be stubbed up at al valve boxes for use by the Owner.

Prior to ordering water pipe or detectable tape the Contractor shall submit proposed materials to the Engineer for approval.

6. 16" and 12" POLYVINYL CHLORIDE (PVC) PRESSURE WATER MAIN PIPE

16" water mains shall be AWWA C-905 PVC water main pipe (DR-18; 235 PSI; 0.967" Min. Wall; 12" water mains shall be AWWA C-900 PVC water main pipe (DR-18; 235 PSI; 0.733" Min. Wall; w/cast iron pipe equivalent OD's), where designated on the Contract Drawings and in the Bid Proposal shall conform to ANSI / AWWA C-905 manufactured in accordance with ASTM D2241, latest revision. All pipe shall be manufactured from Class 12454-B Polyvinyl chloride plastic (PVC 1120) as defined in ASTM D-1784. The pipe shall have NSF approval. The following test shall be performed for each machine and on each size and type of pipe being produced with test results furnished to the Engineer prior to any pipe being installed.

Flattening Test - Once per shift in accordance with ASTM D-2412. Upon completion of the test, the specimen shall not be split, cracked, or broken.

Acetone Test (Extrusion Quality Test) - Once per shift in accordance with ASTM D-2152. There shall be no flaking, peeling, cracking, or visible deterioration on the inside or outside surface after completion of the tests.

Quick Burst Test - Once per 24 hours in accordance with ASTM 1599.

Wall Thickness and Outside Dimensions Tests - Once per hour in accordance with ASTM D-2122.

Bell Dimension Test - Once per hour in accordance with ASTM D-3139.

In addition to the above, the pipe manufacturer shall furnish a certificate stating that he is fully competent to manufacture PVC pipe of uniform texture and strength and in full compliance with these Specifications and further stating that he has manufactured such pipe and done so in sufficient quantities to be certain that it will meet all normal field conditions. In addition, the manufacturer's equipment and quality control facilities must be adequate to ensure that each extrusion of pipe is uniform in texture, dimensions, and strength. Also furnish a certificate from the manufacturer certifying that the pipe furnished for this project meets the requirements of these Specifications.

All pipe shall be manufactured in the United States of America. All pipe for any one project shall be made by the same manufacturer.

The pipe may be furnished in the manufacturer's standard laying lengths of 20 feet. The Contractor's methods of storing and handling the pipe shall be approved by the Engineer. All pipe shall be supported within 5 feet of each end; in between the end supports, there shall be additional supports at least every 15 feet. The pipe shall be stored away from heat or direct sunlight. The practice of stringing pipes out along the proposed water line routes will not be allowed.

Certain information shall be applied to each piece of pipe. At the least, this shall consist of:

Normal Size
Type of material
DR or class
Manufacturer
NSF Seal of Approval
AWWA C-905

Pipe that fails to comply with the requirements set forth in these Specifications shall be rejected.

Pressure Class at 73.4° shall be 235 PSI (SDR 18), (working pressure 235 PSI). Joints shall be compression type conforming to ASTM D-3139 and F-477 shall be used for 4-inch or larger. All joints shall be designed to withstand the same pressure as required for the pipe.

Furnish detection tape and trace wire as per specifications in this Section.

Fittings for C-905 water main pipe 4-inch through 16-inch shall be compact ductile iron conforming to USA Std. A21.53-84, latest revision. Fittings shall have interior cement lining and exterior coating as specified for ductile iron pipe.

7. FITTINGS

All fittings shall be compact ductile iron, cement lined, bituminous coated, manufactured in accordance with USA Standards A21.53-84, latest revision, unless otherwise indicated or directed. Minimum pressure rating shall be 350 psi. Unless indicated otherwise on the Drawings, mechanical joint fittings shall be used.

Fitting manufacturer shall furnish certificates that fittings were manufactured in compliance with ANSI A21.53-84, latest revision.

NOTE: The Contractor's attention is directed to the requirement for restrained pipe joints in specific locations as shown on the Contract Drawings on this project. All ductile iron pipe joint restraints for pipe segments designated as restrained pipe shall be TR FLEX® as manufactured by U.S. Pipe and Foundry Company or, if available for straight run pipe, Fast-Grip® gaskets as manufactured by American Cast Iron Pipe Company, "Field-Lok" gaskets by U.S. Pipe, or Engineer-approved equal.

Maximum pipe joint deflections for DIP pipe shall be as specified on the Contract Drawings.

NOTE: Restrained joints for PVC pressure pipe, where required on this project, shall be EBAA IRON Series 1100HV Megalug® Harness restraints, or Engineer-approved equal.

Maximum pipe joint deflections for PVC pressure pipe shall be as specified on the Contract Drawings.

8. GATE VALVES

All gate valves shall be iron body bronze mounted, double disc valves with non-rising stems. Valves shall be furnished with mechanical joint ends in accordance with USA Standard A21.11 unless otherwise shown or directed. Valves shall be suitable for installation in approximately vertical position in buried pipe lines. Stem seal shall consist of O-ring seals. All valves shall be open to the left (counterclockwise), and shall be provided with a 2-inch square operating nut. Valve supplier shall furnish two standard stem iron wrenches for turning nut operated valves.

Valves shall be for working pressures up to 200 psi and shall be equal to latest specifications of AWWA C500 in all respects. Valves shall be equal to Mueller A-2380-20, unless shown otherwise on Drawings.

9. RESILIENT SEAT GATE VALVES

Resilient seat gate valves shall be iron body, machined surface, modified wedge disc, resilient rubber seat ring type valves with non-rising stems (NRS). Resilient seat gate valves shall have the bronze stem nut cast integrally with the cast iron valve disc. The valve shall have machined seating surface and capable of being installed and operated in either direction. Valves shall be furnished with mechanical joint ends in accordance with USA Standard A21.11 unless otherwise shown or directed. Valves shall be suitable for installation in approximately vertical position in buried pipe lines. Stem seal shall consist of O-ring seals. All valves shall open to the left (counterclockwise), and shall be provided with a 2-inch square operating nut. All underground gate valves which have nuts deeper than 30 inches below the valve box top shall have extended stems with nuts located within one foot of the valve box cap.

Valves shall be for working pressures up to 200 psi and shall be equal to latest specifications of AWWA C509 in all respects. Valves shall be equal to Mueller A-2370-20, unless shown otherwise on Drawings.

Iron body resilient seat gate valves shall be as manufactured by Mueller, or equal.

10. TAPPING SLEEVES AND VALVES

Tapping sleeves shall consist of a mechanical joint tapping sleeve Mueller H-615, or approved equal, and a valve with mechanical joint outlet Mueller H-667, or approved equal. The valve shall conform to all applicable specifications for gate valves. The Contractor shall provide tapping machine and perform tap for this project.

Valves shall be of similar construction to APCO 200A or approved equal. Inlet size shall be 1 inch in diameter.

11. VALVE BOX FRAMES AND COVERS

Valve box frames and covers shall be made of heavy cast iron and shall meet the requirements of ASTM A-48, Class 30.

All casting shall be made accurately to the required dimensions and shall be sound, smooth, clear and free of blemished or other defects. Defective castings which have been plugged or otherwise treated to remedy defects shall be rejected. Contact surfaces of frames and covers shall be machined so that the covers rest securely in the frames with no rocking or movement. The cover shall be in contact with the frame for the entire perimeter of the contact surface.

The valve box frames and covers shall be as manufactured by John Bouchard and Sons Company, Nashville, Tennessee, No. 8004 Roadway Type, or approved equal. The cover shall be marked "WATER".

A minimum 2-foot diameter concrete collar shall be placed around the top of the valve box in non-paved areas to provide support of the box. The collar shall be a minimum of 4 inches thick and sloped to drain away from the box (see the Standard Detail for Gate Valve on Drawings).

12. SERVICE CLAMPS

Where designated on the Drawings or required by the Engineer, service clamps shall be used for all taps made to the water line. Service clamps shall be all bronze construction with neoprene gasket.

13. PIPELINE DETECTION TAPE

Detectable pipeline location tape shall be plastic composition film containing one layer of metalized foil laminated between two layers of inert plastic film specifically formulated for prolonged use underground. Tape shall be minimum 5.5 mils thickness, blue in color, and continuously printed in permanent ink to indicate caution for a buried water main. This detection tape shall be placed over the water main at a level of 15 inches below the finished ground surface.

Tape shall be a minimum of 3 inches in width with a minimum tensile strength of 5,000 psi. Tape shall be Terra-Tape as manufactured by Reef Industries, Inc., or approved equal.

In addition to detectable tape described above, a tracer wire shall also be installed by taping to the top of the water main. This tracer wire shall be #14 copper wire. All splices shall be by the solder or compression fitting methods. Wire nuts are not permitted.

14. TRACER WIRE

The tracer wire shall also be installed by taping to the top of the water main. This tracer wire shall be 14-gauge insulated copper wire. All splices shall be by the solder or compression fitting methods. Wire nuts are not permitted.

15. SERVICE LINE ITEMS

Service lines shall consist of a corporation cock, bronze service clamp as per Contract Drawings, 3/4-inch SDR 9; Cl. 200 3408 P.E. tubing, curb stop, meter box and meter as described herein or shown on the Contract Drawings.

Bronze fittings shall be Mueller as indicated or approved equal.

16. FIRE HYDRANTS

Fire hydrants shall be iron bodied, fully bronze mounted hydrants manufactured to equal or exceed AWWA Specification C502 latest revision. Hydrants shall be suitable for 150 psi working pressure and shall be subjected to a test pressure of 300 psi. Inlet connection shall be 6-inch mechanical joint unless noted otherwise on Drawings. Main hydrant valve shall be compression type, closing with the pressure, with 5¼-inch valve opening.

All hydrants shall be equipped with two 2½-inch hose nozzles, one 4½-inch pumper nozzle, breakable safety flange and safety stem coupling. Bronze nozzles shall be securely locked to prevent them from blowing off. Hose threads and pumper nozzle threads shall be National Standard. Nozzle caps shall be equipped with non-kink chains.

Hydrants shall be of the "dry head" type with an oil reservoir and provision for automatic lubrication of stem threads and bearing surfaces each time the hydrant is operated. Double O-ring seals shall be provided to keep water out of the hydrant top. Operating nut shall be 1½-inch pentagon, opening to left, and shall be equipped with a weather cap.

Hydrants shall be provided with automatic multiport drain ports arranged to momentarily flush water pressure each time hydrant is operated. A positive stop shall be provided on the operating stem to prevent over travel when operating valve.

Fire hydrant shall be supplied with a bituminous coating for buried portion of hydrant and a red enamel finish for above ground portions of the hydrant. Hydrants shall be equal to Mueller A-423 unless shown otherwise on the Drawings.

Minimum bury shall be 36 inches.

Fire hydrant manufacturer shall furnish certificates that all fire hydrants were tested and manufactured in compliance with AWWA C502 in all respects.

Locking tees shall be used at all locations where possible. At all other locations restrained joints shall be used.

17. RIP-RAP

Rip-rap stone material shall be sound, durable, free from cracks, pyrite intrusion and other structural defects. Wear shall not exceed sixty by the Los Angeles Method. When crushed aggregate is subjected to five alternations of the sodium sulfate soundness test, the weighted percentage of loss shall not be more than fifteen. At least 90 percent of the stone shall not be less than 8 inches wide by 12 inches long by 12 inches deep and shall be approximately rectangular in shape.

18. CASING PIPE

Where noted on the Drawings or required by these Specifications, roadway, railroad or other crossings shall be made utilizing carrier pipe within a casing pipe. Sizes of carrier pipe and casing pipe shall be as noted on the Drawings or described in these Specifications. Casing pipe and joints shall be of leak proof construction. The steel casing pipe shall have a minimum yield strength of 35,000 psi and shall have the minimum wall thickness shown in the following table or as shown on the Drawings.

The minimum size of the steel casing pipe shall be large enough to allow the use of casing chocks described below. The Contractor may utilize a larger casing pipe size, if desired, as long as the carrier is properly secured to the satisfaction of the Owner / Engineer.

TABLE OF MINIMUM WALL THICKNESS FOR STEEL CASING PIPE
(COOPER E-80 LOADING)

Casing Diameter, inches	Wall Thickness with approved protective coating, inches	Wall Thickness without approved protective coating, inches
Under 14	0.188	0.251
14 & 16	0.219	0.282
18	0.250	0.313
20	0.281	0.344
22	0.312	0.375
24	0.344	0.407
26	0.375	0.438
30	0.406	0.469
36	0.469	0.532
42	0.500	0.563

Casing shall extend to the points indicated on the Drawings.

Note: In situations where the bore method is utilized with a steel casing pipe, the carrier pipe shall be secured inside the steel casing pipe with casing chocks (minimum three per joint) as manufactured by Powerseal Pipeline Products Corporation of Wichita Falls, Texas, or Engineer approved equal. Where casing chocks are used inside steel casing pipes, the requirement for sand or pea gravel backfill can be eliminated. Additionally, the ends of the steel casing pipe shall be sealed with casing pipe "End Seals", "Link-seal", or Engineer approved equal.

CSX Railroad does not require vents on casings with water mains.

19. VALVE MARKERS

Where indicated on the Contract Drawings, markers for valves shall be one piece for driving or settling in the ground. Marker units shall be weather resistant with identifying color and permanently affixed marker identifying Water Main Valve and shall be a minimum of 62 inches in length. Units shall be flexible and resistant to damage by vehicles, animals, or vandals. Marker units shall be Carsonite Utility Marker, manufactured by Carsonite International, Carson City, Nevada, or approved equal.

20. AIR RELEASE VALVE

See standard details on the Contract Drawings

WATER MAINS AND APPURTENANCES

SECTION 3

CONSTRUCTION

1. PRELIMINARY WORK

1.1 Location of Lines - The streets, roads and easements in which lines shall be placed have been indicated on the Drawings. Final location of the pipe lines within these locations shall be made by the Engineer at the time of construction.

1.2 Location and Protection of Underground Utilities - Prior to trenching, the Contractor shall determine, insofar as possible, the actual location of all under ground utilities in the vicinity of this operation and shall clearly mark their locations so that they may be avoided by equipment operators. Where such utility lines or services appear to lie in the path of construction they shall be uncovered in advance to determine the exact location and depth and to avoid damage due to trenching operations. Existing facilities shall be protected during construction or removed and replaced in equal condition, as necessary.

Should any existing utility line or service be damaged during, or as a result of the Contractor's operations, the Contractor shall take such emergency measures as may be necessary to minimize damage and shall immediately notify the utility involved. The Contractor shall then repair the damage to the satisfaction of the utility or shall pay the utility for making the repairs. In all cases, the restoration and/or repair shall be such that the damaged structure will be in as good or better condition as before the damage occurred.

1.3 Removal of Obstructions - The Contractor shall be responsible for the removal, safeguarding and replacement of fences, walls, structures, culverts, street signs, billboards, shrubs, mailboxes, or other obstructions which must be moved to facilitate construction. Such obstructions must be restored to at least their original condition.

1.4 Clearing and Grubbing - The Contractor shall be responsible for cutting, removing and disposing of all trees, brush, stumps, roots and weeds within the construction area. Disposal shall be by means of chippers, landfills, or other approved method and not in conflict with state or local ordinances.

Care shall be taken to avoid unnecessary cutting or damage to trees not in the construction area. The Contractor will be responsible for loss or damage to trees outside the permanent easement or rights-of-way.

2. EXCAVATION

2.1 General - The Contractor shall perform all required excavation and backfilling incidental to the installation of the water lines, air release valve installations, and other appurtenances under this Contract. Excavation shall be carried to the depths indicated on the Drawings or as necessary to permit the installation of pipe, bedding, structures or appurtenances. Care shall be taken to provide a firm, undisturbed, uniform surface in the bottoms of trenches and excavations for structures.

Where the excavation exceeds the required depth, the Contractor shall bring the excavation to proper grade through the use of an approved incompressible backfill material (generally crushed stone or fill concrete, depending upon the nature of the facility to be placed thereon). In the event unstable soil conditions are encountered at

the bottom of the excavation, the Engineer may direct the Contractor to continue the excavation to firm soil or to provide pilings or other suitable special foundations.

The Contractor shall take such precautions as may be necessary to avoid endangering personnel, pavement, adjacent utilities or structures through cave-ins, slides, settlement or other soil disturbance resulting from his operations.

The Contractor shall saw-cut pavements prior to excavation procedures.

The Contractor shall be responsible for storage of excavated material, disposal of surplus excavated material, trench dewatering and other operations incidental to excavation and backfilling operations.

2.2 Classification of Excavation - Excavation shall be unclassified and the cost of excavation shall be merged into the price per foot for the water main. No distinction will be made between rock and earth excavation and no separate payment will be allowed thereof.

2.3 Pavement Removal - Where existing paved streets, roads, parking lots, drives or sidewalks must be disturbed during construction of the project the Contractor shall take the necessary steps to minimize damage. Permanent type pavement shall be cut or sawed in a straight line before removal and care shall be taken during excavation to avoid damage to adjacent pavement. Where trucks or other heavy equipment must cross curbs or sidewalks, such areas shall be suitably protected.

2.4 Trench Excavation - Trenches shall be excavated in a neat and workmanlike manner, maintaining proper alignment except where necessary to make deviations to miss obstructions. Trenching for installation of water distribution piping shall be such that the pipe will have a minimum cover of 48 inches for 12-inch to 16-inch water mains and 30 inches for 10-inch and smaller water mains except as noted on Drawings. The bottom of trenches must be shaped by hand and bell holes must be dug so that full length of pipe is resting on trench bottom. Blocking shall not be used.

Note: In many cases the water main shall be required to have more than 48 or 30 inches of cover to get under existing utilities or to satisfy other requirements. This additional depth, when required, shall be merged into the unit price bid per foot of water main.

Trenches shall be opened up far enough ahead of pipe laying to reveal obstructions, but in general shall not include more than 300 feet of continuous open trench at any time. The Contractor will be required to follow up trenching operations promptly with pipe laying, backfill and clean-up, and in event of failure to do so, may be prohibited from opening additional trench until such work is completed.

The Contractor shall plan his operations so as to cause a minimum of inconvenience to property owners and to traffic. No road, street or alley may be closed unless absolutely necessary, and then only if the following conditions are met:

1. Permit is secured from appropriate, State, County or Municipal authorities having jurisdiction.
2. Fire and Police Departments are notified before road is closed.
3. Suitable detours are provided and are clearly marked.

No driveways shall be cut or blocked without first notifying the occupants of the property. Every effort shall be made to schedule the blocking of drives to suit to occupants' convenience and, except in case of emergency, drives shall not be blocked for a period of more than 8 hours.

The Contractor shall furnish and maintain barricades, signs, flashing lights, and other warning devices as necessary for the protection of public safety. Flagman shall be provided as required on heavily traveled streets to avoid traffic jams or accidents.

Trench width shall be held to a minimum consistent with proper working space for assembly of pipe. Maximum trench width up to a point one foot above top of pipe shall be limited to the outside pipe diameter plus 16 inches. Boulders, large stone, shale and rock shall be removed to provide clearance of 6 inches below and on each side of the pipe. Trench walls shall be kept as nearly vertical as possible with due consideration to soil conditions encountered and, when necessary, sheeting or bracing shall be provided to protect life and property.

Where unstable soil conditions are encountered at the trench bottom, the Contractor shall remove such additional material as may be directed by the Engineer and replace the excavated material with approved backfill.

The Contractor shall excavate by hand wherever necessary to protect existing structures or utilities from damage or to prevent overdepth excavation in the trench subgrade.

Excavated material shall be stored safely away from the edge of trench and in such a way as to avoid encroachment of private property.

2.5 Excavation for Structures - Excavation for air release valve installations, metering pits or other appurtenance shall be only as large as may be required for the structure of appurtenance and for working room around the same. In earth, excavation shall generally extend to the outer limits of the structure at the bottom, and shall slope outward at such angle as may be required for stability of excavated face. In rock, excavation shall be carried to a point 6 inches outside the structure so that no rock is left within 6 inches of the finished structure or appurtenance.

Care shall be taken as the excavation approaches the desired grade to avoid overdepth excavation and provide a firm and undisturbed soil surface on which footings, slabs or foundations are to be placed. Should the Contractor excavate below the desired grade level, the excavation shall be brought to grade by the use of Class C concrete at the expense of the Contractor. The use of tamped earth backfill under foundations, footings, or slabs will not be acceptable.

Where structures rest partially upon rock, the rock shall be excavated to a point 6 inches below bottom of structure and compacted crushed stone shall be used to bring the excavation back to grade. Where the structure will rest completely on sound solid rock, the rock shall be excavated to a point 4 inches below bottom of structure and compacted crushed stone shall be used to bring the excavation back to grade.

Should the material found at the desired subgrade appear to be unstable or otherwise unsuitable for support of the structure, such condition shall be immediately called to the attention of the Engineer. The Engineer may direct that such unsuitable material be removed and replaced with concrete, he may modify the foundation design to suit the condition, or he may determine that the bearing capacity of the material for the load to be supported; but in any case shall provide written instructions to the Contractor as to the procedure to be followed.

2.6 Rock Excavation - Rock excavation shall consist of loosening, removing and disposing of all rock larger than 9 cubic feet in volume, which in the opinion of the Engineer can only be removed by blasting or other equivalent methods. Such materials to be classified as solid rock shall include boulders, bed rock, or solid concrete but shall not include pavement or shaley materials that can be loosened by other methods.

Where rock excavation is encountered in trenches the excavation shall be carried to a depth of 6 inches below the bottom of the pipe. The rock shall also be removed to a width of at least 6 inches beyond the outside of the pipe on each side so that no rock is left within 6 inches of the outside wall of the pipe. Where rock is excavated in the bottom of the trench, the trench shall be brought back to grade by the use of crushed stone which shall be compacted to form a stable base for the pipe laying operation.

The Contractor shall exercise all necessary precautions in blasting operations. Suitable blasting mats shall be provided and utilized as required. Blasting shall be done only by experienced men. Careless shooting, resulting in the ejection of stones or other debris during blasting, shall be corrected immediately by the Contractor's representative.

No blasting shall be done unless the Contractor shall have taken out the necessary insurance to fully protect the Owner from all possible damages resulting from the blasting operations. The blasting shall be done in accordance with all recognized safety precautions and in accordance with regulations of authorities having jurisdiction. In addition the Contractor shall exercise the necessary care to safeguard the stores of blasting materials on the property.

Where rock is encountered in the immediate vicinity of gas mains, telephone cables, building footings, gasoline tanks, or other hazardous areas the Contractor shall remove the rock in a manner that will ensure protection of these structures. Care shall be taken in blasting operations to see that pipe or other structures previously installed are not damaged by blasting. In general, blasting shall not be done within 25 feet of the completed pipeline or any existing structure.

All excavation on this project is on an unclassified basis. Rock excavation is not a separate pay item.

2.7 Disposal of Surplus Excavated Material - Excavated material that is unsuitable or unnecessary for backfilling shall be hauled to sites as directed by the Engineer for use as fill on the project. No surplus excavated material may be disposed of except as provided herein unless specifically authorized by the Engineer. Any material which is not suitable or not required for the fill on the project shall be disposed of by the Contractor.

2.8 Subsurface Obstructions - In excavating, backfilling, and laying pipe, care must be taken not to remove, disturb or injure other pipes, conduits, or structures, without the approval of the Engineer. If necessary, the Contractor, at his own expense, shall sling, shore up and maintain such structures in operation, and within a reasonable time shall repair any damage done thereto. Repairs to these facilities shall be made to the satisfaction of the Engineer.

The Contractor shall give sufficient notice to the interested utility of his intention to remove or disturb any other pipe, conduit, etc. and shall abide by their regulations governing such work. In the event subsurface structures are broken or damaged in the prosecution of the work, the Contractor shall immediately notify the proper authorities and shall be responsible for any damage to persons or property caused by such breaks.

When pipes or conduits providing service to adjoining buildings are broken during the progress of the work. the Contractor shall have them repaired at once. Delays, such as would result in buildings being without service overnight or for needlessly long periods during the day, will not be tolerated, and the Owner reserves the right to make repairs at the Contractor's expense without prior notification. Should it become necessary to move the position of a pipe, conduit, or structure, it shall be done by the Contractor in strict accordance with instructions given by the Engineer or the utility involved.

The Owner or Engineer will not be liable for any claim made by the Contractor based on underground obstructions being different than that indicated on the Drawings. Where ordered by the Engineer, the Contractor shall uncover subsurface obstructions in advance of construction so that the method of avoiding same may be deter mined before pipe laying reaches the obstructions.

The Contractor shall be governed by instructions of the Engineer regarding the laying of pipe along State Highways and the latter will determine whether the pipe shall be laid over, under, or along the end of various drainage structures encountered.

2.9 Special Conditions - Special care must be exercised in excavation under or near State Highways, railroads, or other areas as designated on the Drawings in order to avoid or minimize delays or injuries resulting there from. Where it is necessary to cross beneath state highways, railroads, or other designated areas, the Contractor shall make such installations as shown on the Drawings and/or as directed in Section 6 - Special Construction Items.

3. INSTALLATION OF WATER LINE AND APPURTENANCES

3.1 General - The Contractor shall use only experienced men in the final assembly of pipe in the trench, and all pipe shall be laid in accordance with these Specifications and the recommended practice of the pipe manufacturer. Trench bottoms shall be carefully prepared and shall be free of water.

Care shall be exercised to ensure that pipe of the proper strength or classification meeting the specifications in every respect is provided at the site of pipe laying operations. Recommended tools, equipment, lubricant and other accessories needed for proper assembly or installation of the pipe shall be provided at the site of the work. Any damaged or defective pipe discovered during the pipe laying operations shall be discarded and removed from the site of the pipe laying operations.

The Contractor shall exercise care in the storage and handling of pipe, both on the storage yard and at the site of laying operations. Suitable clamps, slings, or other lifting devices shall be provided for handling pipe and fittings. Pipe and fittings shall be carefully lowered into the trench piece by piece. Pipe and fittings shall be carefully inspected for defects and for dirt or other foreign material immediately before placing them in the trench. Suitable swabs shall be available at the site of laying operations, and any dirt or foreign material shall be removed from the pipe before it is lowered into the trench.

Bell holes for bell and spigot and mechanical joint pipe shall be dug in trench to allow entire length of pipe barrel to be bedded and to allow proper jointing of pipe. Alignment of pipe shall be as true as possible in order to avoid air pockets. When work is suspended either for the night or for any other reason, open ends of the pipe shall be securely plugged to prevent the entrance of foreign materials. Dead ends of the pipe and unused branches of crosses, tees, valves, etc. shall be closed with plugs suitable to the type of pipe in use.

Dead ends of the pipe and unused branches of crosses, tees, valves, etc. shall be closed with plugs suitable to the type of pipe in use.

Cutting of pipe shall be done in a neat, workmanlike manner without damage to pipe, coatings and linings and so that a smooth end remains at right angles to axis of pipe.

3.2 Removal of Water - The Contractor shall be responsible for handling run-off, ground water, and sewage in such a way as to maintain trenches and excavations in a dry condition until the work is completed. Pumps, piping, well points, labor, fuel, and other facilities necessary to control, intercept, remove and/or dispose of water shall be provided by the Contractor at his own expense. Water removed from trenches or holes shall be discharged to natural drains in such a way as to avoid danger or damage to adjacent property owners or sewers. No pipe shall be laid with water in the bells.

Where the Contractor fails, refuses, or neglects to control water in trenches or other excavations, and corrective work is deemed by the Engineer to be necessary as a consequence thereof, such work shall be at the Contractor's expense.

3.3 Ductile Iron Pipe - Provision of AWWA Specifications C600, latest revision, "AWWA Standard for Installation of Gray and Ductile Cast Iron Water Mains" shall apply. Laying conditions shall be Type 2 (flat bottom trench without blocks) with tamped backfill.

Joints shall be an approved slip-on type or mechanical joint. Unless otherwise indicated on Drawings, lines laid below ground shall have approved slip-on joints, lines laid above ground shall have mechanical joints. Flanged joints shall be used only where designated on Drawings. Cement joints will not be permitted.

Mechanical joint and slip-on type or mechanical joint. Unless otherwise indicated on Drawings, lines laid below ground shall have approved slip-on joints; lines laid above ground shall have mechanical joints. Flanged joints shall be used only where designated on Drawings. Cement joints will not be permitted.

Mechanical joint and slip-on type water line shall be jointed together in trench according to recommendations of pipe manufacturer. Inside of bell and outside of spigot end shall be thoroughly cleaned to remove oil, grit, excess coating and other foreign matter. Circular rubber gasket shall be flexed inward and inserted in gasket recess of bell socket. Thin film of gasket lubricant shall be applied to inside surface of gasket or spigot end of pipe or both. Gasket lubricant shall be as supplied by pipe manufacturer and approved by Engineer. Spigot end of pipe shall be inserted into socket, with care used to keep joint end to bottom of socket with forked tool, jack-type tool, or other device approved by Engineer. Pipe not furnished with depth mark shall be marked before assembly to assure that spigot and is inserted to full depth of joint. Field cut pipe lengths shall be filled or ground to resemble spigot end as manufactured.

Whenever it is desirable to deflect slip-on joint pipe in order to form long-radius curve, amount of deflection shall not to exceed maximum limits as follows:

Diameter	Joint Length	Deflection
4" thru 12"	18 ft.	18 in.
14" thru 30"	18 ft.	10 in.

3.4 Polyvinyl Chloride Pipe - Installation of polyvinyl chloride pipe shall conform to ASTM 2321 and AWWA C900, latest revision. Pipe shall be bedded in compacted granular material to centerline of pipe and compacted granular material to a point 8 inches over pipe. Type 5 Trench Condition as set forth in AWWA C600-87. The bedding material shall be shaped to provide continuous support for the PVC pipe throughout its length except at bells. Blocking shall not be used to bring the pipe to grade.

Whenever it is necessary to cut a joint of pipe in order to fit the trench conditions, the cutting may be made with either hand or mechanical saws or plastic pipe cutters. The cut shall be square and perpendicular to the pipe axis. The cut end shall be beveled as specified by the pipe manufacturer.

Assemble all joints in accordance with recommendations of the manufacturer.

Note: For installation of PVC water main materials, the Contractor shall provide and install 3-inch detection tape as per specifications. This detection tape shall be placed over the newly installed water main at a level of 15 inches below the finish ground surface.

Additionally, the Contractor shall provide and install a 14-gauge insulated copper wire directly on top of the newly installed water main. This copper wire shall be stubbed up into each valve box along the water main alignment. This stub-up shall be suitably secured in the valve box to be readily attached to pipe-locating equipment. Any splices of this wire shall be performed in a manner approved by the Engineer.

3.5 Installation of Fittings - Fittings in pipe lines shall be firmly secured to prevent the fitting from being blown off the line when under pressure. When connections are made between the new work and existing mains, the connections shall be made using specials and fittings to suit the actual conditions.

All tees, caps, plugs, bends or other fittings subjected to unbalanced forces tending to pull the joints apart shall be protected with concrete thrust blocks. Thrust blocks shall be provided in accordance with details shown on Drawings and must bear against an undisturbed trench face. Thrust blocks must be used unless written permission is obtained from the Engineer to use special locked-joint fittings, anchoring fittings, or pipe clamps with tie rods.

Fittings shall be placed in locations indicated on Drawings or designated by Engineer and shall be in stalled in accordance with provisions of these Specifications dealing with laying of Ductile Iron Pipe. Joints shall be as designated under Section 2, Materials.

Before being placed in trench, all fittings shall be subjected to inspection by Engineer; and any defective, unsound or damaged fittings shall be rejected and Contractor shall remove at once from work area.

3.6 Installation of Valves, Valve Boxes - Valves shall be placed in the locations indicated on the Drawings or at locations designated by the Engineer. All valves shall be set vertically. Before being placed in the trench, all valves shall be carefully examined by the Contractor and Engineer to see that they are in good working order.

Over each valve shall be placed a valve box. All valves which, when properly set, have operating nuts deeper than 30 inches below the top of the valve box shall have extension stems with operating nuts located within one foot of the valve box cap.

See Special Detail on Contract Drawings concerning the pipeline trace wire stub-ups at all valve boxes.

The valve box shall not come in contact with valve, valve stem, extension, or operating nut at any point. Backfill around boxes shall be tamped to maintain centered and plumbed alignment of box.

Box shall be installed with top set flush with finished surface in paved areas and to 2 inches above natural ground level in unpaved areas.

Upon completion of project, the Contractor shall operate all buried valves in the presence of the Engineer to verify proper operation.

3.7 Installation of Fire Hydrants - Hydrants shall be located generally as shown on the Drawings subject to review and approval by the Fire Department. Location shall provide complete accessibility and minimize possibility of damage from vehicles or injury to pedestrians.

Hydrants shall stand plumb (vertically) with pump nozzle facing street or public rights-of-way. Hydrants shall be set so that groundline, as indicated on hydrant barrel, is within 4 inches of finished grade. Hydrants with out ground lines marked on barrel shall be set so that barrel flange is no more than 2 inches below finished grade. Hydrant barrels shall be minimum bury of 36 inches. Greater bury depths might be required to accomplish the above described grade setting. It is desired to accomplish the proper grade setting without the use of barrel extensions. All cost for barrel extensions and greater depth of bury shall be included in the unit price bid for the fire hydrant assemblies.

A hydrant drain consisting of at least 7 cubic feet of clean, washed gravel or crushed stone shall be placed around base of hydrant. After installation is complete, hydrant will be tested for drainage and Contractor must correct situation if hydrant does not drain satisfactorily.

Concrete thrust block shall be poured at base of hydrant with care taken not to plug hydrant drains. Blocks must be poured in addition to retained glands, locked joint base fittings, anchoring fittings, or pipe clamps and tie rods.

Painting of hydrants after installation shall be required if factory finish is not satisfactory or has been damaged. All hydrants shall be red unless otherwise directed by the Engineer.

In case of damaged or otherwise unsatisfactory paint, Contractor shall apply two (2) coats of approved enamel.

Hydrant installation shall conform to details in Contract Drawings.

4. BACKFILL

4.1 General - Backfilling shall be carried out as expeditiously as possible, but shall not be undertaken until the Engineer has been given the opportunity to inspect the work. The Contractor must carry out all backfilling operations with due regard to: the protection of pipes, structures and appurtenances; the use of prescribed backfill materials; and procedures to obtain the desired degree of compaction. No equipment may be used which will result in damage to or misalignment of the pipe.

4.2 Acceptable Backfill Material - All backfill material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks or stones, or other material that in the opinion of the Engineer is unsuitable. From one foot above top of pipe to within twelve inches of finished grade in unpaved areas, back fill may contain stones up to six inches in their greatest dimension, unless otherwise specified. Backfill containing rock must contain enough dirt to fill voids between rock.

When backfill material is not specified on Project Drawings or elsewhere in these Specifications, Contractor may backfill with the excavated material provided material consists of loam, clay, sand, gravel, or other materials that, in opinion of Engineer, are suitable for backfilling.

Backfilling shall not be done in freezing weather and it shall not be made with frozen material. No fill shall be made where material already in trench is frozen. Backfill shall not be made with material which, in Engineer's opinion, is too wet.

Where crushed stone backfill is required the crushed stone shall be No. 57 size as designated by the Kentucky Department of Highways Standards for crushed stone used in road surfacing.

Select Excavated Material for use as pipe bedding and envelope from 12 inches under the pipe to a point 12 inches above the pipe in outside roadway areas shall be identified as select clay soil material excavated from the trench, or select tailings from a rock trencher, or select material brought in from off-site, provided all such materials are free of deleterious substances such as rocks (larger than 1-½ inches), roots, stumps, humus material, frozen earth, other organic material and any other objectionable material around the pipe. The envelope shall be placed and compacted around the pipe as set forth in Paragraph 3.4 for Type 5 Trench Condition for PVC pipe in accordance with AWWA-C-600-87. Consolidation by jetting will not be allowed. The furnishing and installation of the select material bedding and select material envelope shall be considered as an integral part of the job and its cost merged into the unit price bid for water main pipe. No separate payment shall be allowed.

4.3 Backfilling Under Pipe - All trenches shall be backfilled by hand from bottom of trench to centerline of pipe. Approved backfill material (Select Excavated Material or Crushed Stone No. 57) shall be placed in 6-inch layers and thoroughly compacted by hand tamping. Backfill material shall be deposited in trench for its full width on each side of pipe, fittings and appurtenances simultaneously. Care must be taken to compact fill along sides of pipe and appurtenances adjacent to pipe wall.

4.4 Backfilling Under Pipe in Rock - Where trench is excavated in rock or shale, a 6-inch space below pipe shall be backfilled with approved bedding material (Select Excavated Material or Crushed Stone No. 57) firmly compacted to form a cushion for pipe and appurtenances.

4.5 Backfilling Over Pipe - From centerline of pipe, fittings and appurtenances to a depth of 1 foot above top of pipe, trench shall be backfilled by hand or by approved mechanical methods of 6-inch layers and thoroughly compacted by hand tamping or by approved mechanical methods. Contractor shall use special care in placing this portion of backfill in order to avoid injuring or moving pipe.

After the backfill has been placed to a depth of at least 12 inches above top of pipe, additional backfill may be placed by means of front end loaders, bulldozers or other suitable mechanical equipment subject to a 9-inch limitation of maximum thickness of layers placed before compaction.

4.6 In Areas Subject to Vehicular Traffic or Under Sidewalks - Where excavation is made through pavement, curbs, driveways, sidewalks, road shoulders, or other areas subject to vehicular traffic or supporting permanent structures or where such areas, items or structures are undercut by excavation, entire backfill shall be crushed stone (No. 57) which shall be placed in layers or lifts not exceeding 9 inches in thickness.

After placing in layers, crushed stone shall be carefully compacted to maximum density or minimum volume. Such backfill, placed where called for on the Drawings or as directed by the Engineer, shall be designated as Crushed Stone Backfill.

Where excavation is made through permanent pavements, backfill shall be placed as described above to subgrade elevation only. Remainder of backfill shall be crushed stone placed as directed to finished pavement grade to serve as temporary pavement.

The last 8 to10 inches of backfill shall be compacted pug mix to stabilize trench cut.

From time that backfilling is complete until time permanent pavement surface is replaced or, in absence of pavement replacement, until job is accepted, the Contractor shall, at direction of the Engineer, water streets, roads, etc. to settle dust where excessive dust has, in opinion of the Engineer, been caused by the Contractor's operations. If the Contractor refuses or delays unnecessarily to obey direction of the Engineer, the Owner shall, after 24 hours written notice through the Engineer, be permitted to proceed with such work with cost to be billed to the Contractor.

The Contractor's attention is directed to the fact that water main items on this project are established as "under" and "outside" of roadway. Therefore, crushed stone backfill for pipe indicated to be under roadway shall not be a separate pay item.

In Areas Not Subject to Vehicular Traffic - Where excavation is made in areas not subject to vehicular traffic or supporting permanent structures and where settlement is not as critical, the Contractor may backfill trench from 1 foot above top of pipe to top of trench with approved excavated material using hand or approved methods. Backfill material shall be brought up to the original ground level in layers and walked in with suitable equipment. More restrictive compaction of this backfill material will not be required, however, the Contractor shall be responsible for bringing in such additional fill material as may be required from time to time during the one year warranty period to fill in areas where excessive settlement has occurred.

5. COMPLETING INSTALLATION OF LINES, STRUCTURES, ETC.

5.1 General - The Contractor shall not, without the permission of the Engineer, remove from the line of work any earth excavated therefrom which may be suitable for backfilling or surfacing until the excavation has been refilled and surfaced.

As soon as the backfilling of any excavation is completed and when in areas of existing development, the Contractor must at once begin the removal of all surplus dirt except that actually necessary to provide for the settlement of the fill. He shall also remove all the pipe and other material placed or left on the street by him except material needed for the replacement of paving, and the street shall be opened up and made passable for traffic. Following the above work, the repairing and complete restoration of the street surfaces, bridges, crossings, and all places affected by the work shall be done as promptly as possible.

All excavated material shall be cleared from adjacent street surfaces, gutters, sidewalks, parkways, railroads, grass plots, yards, etc., and the whole work shall be left in tidy and acceptable condition. Contractor will be required to regrass lawns or neutral grounds where trenches are excavated in these locations or where Contractor has damaged lawns or neutral grounds by his operations.

The Engineer shall be sole authority in determining time in which rough and final clean-up shall be prosecuted. Rough clean-up shall consist of removal of large rocks, grading of excess backfill material over pipe line or removal of said material, opening of any drainage device, restoration of any street or roadway to condition so that traffic may safely and conveniently use street or roadway, restoration of pedestrian ways to condition where pedestrians may safely and conveniently use same. Rough clean-up shall, in general, be prosecuted no later than 1 day after pipe laying and backfilling or no farther behind pipe laying operations than 1,000 feet; whichever time limit is shortest shall govern. Final clean-up consisting of pavement replacement, sidewalk replacement, removal of rocks, handraking with seeding, strawing, etc., of lawns and neutral grounds, adjusting grade of ground over pipeline, property repairs, and other items shall be prosecuted as soon as is practical after pipe has been laid and backfilled. In general, this would be no later than 2 to 3 weeks after completion of backfilling.

5.2 Final Grading and Seeding - Final clean-up shall consist of, among other items, final grading of disturbed areas and seeding of areas where grass growth was damaged or destroyed by the Contractor's operation. In areas of established lawns no rock shall be left in the top 6 inches of soil and the finished grade shall be that which existed before construction began. In all cases, lawn areas shall be left neat and in a condition so that hand mowing is as easy and convenient as before construction began. The lawn areas and other areas disturbed by the Contractor's activities shall have ground cover restored at least equal to the condition which existed before construction began. In established lawn areas new grass shall be of the same type as originally present. Grass and other ground cover shall be properly applied, fertilized, strawed, and watered as necessary and required to establish a good stand of grass.

5.3 Pavement types shall be designated by Engineer for installation in specific location where such designation is not shown on Drawings. All street pavements, unless otherwise noted herein or directed by the Engineer, which have water mains installed parallel with the road, across streets, driveways or parking lots, shall be restored by the following:

The Contractor shall be responsible for replacing all crushed stone surfacing damaged by his operation with measurement and payment to be described in these Specifications. The Contractor shall be responsible for maintaining temporary patches during construction and shall promptly repair any defects. Upon completion of the work, the paved surfaces shall be left in as good or better condition than before the start of construction.

5.4 Sodding or Sprigging - Where shown on the Drawings or directed by the Engineer, the Contractor shall install sodding or sprigging in lieu of seeding in order to establish ground cover. Normally this would be done in areas subject to erosion in soils that are difficult to hold.

Such sodding or sprigging when authorized by the Engineer as a necessary part of the work and not elected to be used by the Contractor in lieu of seeding shall be a separate pay item if identified separately on the Bid Form.

Prior to sodding or sprigging, soil shall be properly prepared and fertilized. The top 3± inches of soil shall be pulverized to remove roots, sticks, etc. and smooth the surface. Area shall be fertilized at a minimum rate of 500 pounds per acre. Fertilizer shall be mixed into the top 3 inches of soil by raking, disking, or other acceptable method. Do not overfertilize areas in order to avoid damaging growth. Fertilizer shall be "Vertigreen," "Vigaro," or approved equal. It shall contain not less than 5% nitrogen, 10% phosphorus, and 4% potash. If the area soil requires, by test, adjustment of the pH for proper growth of ground cover, ground limestone shall be applied to bring the pH into the proper range.

Sod shall be at least 8 inches wide and 12 inches long with at least 3 inches of dirt on the roots. It shall be placed on the prepared surfaces with edges in close contact and, as just as is practicable, in a position to break joints. Each section shall be pounded into place with wooden tamps or other approved implements. Sod shall be maintained moist from the time of its removal until reset and shall be reset as soon as practicable after removal. Immediately after placing, it shall be rolled or hand tamped to the satisfaction of the Engineer. On steep slopes, pinning or pegging will be required to hold the sod in place.

Sprigs shall be placed in a random manner at spacing suitable for optimum growth and cover as recommended by the supplier.

Immediately prior to sodding or sprigging, the area shall be sprinkled until saturated to at least a 1-inch depth and kept moist until sodding or sprigging is completed. Sprigs or sod shall be watered as required after setting (normally through a 14-day period). Contractor shall not allow any equipment or material on any planted area and shall erect barricades and guards if necessary to prevent his equipment, labor or the public from traveling on any planted area until satisfactory growth is established.

6. SPECIAL CONSTRUCTION ITEMS

6.1 Roadway Crossings - Roads, streets or highways will be crossed at locations and in the manner as designated by the Drawings. State Highway crossings will be subject to the requirements of the crossing permit obtained from the Kentucky Department of Highways.

When working in or near lines of traffic, the Contractor shall provide warning signals or flagmen as required by the Kentucky Department of Highways.

6.3 Maintaining Traffic while Crossing Streets and Highways - At various locations on this project (in addition to what might be specifically shown on the Contract Drawings) the nature of construction and traffic conditions will require that the Contractor utilize and maintain heavy steel plates to facilitate traffic. These steel plates shall be of sufficient size and thickness to be utilized for varying trenching conditions.

All costs associated with furnishing, placing, maintaining and using these steel plates shall be merged into the Contractor's unit price bid for water mains.

6.4 Water Mains in Bores - All bore crossings underneath railroads or highways shall be performed in accordance with the requirements of the parties or agencies having jurisdiction of these locations. The Contractor shall contact these parties or agencies prior to starting work and shall meet all requirements of these parties or agencies in regard to methods of construction and safety precautions to be taken in performing the bore work. All costs involved in meeting these requirements shall be pain for by the Contractor and no additional compensation will be allowed.

Excavation for all bores on this project shall be unclassified and no distinction made between rock and other materials excavated, with the cost of excavation merged into the unit price per foot of pipe in bore. Refer to casing pipe specifications in Materials.

7. SLOPE PROTECTION AND EROSION CONTROL

This section shall consist of temporary control measures as shown in the Drawings or directed by the Engineer or as required by the Commonwealth of Kentucky Division of Natural Resources during the life of the Contract to control erosion and water pollution through the use of hay bales and other control devices.

The temporary pollution control provisions contained herein shall be coordinated with the permanent erosion control features to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.

a. Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing five (5) cubic feet or more of material.

   Baled hay or straw checks shall be used where the existing ground slopes in ditches or other areas where siltation erosion or water run-off is a problem.

b. Baled hay or straw erosion checks - Hay or straw erosion checks shall be embedded in the ground 4 to 6 inches to prevent water flowing under them. The bales shall also be anchored securely to the ground by wooden stakes driven through the bales into the ground. Bales can remain in place until they rot or can be removed after they have served their purpose, as determined by the Engineer. The Contractor shall keep the checks in good condition by replacing broken or damaged bales immediately after damage occurs. Normal debris clean-out will be considered routine maintenance.

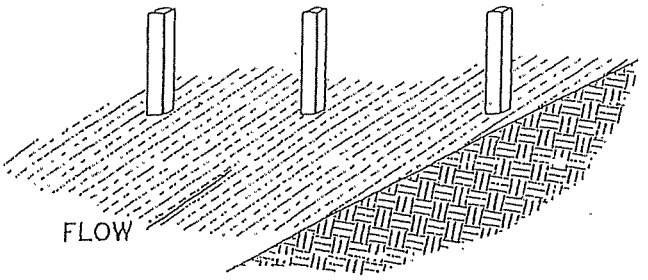
c. Temporary silt fences - Silt fences utilizing posts, filter cloth (burlap or plastic filter fabric, etc.) or other approved materials are temporary measures for erosion control. These fences shall be installed to retain suspended silt particles in the run-off water.

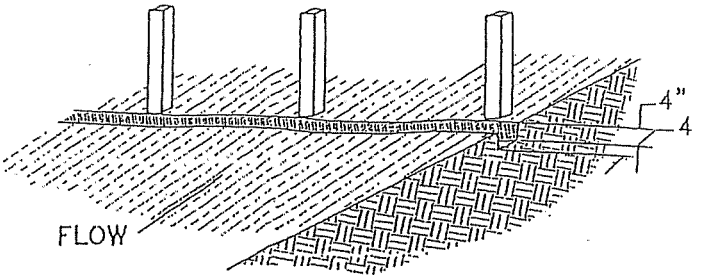
d. The temporary erosion control features installed by the Contractor shall be acceptably maintained by the Contractor until no longer needed or permanent erosion control methods are installed. Any materials removed shall become the property of the Contractor.

   In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of work as scheduled, and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense.

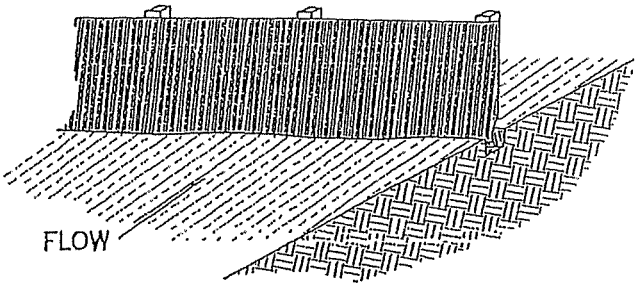
e. Erosion control outside project area - Temporary pollution control shall include construction work outside the project area where such work is necessary as a result of construction such as borrow pit operations, haul roads and equipment storage sites. Bid price in such cases shall include all necessary clearing and grubbing, construction incidentals, maintenance, and site restoration when no longer needed.

f. No separate measurement and payment will be made for this work. It will be considered a subsidiary obligation of the Contractor under other bid items to which it reflects.

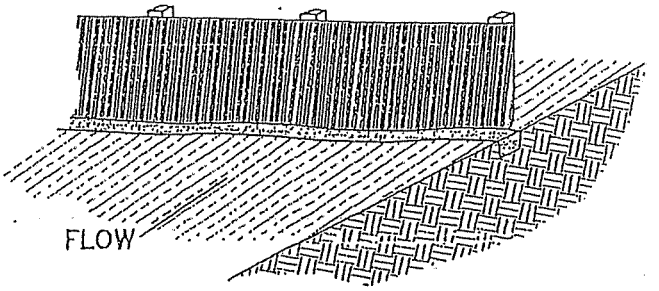




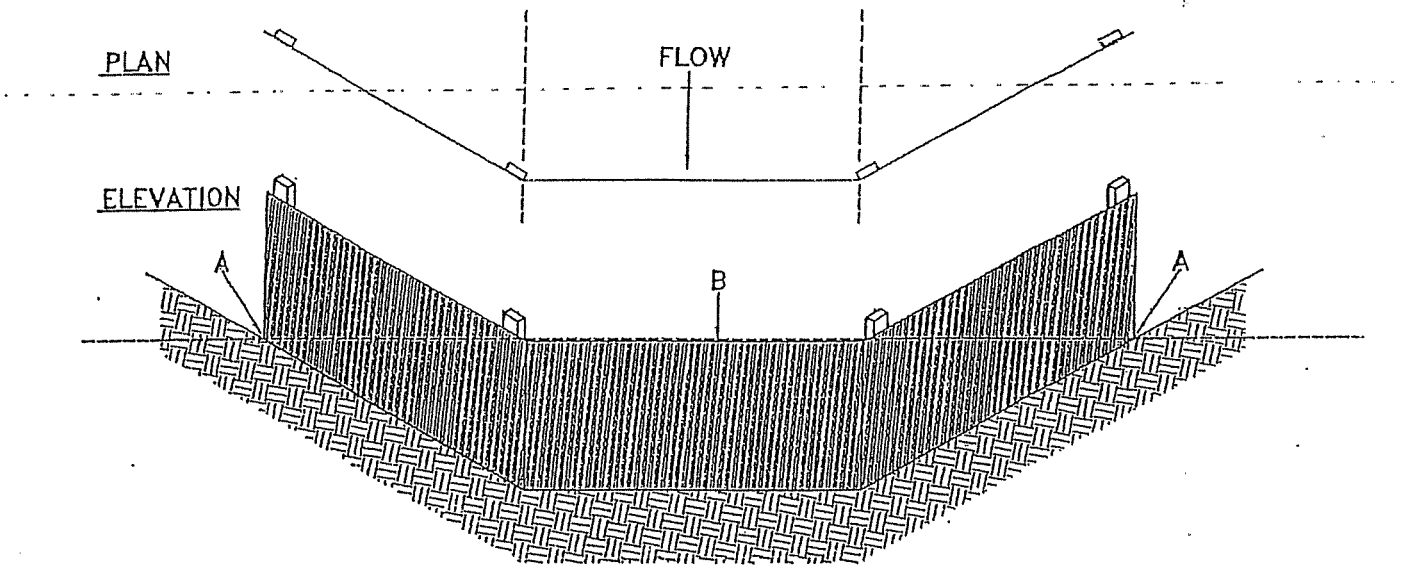
3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



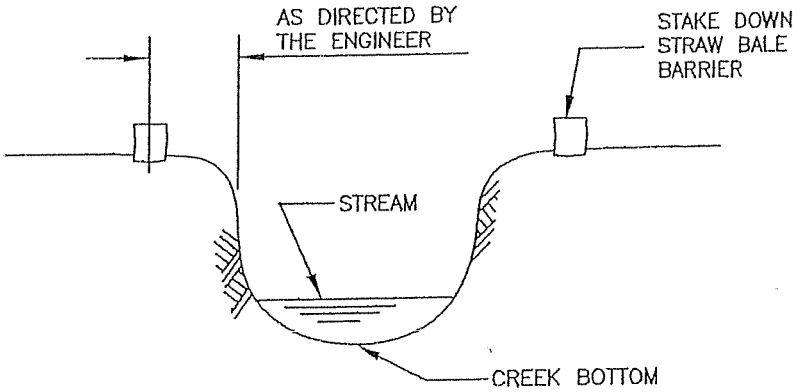
CONSTRUCTION OF A FILTER BARRIER

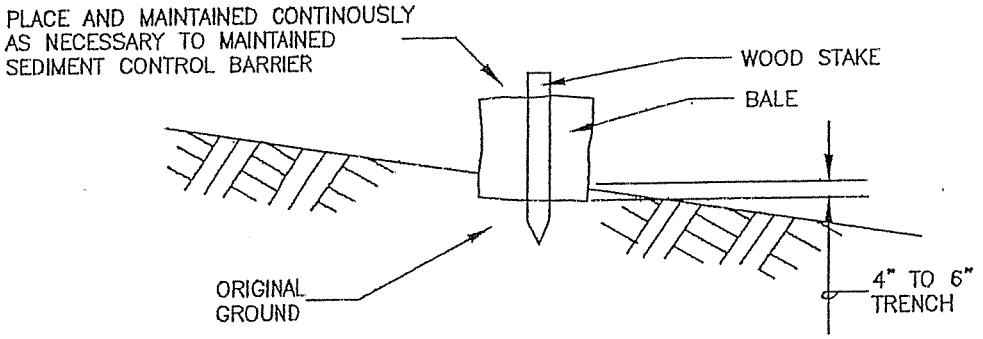


POINTS "A" SHOULD BE HIGHER THAN POINT "B".

PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

SILTATION FENCE





STRAWBALE SEDIMENT CONTROL BARRIER DETAIL

SCALE: NONE

WATER MAINS AND APPURTENANCES

SECTION 4

TESTING AND ACCEPTANCE

1. GENERAL

Upon completion of the construction work the Contractor shall conduct the necessary pressure and leakage tests, and shall disinfect the completed water mains and appurtenances. The Contractor shall furnish all labor, tools, equipment and materials for making the tests. In the event that the pressure or leakage test is unsatisfactory, or bacteriological tests indicate that disinfection is in complete, the Contractor shall take corrective measures and shall repeat the tests until satisfactory results are obtained. Tests shall be made in the presence of an authorized representative of the Engineer.

2. PRESSURE AND LEAKAGE TESTS

Each section of the completed water line shall be subjected to a pressure test. The section to be tested shall be valved off after having been filled with water, and a positive displacement test pump shall be used to pump clean water into the section to build up a test pressure of 200 psi at the point of maximum pressure in the test section. Each valved section of pipe shall be slowly filled with water and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. The system shall be allowed to stabilize at the test pressure before conducting any leakage test. The test pump shall then be valved off from the system and the pressure shall be observed over a period of at least 2 hours.

Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Owner.

Any exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until it is satisfactory to the Owner.

No pipe installation will be accepted if the leakage is greater than that established in AWWA C600. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

A drop in pressure of 5 psi or more during the one hour test shall be taken as an indication of leakage. In the event leaks are found and corrected, the Contractor shall repeat the pressure test using the same procedure described above. Should the Contractor be unable to obtain a satisfactory pressure test over a duration of at least 2 hours, he shall then be required to perform a leakage test using a water tap and standard water meter to measure the leakage in the test section at system pressure over a period of 24 hours. Leakage during the 24-hour period must not exceed the allowable leakage for mechanical or push-on joints as shown in Table 7 of AWWA C600, latest revision, and reproduced on the following page. Should the system fail to pass the leakage test, the Contractor will be required to locate and correct the leaks and to retest the system until satisfactory results can be obtained.

The Contractor shall provide suitable first quality pressure gauges with 5 lb. or smaller graduations and a standard 5/8" x 3/4" water meter in the event the meter is required for the leakage test. Pressure gauges and water meter shall be in good condition and shall be subject to such tests for proof of accuracy as the Engineer may require.

Allowable Leakage per 1,000 feet (305 m) of Pipeline* - gph+

Avg. Test Pressure psi (Bar)	Nominal Pipe Diameter - in.															
	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	54
450 (31)	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78	5.73	6.69	7.64	8.60
400 (28)	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.41	6.31	7.21	8.11
350 (24)	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21	5.06	5.90	6.74	7.58
300 (21)	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90	4.68	5.46	6.24	7.02
275 (19)	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73	4.48	5.23	5.98	6.72
250 (17)	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56	4.27	4.99	5.70	6.41
225 (16)	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38	4.05	4.73	5.41	6.03
200 (14)	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09	5.73
175 (12)	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77	5.36
150 (10)	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41	4.97
125 (9)	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03	4.53
100 (7)	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60	4.05

*** If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.**

+ To obtain leakage in liters/hour, multiply the values in the table by 3.785

Copied from AWWA C600.

3. DISINFECTION

All water line extensions and appurtenances shall be disinfected upon completion. After the lines have been flushed or otherwise suitably cleaned to remove dirt or debris which may have been introduced into the lines during construction, disinfection shall be accomplished in accordance with the provisions of AWWA Standard for Disinfecting Water Mains: AWWA C651, latest revision.

The basic disinfection procedure consists of: (1) Preventing contaminating materials from entering water lines and appurtenances during storage, construction or repair; (2) Removing, by flushing or other means, those materials that may have entered the water lines and appurtenances; (3) Chlorinating any residual contamination that may remain and flushing the chlorinated water from the lines; and (4) Determining the bacteriological quality by laboratory testing after disinfection.

3.1 Preventing Contamination During Construction

Heavy particulate matter and debris generally contain bacteria and can prevent even very high chlorine concentrations from contacting and killing such organisms. It is, therefore, essential that the Contractor utilize procedures to assure that the water lines and appurtenances are thoroughly clean for the final disinfection by chlorination. Toward that end, it is important for the Contractor to prevent contamination of water lines and appurtenances during storage and installation.

All openings in the pipelines shall be closed with watertight plugs when pipe laying is stopped for any reason. Rodent proof plugs may be used when it is determined that watertight plugs are not practicable, where their use could result in pipe flotation if water enters the trench, or where thorough cleaning will be performed by flushing or other means. Workmen need to routinely check the pipeline for contaminating material and keep the pipeline as clean as practicable.

Joints of all pipe in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry enough to prevent trench water from entering the pipeline. All jointing material and lubricates shall be as recommended by the pipe manufacturer and shall be suitable for use in potable water lines. Trench water shall be kept out of the pipelines, if possible, by the use of plugs or other suitable means. Protect the jointing material and lubricates from contamination. Lubricates shall be delivered to the Project site in closed containers and shall be kept clean.

3.2 Flushing or Cleaning by Other Means

If dirt or debris does find its way into the pipeline and it is likely that it will not be removed by flushing, the interior of the pipe shall be cleaned by mechanical means and then shall be swabbed with one (1) percent hypochlorite disinfecting solution. Cleaning with a swab, pig or similar device should be undertaken only when it has been determined that such operation will not force mud or debris into pipe joint spaces where removal is difficult or impossible.

Velocities of about 2.5 feet per second (fps) or higher are generally required to adequately flush a pipeline. The Contractor is cautioned that the flow rate necessary to reach these velocities is not always practical or even possible. Other methods of cleaning must be employed, and it is even more important to take extra precautions to keep the pipeline clean during the pipe laying operation. This is especially true of large diameter pipes. The following tabulation shows the approximate gallons per minute required to reach a velocity of 2.5 fps for various pipe diameters.

Pipe Diameter, Inches	Gallons per Minute Required
4	100
6	200
8	400
10	600
12	900
16	1,600
20	2,500
24	3,500
30	5,500
36	7,900
42	10,800
48	14,100

When flushing is used to clean pipelines, the Contractor must use care and caution concerning the disposal of water flushed from the lines.

3.3 Chlorination for Disinfection

The forms of chlorine that may be used for disinfection are: (1) liquid chlorine; (2) sodium hypochlorite solution; and (3) calcium hypochlorite granules or tablets. Liquid chlorine must meet the requirements of AWWA B301 and sodium and calcium hypochlorites must meet the requirements of AWWA B300.

Three methods are approved for use under the AWWA standard: (1) the tablet method; (2) the continuous feed method; and (3) the slug method. Each has its advantages under certain situations. The method to be used on this project must be approved by the Engineer before implementation by the Contractor. The continuous feed method is suitable for general application. The slug feed method is suitable for use in large diameter lines where the volume of chlorinated water which must be flushed to waste is of concern and where chemical costs are a consideration. The tablet method is generally more suitable for small diameter pipelines; but the line must be kept dry during installation, preliminary flushing for cleaning is not possible, and the chlorine concentration tends to be less uniform.

(a) The Tablet Method - This method consists of placing granules or tablets in the pipeline as it is being installed and filling the pipeline with potable water when the installation is completed. Only use this method if the pipes and appurtenances are kept clean and dry during construction.

Granules - during construction, granules are placed at the upstream end of the first section of pipe, then at the upstream end of each branch pipeline, and along the pipeline at intervals of 500 feet. The quantity shall be as shown in AWWA C651 and as approved by the Engineer. Do not use this method on solvent-weld plastic or on screwed-joint steel pipe because of the danger of fire or explosion from a reaction of the joint compounds with the calcium hypochlorite.

Tablets - During construction, 5 gram calcium hypochlorite tablets shall be placed in each section of pipe and also one such tablet in each fire hydrant, fire hydrant branch and other appurtenances. The number of tablets shall be as required in AWWA C651 and as approved by the Engineer. The tablets shall be attached by an adhesive such as Permatex No. 1, or approved equal. there shall be no

adhesive on the tablet except on the broad side attached to the surface of the pipe. Attach all tablets to the inside of the pipe at the top with approximately an equal number of tablets at each end of a given pipe length. Make sure the tablets end up at the top of the pipe as installed in the trench.

Filling and Contact - when pipe installation is complete, the pipeline shall be filled with potable water at such a rate that the water within the pipeline will flow at a velocity no greater than one foot per second (1 fps). Precautions shall be taken to assure that air pockets are eliminated. This water shall remain in the pipeline for at least 24 hours. If the temperature is less than 41 degrees F (5 degrees C), the water shall remain in the pipeline at least 48 hours. During this period of contact, all valves and hydrants in the treated section shall be operated to ensure disinfection of these appurtenances. Valves shall be positioned so that the strong chlorine solution in the treated pipeline will not flow into pipelines in active service

(b) Continuous Feed Method - This method consists of placing calcium hypochlorite granules in the pipeline during construction (Contractor's option), completely filling the pipeline with potable water in order to remove all air pockets, flushing the completed pipeline if necessary to remove particulates, then filling the pipeline with potable water chlorinated so that after 24 hour holding period in the pipeline there will be free chlorine residual of not less than 10 milligrams per liter (mg/l).

Placing Hypochlorite Granules - This procedure shall be as outlined under "Tablet Method" above and is at the Contractor's option. Its purpose is to provide a strong chlorine concentration in the first flow of flushing water passing through the pipeline.

Preliminary Flushing - Before being chlorinated, the pipeline shall be filled to eliminate air pockets and shall be flushed to remove particulates. The flushing velocity shall not be less than 2.5 fps. Part 3.2 above contains a table showing the rates of flow required to produce this velocity in pipelines of various sizes. Flushing is no substitute for keeping the pipeline clean during construction because some contaminants resist removal by flushing at any feasible velocity. For pipelines of 24-inch diameter and larger, broom sweeping and careful removal of all debris, silt and other contaminants is an acceptable alternative to flushing.

Chlorinating the Pipeline and Appurtenances - Water from existing distribution system or other approved source shall be made to flow at a constant, measures rate of flow into the newly laid pipeline. The regulation of this rate of flow is important and shall be as approved by the Engineer.

At a point not more than 10 feet downstream from the beginning of the new pipeline, water entering this line shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 25 mg/l free chlorine. To assure that this concentration is provided, the concentration shall be measured at regular intervals in accordance with procedures established in AWWA C651.

The devices and methods used to measure rates of flow, apply the chlorine solution and test the concentration shall be as approved by the Engineer and in accordance with AWWA C651.

During the application of chlorine, valves shall be positioned so that the strong chlorine solution in the pipeline being treated will not flow into water lines in active service. Chlorine application shall not cease until the entire pipeline is filled with heavily chlorinated water. The chlorinated water shall be retained in the pipeline for at least 24 hours, during which time all valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances. At the end of this 24-hour period, the treated water in all portions of the pipeline shall have a residual of not less than 10 mg/l free chlorine.

(c) Slug Method - This method differs from the Continuous Feed Method described above in that the disinfection is accomplished by a slug of water containing highly concentrated chlorine (100 mg/l) flowing slowly through the length of the pipeline. The slow flow ensures that all parts of the pipeline and the appurtenances will be exposed to the highly chlorinated water for a period of not less than 3 hours.

For the execution of this method, refer to Part 3.3(b) above for all procedures except as described below.

Chlorinating the Pipeline and Appurtenances - At a point not more than 10 feet downstream from the beginning of the new pipeline, water entering the new pipeline shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 100 mg/l free chlorine. To ensure that this concentration is provided, the chlorine concentration should be measured at various intervals. The chlorine shall be applied continuously and for a sufficient period to develop a solid column, or "slug", of chlorinated water that will, as it moves through the pipeline, expose all surfaces to a concentration of approximately 100 mg/l for at least 3 hours.

The free chlorine residual shall be measured in the slug as it moves through the pipeline. If at any time it drops below 50 mg/l, the flow shall be stopped, chlorination equipment shall be located to the head of the slug; and, as flow is resumed, chlorine shall be applied to restore the free chlorine in the slug to not less than 100 mg/l.

As the chlorinated water flows past fittings and valves, these valves, hydrants and other appurtenances shall be operated so as to disinfect these items.

(d) Final Flushing - After the applicable retention period (contact time), heavily chlorinated water should not remain in prolonged contact with the pipeline or appurtenances. To prevent damage to the pipe lining, the pipe itself or to appurtenances, the heavily chlorinated water shall be flushed from the pipeline until chlorine measurements show that the concentration in the water leaving the pipeline is no higher than that generally prevailing in the water system or is acceptable for domestic water use.

Disposal of Heavily Chlorinated Water - The environment to which the chlorinated water will be discharged shall be inspected. If there is any question that discharge of the water flushed from the pipeline will cause damage to the environment, then a reducing agent shall be applied to the water to be wasted in order to neutralize the chlorine residual remaining in the water. Where necessary, federal, state or local regulatory agencies should be contacted to determine specific provisions for the disposal of heavily chlorinated water. The procedure used for disposal shall be subject to review and approval by the Engineer prior to initiating any disposal.

3.4 Bacteriological Testing

upon completion of the disinfection and flushing procedures, samples of the water from the treated pipeline shall be taken using methods in accordance with AWWA C651 and as approved by the Engineer. Samples shall show the absence of coliform organisms before the testing is considered complete and the new pipeline put in service.

In the event that the samples show the presence of coliform bacteria or an excessive total count, the disinfection procedure shall be repeated by the Contractor until samples of satisfactory bacteriological quality are obtained.

The Contractor shall furnish all equipment, material (except for the sample bottles which will be furnished to the Contractor by the Owner at no cost to the Contractor) and labor necessary for this testing procedure and shall perform the sampling. The samples shall be turned over to the Owner for testing at a laboratory designated by the Owner.

(a) Procedures - All sampling and testing shall be done in accordance with AWWA C651 and Standard Methods for the Examination of Water and Wastewater.

At least one sample shall be collected from the new pipeline and one from the branch. In the case of long pipelines, samples shall be taken along its length as well as at its end. Sample spacing shall generally not exceed 2,500 feet.

If, during construction, trench water has entered the pipeline or excessive quantities of dirt or debris have entered the pipeline, bacteriological samples shall be taken at intervals of approximately 200 feet and shall be identified by location. In these cases, samples shall not be taken until water has stood in the pipeline for at least 16 hours after completion of the flushing.

Samples shall be collected in sterile bottles furnished by the Owner for the purpose of bacteriological sampling (treated with sodium thiosulfate).

No hose or fire hydrant shall be used in the collection of the samples. A corporation cock installed in the pipeline with a copper tube gooseneck assemble, or other arrangement as approved by the Engineer, may be used.

(b) Redisinfection - If the initial disinfection fails to produce satisfactory bacteriological samples, the pipeline may be reflushed and shall be resampled. If check samples show the presence of coliform organisms, the pipeline shall be rechlorinated by the continuous feed method or by the slug feed method until satisfactory results are obtained.

3.5 Acceptance

When testing of the samples shows that there is no presence of coliform organisms or, in the case of the standard plate count, there is not an excessive total count, the disinfection procedure is considered successful and the pipeline and appurtenances may be put in service provided all other Contract provisions, necessary or required for putting the pipeline in service, have been met.

4. TESTING OF VALVES and OTHER APPURTENANCES

Upon completion of installation, all valves, fire hydrants, service connections, meters, and other appurtenances shall be operated in the presence of the Engineer to verify proper operation.

5. TESTING OF WATER SERVICES

The Contractor shall test all new water services at the same time that the water main is tested or the Contractor shall expose all connections, taps, curb cocks, unions, and any other fittings when the system water pressure is restored to the meter. These fittings shall be inspected by the Contractor in the presence of the Engineer. If any leaks are found, these leaks shall be repaired in a manner approved by the Engineer.

WATER MAINS AND APPURTENANCES

SECTION 5

MEASUREMENT AND PAYMENT

1. GENERAL

The Contractor shall furnish all labor, tools, equipment and materials to construct the proposed improvements complete as shown on the Drawings and described in these Specifications. The work shall be measured for payment in accordance with applicable provisions of these Specifications and payment shall be made on the basis of the unit prices or lump sum prices bid. The sum of the payments for eligible pay items contained in the Proposal Form shall be the compensation to be paid for the completed project; provided however, that changes in the work covered by written change orders, properly executed, may result in additions or deductions from the Contract price.

The Contractor's attention is called to the fact that although the pay items shown shall be the basis for establishing the Contract price, the description of the pay items do not necessarily reflect the extent of work to be performed. The cost of the incidental work such as clearing and grubbing, trenching, backfilling, testing, curbs, curb and gutters, sidewalks, etc. which is necessary but which is not specifically listed as one of the pay items, shall be included in the prices bid for the pay items to which the incidental work is most closely related.

2. WATER MAINS

A. Measurement - Water mains shall be measured for payment the centerline of the pipe to the nearest 0.1 foot as shown on the Drawings.

B. Payment - Water mains shall be paid for on the basis of the respective unit prices bid per linear foot for pipe of the various sizes.

Payment for furnishing and installing the water mains shall constitute compensation in full for furnishing all labor, tools, equipment and materials and installing the water mains complete, including incidental work such as location and protection of existing utilities, clearing, excavation (including rock), dewatering trenches, bedding with crushed stone or approved "Select Excavated Material" in accordance with Contract Drawings and Project Specifications, 3-inch detection tape and trace wire, backfilling, testing, disposal of surplus excavated material, the removal of existing pavements, curb and gutter, sidewalks, driveways, brush and timber, structures and piping to be relocated or abandoned; also sheeting, diking, well pointing, bailing, dewatering; the furnishing and placing of bulkheads, the restoration of any utilities, parkways, trees, shrubbery, culverts, fences, and other items not covered under subsequent items and testing.

Backfill shall be in accordance with Section 3 (Construction), Paragraph 4. Water main pipe shall be classified as under roadway if the waterline is under or within three feet of the edge of the pavement. Any water line located more than three feet from the edge of the pavement shall be classified as outside roadway.

Pavement for water lines under roadway shall include backfill with crushed stone (No. 57) as per specifications.

Payment for water mains in bore shall be on the basis of linear foot measured from face of bore to face of bore. No payment for additional footage over the established quantity shall be made without prior approval of the Engineer.

3. FITTINGS

A. Measurement - Pipe fittings for water mains shall be compact ductile iron pipe fittings and will be measured for payment by multiplying the number of fittings in each classification by the standard weight of the fitting as shown in appropriate tables of ANSI/AWWA CI 53/A21.53-84 "Ductile Iron Compact Fittings 3" Through 12" for Water and Other Liquids." Pipe fittings for larger sizes may be Cast Iron or Ductile Iron and will be measured for payment based on appropriate weight tables of USA Specification A21.53-84, "American Standard for Cast Iron Fittings 3" through 48" for Water and Other Liquids". Weights of fittings shall be inclusive of bolts, gaskets, or other appurtenances and shall be as shown in the above specification rather than actual invoice weights.

B. Payment - Payment for furnishing and installing compact ductile iron pipe fittings complete in accordance with these Specifications will be made on the basis of contract unit price bid per pound for pipe fittings and shall constitute compensation in full for furnishing and installing the fittings together with all incidental and related work except as specifically covered by other pay items. **Note: The Contractor shall include the cost difference between conventional MJ glands and the restrained glands (where indicated on the Contract Drawings and required) in the unit price established for restrained piping systems.**

4. VALVE AND BOX (Gate Valves)

A. Measurement - Valves and boxes will be measured by actual count on each size and type of valve installed in the completed system.

B. Payment - Payment for furnishing and installing valves and boxes of the various sizes and classifications, together with any necessary joint accessories, retainer glands, adapters, extension stems (when required) and concrete support pad shall be made on the basis of the Contract unit price bid. Such payment shall constitute full compensation for furnishing and installing the valves and boxes complete in full in accordance with the Drawings and Specifications.

5. CONNECTIONS AND/OR TAPPING SLEEVE AND VALVE CONNECTIONS

A. Measurement - The tapping sleeve and valve connections will be measured by actual count each for each size and type installed and connected for a completed system.

B. Payment - Payment for furnishing, installing, connections, and/or connecting tapping sleeve and valves together with any necessary joint accessories, tapping machine, tapping, adapters, retainer glands, valve boxes, extension stems, and all other labor, materials, and work to complete the connection with the existing water main. Such payment shall constitute full compensation for furnishing and installing the tapping sleeve and valve connections and tie-ins in full compliance with the Drawings and Specifications.

6. SERVICE LINE AND/OR RECONNECTION ITEMS, IF APPLICABLE

A. Measurement - Service line taps on the water mains will be measured by the actual count of each size tap installed. Service lines shall be measured by the linear foot from the center of the water main along a line perpendicular to the water main to the inside edge of the meter box, or to a point as designated by the Engineer.

B. Payment - Payment for taps shall be made at the unit price bid and shall be full compensation for all labor and materials required to complete the installation. No separate payment shall be made for curb stops or meter boxes on this project.

7. FIRE HYDRANT ASSEMBLY INSTALLATION

A. Measurement - The fire hydrant assembly installation shall be measured by actual count of each installed in the completed system. The 6-inch gate valve shown in the standard detail will be measured and paid under a separate item in this Contract.

B. Payment - Payment for furnishing and installing the fire hydrant assembly shall be based on the Contract unit price bid for each installation. The unit price bid shall include all labor, materials, including extensions and rodding or retainer glands as required, equipment necessary to complete the fire hydrant installation as shown on the Drawings (including the hydrant, increased bury depths exceeding 42 inches when required, excavation, stone, concrete backfill and other necessary work incidental for a complete installation).

8. ROADWAY MAINTENANCE, DRIVEWAY AND ROADWAY REPLACEMENT

1. DRIVEWAY REPLACEMENT

A. Measurement - Measurement for asphalt driveway or parking lot patch replacement, gravel driveway or concrete driveway or concrete ramp replacement shall be made by the linear foot along the centerline of the water main for the actual quantity placed.

B. Payment - Payment for these items shall be made at the unit prices bid per linear foot and shall include the cost of all labor and materials necessary to construct these items at the locations and to the details shown on the Contract Drawings.

2. ROADWAY REPLACEMENT

A. Measurement - Measurement for Type "A" asphalt pavement replacement shall be made by the linear foot along the centerline of the water main for the actual quantity placed.

B. Payment - Payment for roadway replacement items shall be made at the unit prices bid and shall include the cost of all labor and materials necessary to construct these items at the locations and to the details shown on the Contract Drawings.

NOTE: Payment for pavement replacement shall be made on the basis of the unit prices bid for various classifications of pavement as indicated in the Proposal Form. Such payment shall constitute the furnishing of all labor, materials, and equipment and replacing the damaged pavement, including the crushed stone base as required. The

Contractor is advised that, although the limits of payment shall be as described under paragraph A. above, he shall be responsible for replacing all pavement damaged during construction, so that the paved area is left in a condition as good as or better than before the start of the construction.

All new and existing gas valves, water valves, and manholes will be adjusted to the final surface elevations by the Contractor. Cost for this work is to be merged into unit price construction items for pavement replacement.

9. TOPSOIL AND SEEDING OF TRENCHES

A. Measurement - Measurement for topsoil and seeding of trenches will be made by the linear foot of trench along the centerline of the water main.

B. Payment - Payment shall be made at the unit price bid and shall include all costs of labor and materials (including fine grading, mulching) for the completion of this item.

10. CLASS C CONCRETE THRUST BLOCKS AND/OR ENCASEMENT

A. Measurement - Class C concrete used in thrust blocks, encasement, or caps will be measured by computing the theoretical volume of concrete required to construct the item in accordance with Standard Detail Drawings shown on the Construction Drawings. The length shall be the actual length of such concrete as installed at the Engineer's direction. Measurement for Class C concrete used in pads, low piers, or blocks shall be placed on the theoretical volume required for the dimensions of the structure as shown on the Drawings or as directed by the Engineer.

B. Payment - Payment for Class C concrete shall be made on the basis of the unit price bid per cubic yard, and shall constitute full compensation for excavation, forming, furnishing and placing the concrete and other incidental work required to complete the project.

11. AIR RELEASE VALVE AND MANHOLE

A. Measurement - The air release manhole installation will be measured by actual count of each size and type valve installation installed in the completed system.

B. Payment - Payment for furnishing and installing the Air Release Manhole shall be based on the contract unit price bid for each type installation. The unit price bid shall include all labor, materials and equipment necessary to complete the valve installation as shown on the Drawings (including the valve(s) and connecting piping, 1-inch test valve, manhole with flat top, cover, crushed stone, excavation, backfill, and incidental work necessary for a complete installation).

12. WATER VALVE / WATER LINE MARKERS

A. Measurement - Measurement shall be by actual count of water valve / water line markers installed.

B. Payment - Payment for water valve / water line markers shall be on the basis of the unit price bid per each (EA) water valve / water line marker and shall constitute payment in full for furnishing and installing the water valve / water line marker(s) as described in the Specifications and Contract Drawings.

13. UNCLASSIFIED EXCAVATION FOR UNDERCUTS

A. Measurement - In areas where directed by the Engineer to remove unsuitable material below grade this item shall be measured by the formula (4/3 pipe O.D. + 24)/12 x length x depth divided by 27 for sewer mains and outside diameter plus 36 inches x depth divided by 27 for manholes.

B. Payment - Payment shall be made at the unit price bid and no distinction shall be made between rock and earth excavation as far as payment is concerned.

14. CRUSHED STONE REFILL FOR UNDERCUTS

A. Measurement - In areas (other than areas specifically designated by these Specifications) where directed by the Engineer to refill with crushed stone an undercut where the Engineer has directed that unsuitable material be removed, this item shall be measured for payment by the formula (4/3 O.D. + 24/12) (length (ft)) (depth (ft)) divided by 27.

B. Payment - Payment for crushed stone refill shall be at the unit price bid per cubic yard and such payment shall constitute complete compensation for all extra labor, materials, and equipment necessary to furnish, haul, place and compact the crushed stone backfill.

Note: This payment is only for refill. All bedding and backfill required is to be merged into the unit price bid for water main and/or water main under roadway.

15. PLAIN STONE RIP-RAP

A. Measurement - Measurement for plain stone rip-rap shall be made by the square yard as measured in place.

B. Payment - Payment shall be made at the unit price bid and shall include the cost of labor and materials necessary to construct the item at the locations on the Contract Drawings or as directed by the Engineer.

16. LUMP SUM BID ITEMS

Lump Sum Construction Items shall be paid under established items and shall include all related work as set forth in the Proposal Section and as indicated on the Contract Drawings.

DIVISION S

WATER STORAGE RESERVOIR AND APPURTENANCES

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FOR

DIVISION S

WATER STORAGE RESERVOIR AND APPURTENANCES

WATER STORAGE RESERVOIR AND APPURTENANCES

SECTION 1

GENERAL REQUIREMENTS

1. GENERAL

1.1 The Contractor shall be responsible for all labor, materials and equipment necessary for the design, fabrication, construction, painting, disinfection and testing of a prestressed composite concrete ground supported water storage tank. Design and construction of the ground supported water storage tank shall conform to all requirements of AWWA D110 Standard for Wire- and Strand-Wound, Circular, Prestressed Concrete Water Tanks except as modified by the requirements of these contract documents.

1.2 The design and construction of the water storage tank shall only be undertaken by a Contractor with a minimum of five years experience with water tank construction. The Contractor must be able to demonstrate experience through the design and construction of at least five ground supported water storage reservoirs. The Contractor shall not subcontract either the design or erection of the steel tank and support structure. The work shall be measured for payment in accordance with applicable provisions of the Specifications. Payment shall be made on the basis of lump sum price.

1.3 The Contractor's attention is directed to the provision that all work including site work, water main, roadway, reservoir, excavation, backfill, valves, valve pits and all other work necessary for a complete and operating installation shall be included in the lump sum item. All work shall be constructed in accordance with the Contract Documents including the Contract Specifications and Contract Drawings.

1.4 The Contractor's attention is directed to the requirements of Divisions A and H. These Divisions are applicable to the work under this Section.

1.5 Site work and reservoir foundations set forth the requirements for excavation backfill and foundations. In the event unsuitable foundation material and/or foundation conditions are encountered at the grades shown on the Drawings, unit price items are established as set forth in the Proposal and as listed herein for test drilling, excavation as classified, stone refill or Class C concrete refill. Measurement and payment for these unit price items are as follows:

Measurement for payment and compensation for unit price items will be as follows:

1.5.1 Test Drilling

Compensation for test drilling will be based upon the Contract Unit Price multiplied by the actual linear feet drilled. Compensation shall include payment for all costs including, but not limited to, labor, materials, equipment and other considerations necessary to set up and drill test holes.

1.5.2 Supplemental Rock Excavation

Compensation for supplemental rock excavation ordered removed will be based upon the Contract Unit Price multiplied by the measured cubic yards, or fraction thereof, removed. For payment, the limit of rock excavation shall be a line 3 feet outside the wall or 12 inches outside the footing, whichever is greater. The depth of rock excavation under this item shall be to the depth directed by the Engineer. Rock shall include any material which, in the opinion of the Engineer, must be removed by blasting or be percussion drilled.

Compensation shall include payment for all costs including, but not limited to, removing and disposing of the excavated material, wet or dry, and all other costs related to the excavation including any required dewatering.

1.5.3 Supplemental Dirt Excavation

Compensation for supplemental dirt excavation ordered removed will be based on the Contract Unit Price multiplied by the measured cubic yards, or fraction thereof, removed. For payment, the limit of dirt excavation shall be a line 3 feet outside the wall or 12 inches outside the footing, whichever is greater. The depth of the dirt excavation under this item shall be to the depth directed by the Engineer.

Compensation shall include payment for all costs including, but not limited to, removing and disposing of the excavated material, wet or dry, and all other costs related to the excavation including any required dewatering.

1.5.4 Granular Refill

Compensation for granular refill ordered placed will be based upon the Contract Unit Price multiplied by the measured cubic yards placed. For payment, the limit of granular refill shall be a line 3 feet outside the wall or 12 inches outside the footing, whichever is greater, and up to the bottom elevation of the structure or to the bottom of the gravel layer if such is indicated on the Contract Drawings. Such gravel layers, if indicated on the Contract Drawings, shall be included under the appropriate lump sum item. Compensation shall include payment for all costs including, but not limited to, placing, compacting and grading of the granular refill material.

1.5.5 Class C Concrete

Compensation for Class C Concrete refill ordered placed will be based upon the Contract Unit Price multiplied by the measured cubic yards placed.

Compensation shall include payment for all costs including, but not limited to, placing and grading of the Class C concrete refill.

1.6 Submittals

The bidder shall submit with his proposal:

1. A list of five wire- and/or strand-wound prestressed concrete composite water storage tanks constructed within the last five years including the Owner, tank capacity and the Engineer.

1.7 Standard Specifications

All work on the water storage tank shall fully conform to the requirements of the latest published editions of the following Standard Specifications:

1. AWWA (American Water Works Association) D110 Standard for Wire- and Strand-wound Circular Prestressed Concrete Water Tanks.
2. AWWA C652 - Standard for Disinfection of Water Storage Facilities.
3. NSF (National Sanitation Foundation) 61 - Materials in contact with Potable Water.
4. ACI 318 - Building Code Requirements for Reinforced Concrete
5. ACI 301 - Standard Specification for Structural Concrete

1.8 Tank Details

The ground-supported reservoir shall be a wire-wound circular prestressed composite concrete water tank of the most economical design. All parts of the tank shall be designed to safely withstand the maximum stresses to which they may be subjected during erection and operation.

1. The minimum operating capacity of the storage tank will be 1,000,000 US gallons.
2. The height of the tank, top of foundation to High Water Level, shall be 40 feet.
3. Top of foundation elevation shall be 802.00.
4. The existing ground elevation is 805.00 ±.
5. The finished ground elevation shall be 801.50 ±.

WATER STORAGE RESERVOIR AND APPURTENANCES

SECTION 2

SITE WORK AND RESERVOIR FOUNDATIONS

1 GENERAL

1.1 The reservoir site with existing and finished ground contours, reservoir location, piping and valve location, access road, site drainage, and other site-related information is as shown on the Drawings.

1.2 The Contractor shall perform site clearing, excavation, grading, drainage, seeding and paving as required in order to complete the project in accordance with the Drawings and Specifications.

1.3 The Engineer will locate reference points on the building line and bench mark, and the Contractor will establish elevations and locations of all structures with the approval of the Engineer. The Contractor is to protect all reference points from dislocation or damage. All structures are to be located prior to beginning any excavation.

1.4 Contractor shall be required to stay within the property and easement limits as shown on the Drawings unless arrangements which are satisfactory to the Owner are made with adjacent property owners.

2. SITE GRADING AND EARTHWORK

2.1 The Contractor shall remove and stockpile the topsoil from the construction area for use in finished grading. After the topsoil has been removed, the area shall be graded to the approximate levels indicated on the Drawings. Excavated material which is suitable for use as backfill shall be stored at the site and used as required for final grade. Surplus material and material unsuitable for use shall be removed from the site and disposed of at the Contractor's expense.

Trees, stumps, brush, and used construction materials must be removed from the job site and disposed of in accordance with local laws.

NOTE: The Contractor shall abide by OSHA regulations and all other applicable safety rules and regulations. The Contractor will be held responsible for any damages incidental to this work.

2.1.1 Excavation for Structures

The Contractor shall excavate to the lines and grades as required for the various structures. Whenever possible, the entire foundation for any structure shall rest on undisturbed soil. No foundation shall rest partly on rock and partly on soil. In the event excavation is inadvertently carried below the bottom of footings, the overdepth excavation shall be filled in with Class C concrete or other approved material at the Contractor's expense.

The Contractor shall be responsible for dewatering and for diversion of surface water run-off around excavated areas. Sheeting, shoring and/or underpinning shall

be provided as necessary to protect personnel or adjacent structures from possible damage.

Where the Drawings or Specifications call for crushed stone subgrade under concrete slabs, the excavation shall be carried to the required additional depth, and the area shall be filled in with crushed stone meeting the Kentucky Transportation Cabinet Department of Highways, Standard Size No. 57, thoroughly compacted by tamping or vibrating in layers not exceeding 6 inches in thickness.

In the event the subgrade under footings does not appear to have the required supporting strength, either because of wet conditions or the nature of the subgrade material, such condition shall be called to the Engineer's attention. The Engineer will then take such steps as may be indicated in order to reduce the bearing pressure or increase the supporting strength of the subgrade. If, in the Engineer's opinion, the unstable subgrade is the result of carelessness or negligence in handling ground water or surface water run-off, the corrective measures shall be at the Contractor's expense.

In excavating trenches for structural footings, step trenches in increments of 8 inches vertically and 24 inches horizontally unless indicated otherwise on the Drawings. Where the building footing rests partly on earth and partly on rock, excavate to a point 6 inches below the bottom of the footing and use No. 57 crushed stone to bring the excavation back to grade. If earth undercutting is inadvertently made, footing will be poured thicker as directed by the Engineer at no additional cost.

2.2.2 Excavation for Pipelines

Trenches shall be neatly excavated to the alignment and depth required for the proper installation of pipe, bedding material and appurtenances. Trench width shall be held to a minimum consistent with proper working space for assembly of pipe. In general, trench width up to a point one foot above top of pipe shall be limited to the nominal pipe diameter plus 16 inches.

Boulders, large stones, shale and rock shall be removed to provide a clearance of 6 inches below and on each side of the pipe.

Trenches shall be dug neatly to line and grade with only a minimum of abrupt changes in line and grade consistent with good construction practices. Trenches dug for gravity flow sewer lines carrying sewer or storm water will be laid to the exact line and grade as shown on the Drawings with such alignment and grade being acceptable to the Engineer.

2.2.3 Classification of Excavation

Where rock excavation is shown as a pay item in the proposal form or a rock allowance is shown for lump sum bids, excavation shall be classified as earth excavation and solid rock excavation. Solid rock excavation shall consist of the removal of all rock larger than 9 cubic feet in volume which cannot be removed by normal trenching or excavating equipment. Material that can be loosened or separated with a pick or that can be excavated with a trencher or backhoe will not be classified as solid rock excavation. In the event rock excavation is not shown as a pay item or adjustment item in the Proposal Form, all excavation will be

unclassified and rock excavation shall be included without any added compensation.

2.2.4 Rock Excavation

Rock excavation shall consist of loosening, removing, and disposing of all rock larger than 9 cubic feet in volume which, in the opinion of the Engineer, can only be removed by blasting or other equivalent methods. Such materials to be classified as solid rock shall include boulders, bed rock, or solid concrete but shall not include pavement or shaley materials that can be loosened by other methods.

Where rock excavation is encountered in trenches, the excavation shall be carried to a depth of 6 inches below the bottom of the pipe. The rock shall also be removed to a width of at least 6 inches beyond the outside of the pipe on each side so that no rock is left within 6 inches of the outside wall of the pipe. Where rock is excavated in the bottom of the trench, the trench shall be brought back to grade by the use of crushed stone which shall be compacted to form a stable base for the pipe laying operation.

No structure shall be constructed partly on rock and partly on earth. Where such a condition is encountered, the rock shall be excavated to a point 6 inches below the bottom of the structure, and No. 67 crushed stone shall be used to bring the excavation back to grade.

The Contractor shall exercise all necessary precautions in blasting operations. Suitable blasting mats shall be provided and utilized as required. Blasting shall be done only by experienced men. Careless shooting, resulting in the ejection of stones or other debris during blasting shall be corrected immediately by the Contractor's representative.

No blasting shall be done unless the Contractor shall have taken out the necessary insurance to fully protect the Owner from all possible damages resulting from the blasting operations. The blasting shall be done in accordance with all recognized safety precautions and in accordance with regulations of authorities having jurisdiction. In addition the Contractor shall exercise the necessary care to safeguard the storage of blasting materials on the property.

Where rock is encountered in the immediate vicinity of gas mains, telephone cables, building footings, gasoline tanks or other hazardous areas, the Contractor shall remove the rock by means other than blasting. Care shall be taken in blasting operations to see that pipe or other structures previously installed are not damaged by blasting. In general, blasting shall not be done within 25 feet of the completed pipe line or structure.

2.2.5 Backfilling

The backfilling to be placed under any portion of a structure shall consist of No. 67 crushed stone, carefully placed and compacted.

Backfill around the outside of structures may consist of excavated material except for rock larger than 1 cubic foot in volume and provided that no rock may be placed within 6 inches of any pipe or within 6 inches of the finished structure or grade. Sufficient earth must be used to fill in any voids in rock or stones used in the

backfill, and the backfill must be compacted in 6-inch layers by hand or mechanical tamping.

No rock larger than 6 inches in any dimension may be used in trench backfill or as backfill in areas where pipes or conduits are to be installed. Trenches or pipes under structures shall be backfilled with No. 67 crushed stone.

2.2.6 Finish Grading

Upon the completion of backfilling, the construction area shall be brought to the desired grade by the use of not less than 6 inches of stockpiled topsoil. It is anticipated that any surplus excavated material except for large stones and boulders may be used to expand the fill area or fill in low areas at the site, but such additional fill must be placed as directed by the Engineer to conform to the desired drainage and landscaping patterns, and such fill must be covered by not less than 6 inches of top soil.

Fill material is to be placed in even layers. Obtain proper moisture content before rolling to obtain specified compaction. Roll and compact yard areas to approximately 90% of optimum moisture density relationship (ASTM D-698A). Place fill on roads and driveways and compact to approximately 95% of optimum moisture density relationship (ASTM D-698A).

Finished grading is to be done in a manner which will result in rounded surface at the top and bottom of abrupt changes in plane, and a uniformly sloping topsoil with no local depressions to form water pockets, and a finished surface which can be easily cared for by hand mowing.

Where rip-rap is called for on the Drawings, coarse rock from excavations may be conserved and used. Rip-rap shall be constructed within reasonable close conformity to the lines and cross sections as indicated on the Drawings and shall generally be hand placed. At least 90% of the stone shall not be less than 8 inches wide by 12 inches long and 12 inches deep and shall be approximately rectangular in shape.

2.2.7 Seeding, Sprigging and Sodding

After finished grading has been completed, all areas disturbed during construction shall be prepared for seeding, sprigging or sodding by pulverizing the top 3 inches and raking to remove roots, sticks, etc. and level the surface. The area shall then be fertilized by a suitable application of high grade commercial fertilizer at a minimum rate of 500 pounds per acre. The fertilizer shall be incorporated into the soil to a depth of 3 inches by raking, discing or other acceptable methods. Care will be exercised to avoid over-fertilizing an area to the extent of damaging growth. The fertilizer used shall be of an approved manufacturer and shall be "Vertigreen," "Vigaro," or equal. It shall contain not less than 5% nitrogen, 10% phosphorous and 4% potash. All fertilizers shall comply with all laws governing sale and manufacturer of fertilizer. Standard ground limestone shall also be applied to the area to be seeded at a rate of about 3,000 lbs. per acre.

The area to be seeded shall be sown with a lawn grass mixture as approved by the Engineer and containing at least 50% Kentucky Blue Grass. Seeding shall be accomplished with a drill or mechanical distributor or other approved sowing

method. Unless otherwise permitted in writing by the Engineer, the seeding operations shall be limited to the following periods: March 1 to June 1 in the Spring; August 1 to November 1 in the Fall. The seeded areas shall be covered with clean straw uniformly distributed or otherwise mulched as approved by the Engineer, and the area shall be kept wet for a period of 14 days to secure an acceptable growth of grass on all areas designated to be seeded. Locations where acceptable growth is not obtained on the first planting shall be re-seeded until such growth is secured. If the Engineer so directs, the ground shall be re-worked and re-fertilized before re-seeding.

This practice shall be avoided unless the previous planting was less than 50% successful. The Contractor shall maintain the area until an acceptable growth is established; and, if any erosion occurs during the construction period, he shall be required to restore the area at no extra cost to the Owner. No mowing or other maintenance of the grass will be required.

In areas of steep slopes and embankments where erosion may occur, sodding or sprigging may be used by the Contractor in order to expedite the development of grass cover. In cases where sprigging of sodding has been specifically called for on the Drawings, it shall be used at no extra cost to the Owner. Fertilization of the soil prior to sprigging or sodding shall be done in accordance with provisions previously stated. Sod for area sodding shall be at least 8 inches wide and 12 inches long and shall have at least 3-inch thickness of dirt on its roots. Sod shall be placed on the prepared surfaces with the edges in close contact, and, so far as possible, in a position to break joints. Each section of sod laid shall be fitted in the space and shall be pounded into place with wooden tamps or other approved implements. The sod shall be maintained moist from the time of removal until reset but shall be placed as soon as practicable after removal from the place where it was growing. Immediately after placing, it shall be rolled or hand tamped to the satisfaction of the Engineer. On steep slopes, or where necessary, pinning or pegging will be required to hold the sod in place. Immediately prior to sprigging or sodding, the area shall be sprinkled until saturated to at least 1 inch in depth and kept moist until the sprigging or sodding is completed. The sprigs or sods shall be watered for a period of 14 days after setting.

The Contractor shall not allow any equipment or material on any planted area and shall erect barricades and guards if necessary to prevent his equipment, labor or the public from traveling on or over any planted area.

2.3 ACCESS ROAD, PARKING AREAS, DRIVEWAYS AND WALKWAYS

The Contractor shall provide drives and walks as shown on the Drawings and described herein. The subgrade on which walks and drives are to be constructed shall be thoroughly compacted during placement and by use under traffic until the material is stabilized or removed and replaced with suitable material which can be compacted. Fine graded shot rock is preferred for the driveway and road subgrades. Just prior to pavement application the surface shall be carefully graded to the desired elevations and slopes.

The grade line will be as designated by the Engineer or as shown on the Drawings. All stumps, brush and other vegetation shall be removed from the area to be excavated or filled. This area shall be stripped of topsoil to a depth not exceeding 12 inches and said topsoil shall be stockpiled outside the construction area. After excavations and

embankments are completed, the stripped material shall be placed on slopes and surfaces of the embankments.

All suitable material removed from excavation shall be used as far as practicable in the formation of embankment, subgrade, shoulders, and slopes. No separate payment shall be made for backfilling over and above the Contract price for excavating the material used for that purpose.

Specification terminology, numbers, sizes, and grade of materials specified are referenced to and taken from the Kentucky Transportation Cabinet Department of Highways "Standard Specifications for Road and Bridge Construction," latest edition.

2.3.1 Embankment

Embankment construction shall conform to the requirements of Section 207, Kentucky Transportation Cabinet Department of Highways Standard Specifications and shall be so constructed to provide adequate drainage at all times.

Embankment materials consisting predominantly of soil shall be placed in layers not exceeding 10 inches in depth before compaction. Each layer shall be compacted to a density not less than 95% of maximum density. Embankment materials consisting predominantly of rock fragments of such size that the material cannot be placed in layers of the normal 10-inch thickness may be placed in layers not exceeding 3 feet in depth. All rock to be placed in the embankment shall be broken into sizes not exceeding 2 feet (maximum dimension). Each layer shall be leveled and smoothed with suitable leveling equipment and by distribution of spalls, finer gradements of rock, or other satisfactory material.

Contractor shall be responsible for stability of all embankments and cut slopes until final acceptance and shall replace or repair at his own expense any portions of the work which becomes displaced or damaged before acceptance. If the work has been properly constructed and protected and damage to embankments or cut slopes occurs due to unusual natural causes during the guarantee period, the Contractor will be paid for the materials used in making the necessary repairs. Damage due to poor workmanship during the guarantee period shall be repaired by the Contractor at no cost to the Owner.

2.3.2 Pavement

Pavement for this project shall consist of crushed stone and/or asphalt as noted on the Drawings. Crushed stone shall conform to Section 303, Tennessee Department of Transportation Specifications, Class "A" Aggregate, D grading (1½-inch size) unless otherwise directed by Engineer. Construction methods shall conform to good practice. Material may be placed in one lift with suitable equipment and shall have proper moisture content for adequate compaction. Compaction shall generally proceed from the edge of spread material to the center, parallel with the centerline of the road. The surface of each layer placed shall be so constructed that the aggregates become firmly keyed and a uniform texture is produced. Any irregularities that develop shall be corrected by loosening the material at those places and adding or removing material as required. Softening of the underlying subgrade resulting from the use of excess water is to be avoided.

Final wearing surface shall not be applied until the project is nearing completion in order to avoid damage by heavy construction equipment and to minimize surface replacement made necessary by the Contractor's operations. Any such damage shall be repaired by the Contractor at no extra cost to the Owner.

2.3.3 Drainage Pipes

Where indicated on the Drawings, Contractor shall furnish and install corrugated metal pipe culvert (CMP) of the sizes indicated. Headwalls, if required, shall be built in accordance with details on the Drawings. CMP shall conform to AASHTO M-190. In rock, pipe shall be bedded on 6 inches of crushed stone. There shall be a minimum of 1 foot from the top of the pipe to roadway surface. Pipe shall be laid to grade shown (minimum of 1% grade).

2.4 POURED-IN-PLACE CONCRETE WORK

2.4.1 General - The work covered by this Section shall consist of furnishing, erecting and removing concrete forms; furnishing, proportioning and mixing concrete ingredients and placing and furnishing plain and reinforced concrete and all other work incidental thereto as required for the proper construction of the structures shown on the Drawings or specified herein.

Concrete shall be composed of cement, fine aggregate, coarse aggregate and water proportioned and mixed to produce a plastic, workable mixture.

Notify trades that may have items embedded in concrete or that require openings in concrete by giving placing schedule.

Inform Engineer of placing schedule to allow sufficient time for inspecting prior to starting to place concrete.

2.4.2 Concrete Materials

Cement shall be Standard Portland Cement or High-Early Strength Portland Cement, conforming to all of the requirements of the American Society for Testing Materials, Standard Specifications, Serial Designation C-150, latest revision, for Portland Cement, Types I and III. High-Early Strength Portland Cement, Type III shall be used only when specifically authorized by the Engineer.

Fine and Coarse Aggregate shall conform to the requirements of the American Society for Testing Materials Standard Specifications, Serial Designation C-33, latest revision, for Concrete Aggregate.

Fine Aggregate shall be river sand, ASTM C-33.

Coarse aggregate shall be crushed limestone ASTM C-33, 1-inch size.

Water used in mixing concrete shall be fresh, clean and free from injurious amounts of oil, acid, alkali, vegetable, sewage and/or organic matter.

Curing Compounds - "Masterseal" or water cure.

Membrane - Polyethylene film, 0.066 inch thick, or greater.

Form Ties - Use metal snap ties with snap cones on both exterior faces of the wall. Snap cones to be 3/4-inch minimum depth. Ties to be Richmond, Burke, or equal.

Air Entraining Agent - ASTM C-260.

Expansion Joint Filters - Exterior: ASTM D-1751, ½-inch.

Ready-Mix Concrete - ASTM C-94.

Reinforcing - ASTM Designation A-15 - Grade 50.

2.4.3 Strength and Proportioning

Concrete ingredients shall be selected, proportioned and mixed to produce a workable homogeneous concrete within the following limiting requirements:

1. Class A - 4,000 psi minimum compressive strength at 28 days - minimum of 6.0 bags of cement per cubic yard, air entrained, with maximum water: cement ratio of 0.42. Class A concrete to be used in all structures, including base slabs.

2. Class B – 4,000 psi minimum compressive strength at 28 days – minimum 6.0 bags of cement per cubic yard with maximum water: cement ratio of 0.45. Class B concrete to be used in all structures, including base slabs, wall and structural slabs not exposed to the elements.

3. Class C - 2,000 psi compressive strength at 28 days – minimum of 4.5 bags of cement per cubic yard. Class C concrete to be used below grade for pipe kickers, encasement, braces, fillets, cradles and used to fill voids or for backfilling operations.

4. Class D – 5,000 psi minimum compressive strength at 28 days grout mix – minimum 9.0 bags of cement per cubic yard and only fine aggregate. Class D grout mix to be used at first lift, approximately 6 inches at bottom of walls with waterstops.

The amount of moisture carried on the surface of the aggregate particles shall be included in calculating the water content of each mix. In all cases, however, the amount of water to be used shall be the minimum amount necessary to produce a plastic mixture of the specified strength and of the desired durability, density and workability. In general, the slump shall be between 2 inches and 4 inches, and in no case shall it be more than 4 inches, when determined in accordance with the American Society for Testing Materials Standard Method, Serial Designation C-94, "Slump Test of Consistency of Portland Cement Concrete."

The total volume of aggregate to be used in each cubic yard of concrete shall be determined by recognized standards for designing concrete mixes, utilizing the actual screen analysis of the aggregates.

The exact proportions of concrete ingredients within the limits herein specified shall be varied to conform to the varying quality of the ingredients. The proportions shall be changed whenever such changes become necessary to obtain the specified

and desired workability, density, and uniformity. The Contractor shall not be compensated for any such changes unless they involve the use of cement in excess of the maximum herein specified.

No other admixtures of hardening or curative materials shall be used unless such use has been authorized in writing by the Engineer, except that air entrainment will be used.

Concrete shall be air entrained concrete, containing 4% to 6% entrained air. The air entraining agent shall be Master Builders MB-VR or Gifford-Hall Artite AEA.

Trial Batch Testing/Approval:

The Contractor shall determine the source, kind and quality of the cement and aggregates to be used in the work well in advance of the time scheduled for starting the work and will have an independent laboratory prepare and test a design mix to conform with conditions as specified herein. Test cylinders will be made and tested at the 7th day and 28th day interval. The trial batch will be submitted in duplicate to the Engineer for approval at the end of the 7th day break.

Cement and aggregates shall be tested by a recognized testing laboratory which has been approved by the Engineer.

No cement or aggregates shall be incorporated in the work prior to receipt and approval of certified test reports by the Engineer.

The cost of sampling and testing cement, aggregates and trial batch shall be borne by the Contractor.

2.4.4 Preparation for Concrete Placement

Forms shall be of wood, steel or other approved material. Unless otherwise specifically authorized, the sheeting for all exposed surfaces shall be plywood of uniform width. The type, size, shape, quality of all materials of which the forms are made shall be subject to the approval of the Engineer. Forms for permanently exposed walls shall be at least 4' x 8' in size and shall be lined with Masonite or similar material to avoid intermediate form marks. The Contractor will be responsible for the structural strength of all forms and shoring.

Forms shall be built true to line and grade and shall be mortartight and of sufficient strength and rigidity to prevent displacement or sagging between supports. Form surfaces shall be smooth and free from irregularities, dents, sags, or holes. Bolts and rods used for internal ties shall be arranged so that when the forms are removed, no metal will be less than 3/4-inch from any concrete surface. Break excess metal off--fill hole with sand cement grout. Provide inspection holes as required for cleaning purposes. Coat forms with non-staining oil or wet forms prior to pouring concrete.

Do not remove forms until concrete has attained sufficient strength to support its own weight and superimposed loads.

Embedded items shall be firmly and securely fastened in place. They shall be thoroughly cleaned and free of any coating, rust, scale, oil or other foreign material.

Construction joints shall be formed only where shown on the Drawings, unless otherwise directed by the Engineer. Concrete at the construction joints shall have been placed not less than 12 hours before concrete is placed on or adjacent to it.

Expansion and contracting joints shall be constructed where shown on the Drawings and, except where specifically otherwise shown, shall be made by the use of premolded expansion joint filler ½-inch in thickness and of the full length of the joint.

Prior to the placing of any steel reinforcement in the work the Contractor shall submit to the Engineer written evidence to the effect that such steel has been tested under and is in conformity with these Specifications unless testing is specifically waived by the Engineer. Certified true copies of test and acceptance reports by a responsible testing laboratory shall be considered as evidence of compliance.

Complete detailed shop drawings, bending diagrams and schedules of the steel to be used in the work shall be submitted by the Contractor to the Engineer for review and approval prior to the fabrication of the steel. All steel which fails to meet these Specifications of which has been improperly cut or bent, or which does not conform to the sizes shown on the Drawings shall be rejected.

Before being placed in position, all steel reinforcement shall be thoroughly cleaned of oil, mill and rust scale and other coatings that would tend to destroy or reduce the bond. Where there has been a delay in depositing concrete after the reinforcement has been placed it shall be reinspected and re-cleaned if necessary.

Reinforcement shall be accurately positioned and secured against displacement by using annealed or similar wire of not less than No. 18 gauge and shall be supported by concrete or metal chairs, stays, spacers, hangers or other approved supports which shall have sufficient strength and stability to maintain the reinforcement in place throughout concrete operations. Bricks, stones, stakes or similar materials shall not be used in lieu of chairs, hangers, etc.

Reinforcement spacing and embedment shall conform to ACI Standard 318, "Building Code Requirements for Reinforced Concrete." Where splicing is necessary, the rods shall be lapped not less than 30 diameters, and splices shall be staggered. All supports and ties shall be placed in such manner that they will not be exposed on the face of the concrete nor discolor the surface of the finished concrete.

2.4.5 Concrete Mixing, Delivery and Placement

Concrete shall be Ready-Mix furnished from an approved supplier in accordance with ASTM C-94.

Before placing concrete, form shall be clean and thoroughly oiled with non-staining mineral oil. Concrete shall not be placed until forms and reinforcement have been checked and approved by the Engineer.

Unless otherwise specified, all concrete shall be placed in the dry upon clean, damp surfaces, free from water, and never upon soft sand, mud or dry porous earth.

Moistureproof vapor barriers (membranes) of polyethylene plastic sheets equal to Visqueen or other approved material shall be placed under all slabs poured on grade, whether shown or not, unless its omission is authorized by the Engineer. Such vapor barriers will not be required for manhole slabs.

Concrete shall be handled from the mixer to the place of final deposit as rapidly as possible and by facilities which will prevent loss or segregation of concrete. Under no circumstances shall partially hardened concrete be placed in the work. Concrete shall be placed in the forms in as near its final location as possible and shall be placed in continuous horizontal layers not more than 12 inches deep. The maximum time lapse between placement of successive layers shall be 30 minutes. After the concrete has been deposited, it shall be distributed over the entire area within the forms in horizontal layers as quickly as possible. It shall be compacted and worked into all corners and angles and around reinforcements and embedded fixtures in such manner as will fill all voids, prevent honeycombing against the form and prevent segregation of coarse aggregate.

Concrete in general shall be placed with the aid of mechanical vibration equipment. Vibration shall be transmitted directly to the concrete and, in no case, shall it be transmitted through the forms. The frequency of vibration shall not be less than 3,600 per minute. Vibration shall be supplemented by forking or spading by hand adjacent to the forms on exposed faces.

Water accumulating during placing shall be removed; under no circumstances will concrete be placed in such accumulations.

Before depositing new concrete on or against hardened concrete, the surface of the hardened concrete shall be thoroughly roughened, cleaned, and saturated with water. The surface shall then be coated with mortar against which the new concrete shall be placed before the grout has attained its initial set.

In the event of any emergency which prevents completion of a pour, the Contractor shall provide a vertical keyed bulkhead and the horizontal joint shall be treated as any other horizontal construction joint.

2.4.6 Curing and Protecting Concrete

All concrete shall be kept wet for a period of 7 days by covering with water or an approved water-saturated covering, or by other approved methods which will keep all surfaces continuously wet.

In cold weather concrete shall be mixed and placed only when the temperature is at 40 degrees F or above, and rising, unless specifically authorized by the Engineer. In freezing weather, suitable means shall be provided for maintaining the concrete at a temperature of at least 50 degrees F for a period not less than 72 hours after placing or until foreign materials shall not be mixed with the concrete for the purpose of preventing freeze.

2.4.7 Testing Of Concrete

During concrete placement, Contractor shall make test cylinders--generally 3 cylinders for each 100 cubic yards or major pour. These test cylinders are to be

furnished, made, cured and transported to laboratory by Contractor. Laboratory will be selected by the Owner as approved by the Engineer. The laboratory cost of testing will be paid by the Owner.

Sampling, handling and testing of concrete cylinders shall conform to applicable ASTM Specifications.

Break one cylinder at 7 days, one cylinder at 28 days. If both cylinders meet required strength, break remaining cylinder at 28 days. If second cylinder fails to meet required 28-day strength, hold third cylinder for 60-day break. If first cylinder is low, extend curing period as directed by Engineer.

2.4.8 Finish

All permanently exposed surfaces shall be given a rubbed finish immediately after removing forms and in no case not later than 10 days after placement of the concrete unless permitted otherwise by Engineer's approval. Small voids shall be filled with mortar (1 part cement, 2 parts sand), pressed into holes and floated smooth. Plastering and steel troweling of surface shall not be permitted. Imperfect surfaces shall not be patched but shall be repaired by removal and replacement of the member.

Rubbing shall be done with Number 20 Carborundum stone and shall be continued until all lines, markings, and surplus material have been removed from the surface and the surface shows a uniform, smooth finish. After rubbing is completed, the concrete surface shall be washed clean with water. Should the Contractor not be able to remove form marks to the Engineer's satisfaction, he will be required to paint or replace the surface as directed by the Engineer.

No special concrete or cement mortar topping course shall be used for slab finish unless so shown on the Drawings. The base slab shall be brought to a true and even finish by power or hand floating. Where a trowel finish is required as shown on the Drawings, it shall be done with steel trowel in such a manner as to produce a dense, smooth, impervious surface, free from blemishes.

2.5 SHOTCRETE

2.5.1 All shotcrete shall be applied by or under direct supervision of experienced nozzlemen who hold current certification in accordance with ACI CP60

2.5.2 Shotcrete Material – All shotcrete material shall conform to the recommendations of ACI 301, 350R and 506.2. Mix proportions shall be submitted to the purchaser and shall meet the strength requirements and physical properties of the purchaser's specifications. For corrosion protection of the steel reinforcement, concrete or shotcrete used in the core wall, top slab, or dome, and shotcrete for covering prestressed wire or strand, shall not contain watersoluble chloride ions in excess of 0.06 percent of the weight of the cement in the mix as determined by ASTM C1218/C1218M.

2.5.3 Shotcrete Mixes

Either the wet-mix or dry-mix process referred to in ACI 5006R shall be used for shotcreting unless specified process is required. Shotcrete shall be proportioned for a 28-day strength equal to that for which the core wall is designed but not less than 4,000 psi unless otherwise specified.

Shotcrete mixes, measured by weight, shall be:

First coat on steel shell Diaphragm and prestressed wire:	1 part cementitious material to 3 parts sand
All other shotcrete:	1 part cementitious material to 4 parts sand

Up to 20 percent of cementitious materials may be fly-ash.

2..5.4 Each shotcrete layer shall be broomed prior to final set to effect satisfactory bonding of the following layer. No shotcrete shall be applied to reinforcing steel or diaphragm that is encrusted with overspray. No less than 1/8-inch thick shotcrete shall separate reinforcing steel and prestressing wire.

2.6 RESERVOIR FOUNDATION

2.6.1 General

The reservoir foundations shall be designed and constructed fully in accordance with AWWA D110-04 Section 4.9 for Wire- and Strand-Wound Circular, Prestressed Concrete Water Tanks, except soil investigation shall be provided as described herein below specifics.

The reservoir Contractor, within 28 days of execution of the Agreement, shall submit foundation drawings to the Engineer for approval and for use by the Contractor constructing the foundations. The Drawings show the anticipated details of construction; however, in order to ensure the foundation being suitable for the reservoir actually furnished, the foundation must be built from drawings certified by the reservoir manufacturer and approved by the Engineer.

Upon completion of the tank foundation, the Contractor shall notify the Engineer and allow sufficient time for the Engineer to inspect the completed foundation before any backfilling is done.

2.6.2 A subsurface soil investigation will be required by the Tank Contractor to determine the soils bearing pressure for the design of the foundation. A minimum of three (3) borings should be drilled with one at the tank center and two (2) at 180 degrees apart on the foundation circle diameter at a depth of 30 feet. The report will be written on the results of the test, and this will form the basis of the design. The investigation shall be completed by a qualified and independent geotechnical engineer. **All cost required for the subsurface investigation and report shall be the responsibility of the contractor.**

A soil condition of 4,000 psf bearing strength at 5-feet below grade shall be assumed in design of foundation for bidding purposes. After the Contract is awarded, the Contractor shall provide the Engineer with the soil test results.

2.6.3 Design

The tank floor shall be of concrete or shotcrete construction containing no less than 0.625 percent reinforcing steel in each orthogonal direction.

Concrete strength shall be at least 4,000 psi (28-day compressive strength). The quantity of concrete and reinforcing steel to be provided in the foundations shall be based on a ringwall type foundation assuming soil suitable for 4,000 lbs. per sq. ft. bearing pressure with unit price per cubic yard of Class A concrete and per pound or reinforcing steel provided for adjustment of lump sum bid in case of increase or decrease in quantities required as a result of the permissible soil bearing being appreciably greater or less than 4,000 lbs. per sq. ft.

2.6.4 Construction Details - The foundation shall be constructed in accordance with details shown on the Drawings, as provided by the reservoir Contractor and in accordance with AWWA D110-04 standards.

2.7 WATER PIPE - The piping, valves and piping appurtenances shall be constructed in accordance with the details of the Drawings. Water lines, valves and fittings shall be ductile iron conforming to the following Specifications. The limits of site piping under the Agreement shall be as shown on the Drawings and described in Section H - Water Mains and Appurtenances.

2.8 FINAL SITE WORK

After completion of all piping and reservoir work, the site shall be cleaned of all debris left from the Contractor's operations. Final grading shall be done in accordance with contours as shown on the Drawings. The access road shall be brought to finish grade and the wearing surface applied. All drainage structures shall be completed, cleaned of any mud, silt, etc. and left in good condition. Seeding and landscaping shall be done in accordance with the project specification and landscaping notes, if any, contained on the Drawings.

2.9 CHAIN LINK FENCE

2.9.1 General

Furnish and install new chain link fencing and gates at the locations indicated. Fence fabric shall be 6 feet high.

Chain link fence shall be topped with 3 strands of barbed wire pointing away from the enclosed area.

Submit shop drawings showing details of fence fabric, posts, rails, gates, fittings, and locking devices. Submit certification of test results when requested.

Painting of chain link fencing will not be required.

2.9.2 Galvanized Fencing

Fence fabric shall be No. 9 steel wire, hot galvanized after weaving, and woven in a 2-inch chain link pattern with bottom and top selvages twisted and barbed. Wire shall have a minimum breaking strength of 1,200 lbs. Wire fabric shall withstand six one-minute immersions under the Preece copper sulphate method of testing for uniformity and weight of coating.

Framework shall be hot-dipped galvanized with a minimum coating of 2 ounces/sf or one ounce/sf plus 30 micrograms/square inch cromate conversion coating.

Line posts shall be 2.25 x 1.70-inch formed C-section, ASTM A-570 Grade 45 steel, 2.6 lbs/ft; or 2.37-inch outside diameter round post, ASTM A-569, cold rolled steel with a minimum 50,000 psi yield strength, 3.1 lbs/ft; or 2½-inch outside diameter, 3.7 lbs/ft steel pipe.

End corner, angle, and pull posts shall be 3.50 x 3.50-inch formed C-section, ASTM A-570 Grade 45 steel, 4.85 lbs/ft; or 2.87-inch round post, ASTM A-569, 4.64 lbs/ft; or 3-inch outside diameter, 5.79 lbs/ft steel pipe.

Top rails shall be 1.65 x 1.25-inch formed C-section; or 1.6-inch round ASTM A-569, 1.35 lbs/ft; or 1⅝-inch outside diameter steel pipe, 2.27 lbs/ft. Top rails shall pass through openings provided for that purpose in post tops.
Fabric ties shall be hog rings, galvanized steel wire not less than 9-gauge with a zinc coating of not less than 1.2 ounces/sf.

Bolts and nuts shall be in conformance with ASTM A-307 and shall be galvanized in accordance with AASHTO M-232.

Pressed steel extension arms shall be provided at posts, extended at an angle of 45 degrees, to which 3 rows of barbed wire of 4-point pattern in 2 strands of 12½-gauge wire shall be fastened.

Install horizontal braces fabricated of 1⅝-inch, 2.27-lb copper bearing steel pipe at all corner, gate, and end posts.

Gates shall be sized and located as shown. Swing gate posts for double gates shall be 4-inch, 9.1-lb pipe. Gate frames shall be made of 2-inch outside diameter, 2.72-lb. hot-dipped galvanized pipe. Corner fittings shall be heavy malleable iron castings. Fabric shall be the same as for the fence. Gates shall have malleable iron ball and socket hinges, catches, stops, and padlocks with 3 keys each. Posts for single gates shall be the same as end posts.

2.9.3 Installation

Install chain link fence in accordance with the directions of the manufacturer and these Specifications.

Install fence posts at not more than 10-ft centers and at least 36 inches into the ground in a Class C concrete base. Allow concrete to cure for at least 7 days before erecting remainder of fence. Fasten fabric to line posts with wire ties spaced about 14 inches apart and to top rail spaced about 24 inches apart.

Use standard chain link fence stretching equipment to stretch the fabric before tying it to the rails and posts. Repeat the stretching and tying operations about every 100 feet.

Erect gates so they swing or slide in the direction indicated. Provide gate stops. Secure hardware, adjust, and leave in perfect working order. Adjust hinges and diagonal bracing so that gates will hand level. Adjust rollers and guides of sliding gates so that gates are level.

At small natural or drainage ditches where it is not practical for the fence to conform to the contour of the ground, span the opening below the fence with barbed wire fastened to stakes of required length. The finished fence shall be plumb, taut, true to line and ground contour, and complete in every detail. When directed, stake down the chain link fence at several points between posts.
Where new fence joins an existing fence, set a corner post and brace post at the junction and brace. If the connection is made at other than the corner of the new fence the last span of the old fence shall contain a brace.

WATER STORAGE RESERVOIR AND APPURTENANCES

SECTION 3

PRESTRESSED CONCRETE RESERVOIR DESIGN AND ERECTION

1. GENERAL

The Contractor shall be a specialist in the design and construction of wire- and strand-wund , circular, prestressed composite tanks and shall have built, in its own name, not less than 5 comparable prestressed tanks now giving satisfactory service.Such company shall have on its staff a full-time professional engineer with not less than 5 years experience in design and field construction of circular prestressed composite tanks and who will be the responsible engineer in charge of the work to be done. All design calculations and construction or shop drawings shall carry the seal of a registered professional engineer.The reservoir shall be fabricated and erected by an established firm experienced in the design and construction of similar tanks for potable water service. No Contract will be awarded unless the Bidder can present satisfactory evidence of having designed and erected similar reservoirs for potable water service.

The tank supplier shall accept full responsibility for the design, fabrication, delivery and construction of the tank and supporting structures including the foundation.

2. PRESTRESSED CONCRETE RESERVOIR

The wate storage reservoir shall be designed, manufactured, and erected in accordance with AWWA D110-04, latest revision, for wire-wound, circular, prestressed concrete water tanks.

The water storage reservoir shall be composite steel-shotcrete, wire wound prestressed construction as specified below. The wall and dome ring shall be of composite construction consisting of a shotcrete core wall with a continuous steel shell embeddied therein. The floor shall be concrete or shotcrete containing not less than 0.6% reinforcing steel. The dome shall be of mesh-reinforced shotcrete or concrete with not less than 0.25% reinforcing. All prestressing shall be done with high-tensile wire in which a substantial allowance shall be made for loss of prestress due to shrinkage and to relaxation in the steel.

2.1 Design Criteria and Construction Details

The thickness of the core wall shall be calculated so as to accept the initial compressive forces applied by prestressing, hydrostatic stresses induced by comtents, and other apllicable loads such as soil backfill and wind.

Backfill loads shall not be used in the design of the core wall to counteract hydraulic loads or provide residual compression in the wall.

The design shall be in conformance with American Concrete Institute (ACI) Title 334R-W "Design and Construction of Circular Wire and Strand Wrapped Prestressed Concrete Structures," and currently accepted engineering principles and practices for the design of such facilities.

Design criteria shall be as shown below or as approved by the Engineer:

Shotcrete:

fc should be equal to or less than 2,000 psi
f'c should be equal to or greater than 4,000 psi
fci should be equal to or less than 0.55 f'ci at winding

Prestress Wire

Diameter should be equal to or larger than 0.162" (8 gauge)
fs wall – 115,000 psi
fs dome – 120,000 psi
fsi – 145,600 psi or no greater than 0.75 fsu
fsu should be equal to or greater than 230, 000 psi

Reinforcing Steel

Allowable Tensile Stress - fs – 18,000 psi
Yield Strength – fy – 60,000 psi

All parts of the tank structure, including foundations, shall be designed to withstand the following loads acting separately or in combination with an adequate factor of safety:

Dead Load shall be the estimated weight of all permanent construction and fittings.

Live Load shall be the weight of all of the liquid when the tank is filled to top capacity level or overflowing.

Snow Load shall be determined in accordance with AWWA D110-04 for Wire-Wound Circular Prestressed Concrete Water Tanks.

Wind Load or pressure shall determined in accordance with AWWA D110-04 for Wire-Wound Circular Prestressed Concrete Water Tanks for a wind velocity not less than 100 MPH.

Seismic Load shall be in accordance with AWWA D110-04 for Wire-Wound Circular Prestressed Concrete Water Tanks. The Seismic Zone for this tank site is assumed to be Zone 1 for bidding purposes.

Balcony and Ladder Load shall be as computed in accordance with AWWA D110-04 for Wire-Wound Circular Prestressed Concrete Water Tanks.

2.2 Core Wall

2.2.1 The core wall shall be constructed of shotcrete, encasing a steel diaphragm continuous the full wall height without horizontal splices and placed in accordance with standard practices. A descritpion of shotcrete practice is contained in the "Concrete Manual" issued by the Department of the Interior, Bureau of Reclamation and in the ACI Bulletin 506, "recommended Practices of Shotcreting."

The thickness of the core wall shall be calculated so as to accept the initial compressive forces applied by prestressing, backfill, and other applicable loads. The wall may taper uniformly on the outside face from top to bottom as required by design computations. In no case shall the core wall be less than 3½ inches thick. Horizontal sections of the wall shall form true circles without flats, excessive bumps, or hollows.

To compensate for bending moments and for shrinkage, differential drying, and temperature stresses, the following reinforcing steel shall be incorporated in the core wall:

a. The top 2 feet of the core wall shall have not less than 1 percent circumferential reinforcing.

b. The bottom 3 feet of core wall shall have not less than 1 percent circumferential reinforcing

c. The inside face shall have 26 gauge steel shall diaphragm continuous the full wall height without horizontal splices. Additional vertical and horizontal reinforcing steel bars as required by design computations.

d. The outside face shall have vertical reinforcing steel of minimum #4 bars at 12-inches on center. Additional vertical and horizontal reinforcing steel bars as required by design computations.

Interior and exterior surfaces of the core wall shall be water cured until prestressing starts.

2.3 Dome Roof

2.3.1 The dome roof shall be constructed of reinforced concrete, circumferentially prestressed. Dome shall reinforcement shall consist of reinforcing steel bars or welded wire fabric meeting ASTM A-185, not galvanized. Bolsters for wire fabric and reinforcing bars shall be plastic tipped. Wire ties shall be galvanized.

The dome shall shall be designed as a free span, spherical thin shell, with a one-tenth rise. The dome ring girder shall be prestressed with sufficient wire to withstand the dome dead load and design live loads. The ring girder shall have a cross section suitable to accept the applied prestressing forces. Allsurfaces in the wall/dome ring girder joint shall be coated with an approved bonding epoxy.

The high water level in the tank shall be permitted to encroach on the dome shell no higher than the upper horizontal plane of the dome ring girder. Overflow outlets shall be installed on the dome roof in such numbers as will provide on overflow open area three times the area of the largest tank pipe.

2.3.2 The typical ome thickness and steel reinforcement shall meet the requirements of AWWA D-110-04, Section 3.6.3, *Thickness and reinforcement*. In all cases, the thickness of the dome shall be no less than 3-inches.

2.3.3 The dome edge and upper wall shall be designed to resist the monents, thrusts, and shears that occur in this region due to dome and wall prestressing and loading conditions. The following design parameters shall be used:

1) Dome Edge Thickness:

a. A determination of the buckle diameter shall be made, as defined by:

$$d_b = 2.5 \bullet \sqrt{r_d \bullet t_d}\text{, rounded up to the next foot}$$

Where: d_b = buckle diameter in feet
r_d = dome radius in feet
t_d = typical dome thickness in feet

b. Dome edge thickening shall begin at a radial location on the dome, defined as s_2 which is at least one buckle diameter away from the tank wall.

c. A springline hauch shall be provided, which extends radially from the inside face of the tank wall to radial location s_1, which is defined as:

$$s_1 = 0.6 \bullet \sqrt{1.5 \bullet r_d \bullet t_d}, \text{ rounded up to the next foot}$$

This springline hauch shall begin at the inside face of the tank wall with a springline thickness as required by AWWA D110-04, Section 3.6, *Dome Roof Design.*

d. Dome shell shall be a straight line taper.

e. Sufficient concrete thickness at the springline of the dome shall be provided so that no more than 2 feet of the springline hauch is considered in calculating the effective dome edge ring cross sectional area. Compressive stress in this are shall not exceed 1,000 psi when subjected to initial prestressing, offset by deal load only.

2) Dome Edge Steel Reinforcement:

a. Throughtout the dome edge, the percentage of steel reinforcement, both radially and circumferentially, shall be no less than 0.25 percent of the gross cross sectional area of concrete.

b. Along the dome edge, steel reinforcement shall be distributed between the upper and lower layers unless finite element analysis calculations indicate that tensile stress does not exist in the concrete along the bottom face of the dome edge. In that case, only top bars are required radially and circumferentially. In adition, radial and circumferential reinforceing bars will not be required along the bottom face of the dome where the calculated typical dome thickness is less than 75 percent of the actual dome thickness.

c. Where reinforcing bars are required in the bottom layer, they shall be anchored near the tank wall to insure adequate development at the intersection between dome and wall

d. In all cases, the percentage of circumferential stress reinforcement in the first two feet of the dome edge shall be no less than one percent of the gross cross sectional area of concrete/

e. Where bottom dome edge steel reinforcement is required, vertical steel reinforcement along the inside face of the tank wall shall be no less than 0.5 percent of the cross sectional area of wall shotcrete.

2.4 Steel Tank Shell

A 26 gauge steel tank shell, complying with ASTM A-366 (latest revision) for commercial-quality cold-rolled steel shall be used within and thoughout the core wall, providing a positive waterstop. The steel shell diaphragm shall be encased and protected with shotcrete no less than one-inch thick at all places. The steel shall is to be formed and erected that a strong mechanical key between shotcrete and diaphragm will

be created. The sheets of steel diaphragm shall be continuous from top to bottom of wall; horizontal joints or splices will not be permitted.

All vertical joints in the diaphragm shall be sealed watertight by epoxy injection. Epoxy injection shall be carried out from bottom of wall to top of wall, using a pressure pumping procedure, after the steel shall has been fully encased, inside and outside, with shotcrete. The epoxy sealant shall be suitable for bonding to concrete, shotcrete, and steel. The sealant shall conform to the requirements of ASTM C 881, Type III, Grade 1, and shall be a 100 percent solids, moisture insensitive, low modulus epoxy system. When pumped, maximum viscosity of the epoxy shall be poises at 77 degrees fahrenheit.

The steel shell design and its epoxy injection procedure shall have been used in the five tanks required in the Contractor's experience record. No nail or other holes shall be made in the metal shell before, during, or subsequent to, or for the purpose of erection, except for inserting pipe sleeves, reinforcing, bolts, or other special appurtenances. For all tanks designed to use a waterstop at the floor/wall joint, the steel shell diaphragm shall be epoxy bonded to this waterstop.

2.5 Floor Design

Floor may be either structural or membrane type.

2.5.1 Structural Floors

Structural floors shall be properly reinforced for supporting the tank contents, resisting hydrostatic uplift forces, and for unusual foundation conditions where conditions are warratned based on AWWA standards and as directed by Tank design Enginner based on soils conditions. Structural reinforced concrete floors shall be designed according to the requirements of ACI 318 and ACI 350R with special attention to crack control. Anchorage to underlying foundation strata or sufficiently heavy concrete floor system may be required to provide a satisfactory solution to hydrostatic uplift.

2.5.2 Membrane Floors

Concrete membrane floors shall have a minimum thickness of 4-inches and shall have a minimum thickness of 8-inches of concrete over all pipe encasements and around sumps. Floors shall be placed continuously in sections as large as practicable to decrease the length of construction joints and potential leakage problems. The minimum percentage (0.625%) of reinforceing steel applies to these thickened sections and shall extend a minimum of 2 feet into the adjacent membrane floor.
Floors shall be vbratory sceened to effect consolidation of concrete and proper encasement of floor reinforcing steel.

Floors shall be continuously water cured until tank construction is completed.

Hydrostatic uplift when the tank is empty or when the tank water level is lowered during operation shall be precluded by adequate surface drainage, perimeter drain around tank wall foundation, or underdrainage as is necessary. For crack control in the floor, the minimum reinforcement in each direction in the horizontal plane shall be 0.625% of the concrete area.

2.5.3 Watertightness

Where construction or expansion joints are provided in floors, waterstops shall be used to ensure watertightness under a head of water equal to the height of the tank. An acceptable joint sealant shall be used in addition to the waterstop to prevent entry of foreign material into the joint and to ensure it performance. The slab at the joint may be thickened to allow space for the waterstop and reinforcement. For a restrained joint, the reinforcement shall be continuous through the joint. Additional nonprestressed reinforcement shall be provided in the thickened portion of the slab plus 2-feet of the subsequent placed membrane slab parallel to the construction joint to control cracking. Alternate designs with nonrestrained joints are acceptable, provided the watertightness criteria are met.

2.5.4 Subgrade

The subgrade for membrane floors must be of uniform density and compressibility to minimze differential settlement of the flor and footings. Disturbed subgrade or loosely consolidated soil or foundation material shall be removed and replaced with suitable compacted soil, or it shall be compacted in place. Compaction shall achieve a density of at least 95 percent of the maximum laboratory density determined by ASTM D1557. Overexcavation and replacement with compacted imported material may be required if foundation soils are unsatisfactory for the imposed loadings or do not provie uniform support.

The subgrade for all types of floors shall be so designed that leakage through the floor will not cause erosion and settlement in excess of that provided for in the design or will not cause other types of failure.

Floor base shall be of a clean well-compacted granular base with a minimum thickness of 6-inches shall as required by AWWA D110-04, Section 3.8.5.

2.6 Horizontal Prestressing

Circumferential prestressing of the tank shall be achieved by the application of cold-drawn, high-carbon steel wire complying with ASTM 821-93 Type B, placed under high tension. A substantial allowance shall be made for prestressing losses due to shrinkage and plastic flow in the shotcrete and due to relaxation in the prestressing steel.

Placement of the prestressing steel wire shall be in a continuous and uniform helix of such pitch as to provide in each lineal foot of core wall height an initial force and unit compressive stress equivalent to that shown on the drawings. Splicing of the wire shall be permitted only when completing the application of a full coil of wire, or when removing a defective section of wire.

Areas to be prestressed will contain not less than ten (10) wires per foot of wall for eight (8) gauge and eight (8) wires per foot of wall for six (6) gauge. A maximum of 24 wires per layer per foot for eight (8) gauge and 20 wires per layer per foot for six (6) gauge will be allowed. Shotcrete shall be used to completely encase each individual wire, and protect it from corrosion. To facilitate this encasement, the clear space between adjacent wires is to be no less than one wire diameter.

Prestressing shall be accomplished by a machine capable of continuously inducing a uniform initial tension in the wire before it is positioned on the tank wall. Tension in the wire shall be generated by methods not dependent on cold working or re-drawing of the wire. In determining compliance with design requirements, the aggregate force of all

tensioned wires per foot of wall shall be considered rather than the force per individual wire, and such aggregate force shall be no less than that required by the drawings.

No circumferential movement of the wire along the tank wall will be permitted during or after stressing of the wire. The steel wire bands on the core wall and dome ring shall be so placed tha the prestress "working force" per foot of wall height shall exceed the hydraulic ring tension force by not less than 5%. The "working force" shall be defined as the force determined by multiplying the area of the steel wire by the unit wire stress after an allowance for losses of 20,000 psi has been made from the initial unit wire stresses. Such initial unit wire stress readings shall be made the same day the wire is placed or if made later and after some stress loses have already occurred due to creep of wire, plastic flow and shrinkage of core wall, allowances shall be made for such losses.

2.7 Stress Measurement

The Contractor shall supply, at his own expense, special equipment at the job site capable of measuring the stress in the wire after it is in place on the wall. The stress-measuring equipment shall consist of a stressometer, complete with an accurate dial indicator to within 2 percent, calibrated dynamometers, and a test stand to calibrate the stressometer from time to time. The initial tension in each wire shall be recorded.

2.8 Wall and Pipe Openings

All pipes shall pass into the tank through the floor in accordance with details as shown on the Drawings or in accordance with the details shown on shop drawings reviewed by the Engineer.

A minimum of two (2) 24" circular access manhole shall be provided approximately 3 feet above the base of the tank floor as shown on the Contract Drawings. Accessway is to be constructed of stainless steel. Accessway cover shll be hinged, equipped with a locking mechanism, and a grab bar.

The saccessway shall be reinforced to comply with AWWA D110-04, Section 3.11 for Waire-Wound Circular Prestressed Concrete Water Tanks and all portions of the accessway, including the cover and reinforcing of the neck, shall be designed to withstand the weight and pressure of the tank contents.

2.9 Reinforcing

Wire for prestressing: Steel wire for prestressing shall be a cold-drawn high carbon wire complying with ASTM designation A-227, Class II (latest revision), and shall give a minimum ultimate tensile strength of 230,000 psi.

Mesh Reinforcement: The wire mesh used shall be electrically welded and shall comply with ASTM designation A-185 (latest revision), not galvanized.

Vertical Reinforcin: Vertical reinforcing to compensate for shrinkage, temperature, and vertical bending moments in the core wall shall be as follows:

Inside face – A 26-gauge continuous steel shell and reinforcing steel bars as required by design computations.

Outside face – As required by design computations. Minimum of #4 bars at 12-inches center to center.

2.10 Roof Hatches

One raintight roof hatch shall be placed near the outside tank ladder and shall be provided with a hinged cover and a hasp for locking. The opening shall be a minimum of 2.5-feet square and allow access from the roof to the interior of the tank. The opening shall have a curb at least 4-inches high, and the cover shall have a 2 inch downward edge to aid in carrying water away from the roof opening. Frames and covers shall be fiberglass or aluminum at least 3/16-inch thick.

Access to roof hatch and tank vent shall be provided with handrails and walkways in compliance with OSHA safety regulations.

2.11 Tank Vent

The tank vent should be centrally located on the tank roof above the maximum weir crest elevation. The tank vent shall have an intake and relief capacity sufficiently large that excessive pressure or vacuum will not develop during maximum flow rate. The vent shall be designed, constructed and screened with stainless steel insect screen so as to prevent the ingress of wind driven debris, insects, birds and animals. The vent shall be designed to operate when frosted over or otherwise clogged. The screens or relief material shall not be damaged by the occurrence and shall return automatically to operating position after the blockage is cleared.

Tank vent screens shll have protection from vandalism and accessible for inspection and cleaning to remove insects or airborne lint, pollen or dust.

2.12 Access Ladders

All access ladders shall conform to OSHA requirements and be provided at the following locations:

a. The outside tank ladder shall extend from a beginning 8-feet above the level of the tank bottom to the roof manhole at a location to be designated by the owner, preferably near one of the manholes.

b. An inside tank ladder from the roof hatch to the inside bottom of the tank.

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

Ladders shall be equipped with a fall arrest system meeting OSHA regulations. The system shall be Saf-T-Climb or approved equal complete with safety harnesses, locking mechanisms, lanyards and accessories for two persons. A ladder guard, Saf-T-Climb or approved equal), shall be provided. Devise shall be furnished with allnecessary accessories including two climbing belts and slides.

Exterior ladder is to be installed with safety cage and cage security gate.

2.13 Water Level Indicator

Half travel water level indicator with float, float guide, sheaves, target, target guides, and graduated markings. Float, float cable and sheaves shall be constructed of stainless steel or equal corrosion-resistant alloy. Opening in tank roof shall be suitably protected. Graduation shall be at 2-foot intervals (for 4-foot variation in water level) with numbers at 4-foot intervals (for 8-foot variation in water level).

The float shall be provided with a positive means of travel guidance. If cords or wire or similar are provided as float guides, these cords, etc. shall be anchored at the top to the roof and at the bottom to a removable anchor. This anchor roof shall be provided with one or more stainless steel eyebolts and a stainless steel cable extending from the anchor to the tank roof manhole. This anchor shall be of suitable size and shape so that it will adequately anchor the float guides, yet can be hoisted by the stainless steel cable to a height adequate to replace the float guides as necessary, then lowered to its proper position. All components of the water level indicator shall be capable of being maintained or required or replaced without the necessity of draining the tank.

2.14 Pipe Connections

Inlet-Outlet piping shall be as shown on the Contract Drawings, with outlet piping equipped with a removable silt stop.

Overflow piping shall be as shown on the Drawings or recommended by tank manufacturer. Overflow shall be sized to safely pass a flow equal to 700 gpm. A suitable weir shall be provided inside the tank with the crest located at High Water Level. The overflow shall be routed from the weir to closely match the roof contour and extend down the outside of the tank shell and supported at proper intervals with suitable brackets. The overflow pipe with flap gate and stainless steel screen shall discharge over a drainage inlet structure or splash block as shown on the Contract Drawings. The point of discharge shall be equipped with a stainless steel screen in accordance with AWWA D110-04 for Wire-Wound Circular Prestressed Concrete Water Tank requirements.

2.15 A tank identification plate shall be mounted on the tank 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

3. ERECTION

Foundation construction shall be in accordance with details shown on the Drawings. Construction requirements for the tank foundation are contained in Section 2 of this Division.

After circumferential prestressing wires have been placed by a wire-winding machine, they are to be covered with shotcrete or equivalent that will provide a minimum thickness over the wire of ¾-inch or as required by AWWA D110-04. When more than one layer of wire is required, under layers shall be covered with shotcrete of sufficient thickness to provide approximately 1/8-inch cover between layers or as required by AWWA D110-04.

Moist curing shall begin as soon as possible after placement of the overcoat. Surfaces shall be kept continuously wet for a period of at least seven (7) days. Curing may be accomplished by early fog spraying application of wet burlap or other method as approved by the Enginner.

Air contact with shotcrete surfaces shall be maintained at temperature above freezing for a minimum of seven (7) days in accordance with "Recommended Practice for Cold Weather Concreting", ACI-306, latest revision.

4. RESERVOIR COMPLETION

After the tank has been completely erected, all interior and exterior surfaces shall be thoroughly cleaned of dirt, rust and foreign matter. Paint and disinfect according to Sections 4 and 5 of this Division.

WATER STORAGE RESERVOIR AND APPURTENANCES

DIVISION 4

RESERVOIR PAINTING / COATING

1. GENERAL

This specification covers preparation of surfaces, performance and completion of painting of all exterior and interior surfaces as required by the Drawings and as specified herein.

Painting shall be done at such time as approved by the Engineer. All painting shall be done strictly in accordance with the paint manufacturer's instructions and shall be performed in a manner satisfactory to the Engineer. The Contractor must have available on the job site a copy of the paint manufacturer's recommendations covering method of application, equipment needed, recommended thinners, temperature requirements, drying and recoat times, rate of application, and other pertinent data.

Finish surfaces shall be free of streaks, runs, blisters, wrinkles, abrasion, foreign matter, insects, cracks or other defects. Any evidence of improper adhesion, prolonged drying, insufficient film thickness or discoloration shall be cause for rejection and must be corrected to the satisfaction of the Engineer.

All Materials delivered to job site shall be in original sealed and labeled containers of the paint manufacturer.

All Materials used in contact with Potable Water must be approved in writing by the USEPA, NSF\ANSI and by the respective State Authority.

2. ENVIRONMENTAL CONDITIONS

Coatings shall be applied during good painting weather. Air and surface temperatures shall be within limits prescribed by the manufacture for the coating being applied and work areas shall be reasonably free of airborne dust at the time of application and while coating is drying.

3. MATERIALS

All materials shall be manufactured by the TNEMEC Co., Inc., Sherwin Williams Company, PPG or approved equal.

Equivalent materials of other manufacturers may be substituted on approval of the Engineer. Requests for substitution shall include Manufacturer's literature for each product giving the name, generic type, descriptive information and evidence of satisfactory past performance on water tanks. Submittals shall include the following performance data as certified by a qualified testing laboratory:

1. ASTM B-117 - Method of Salt Spray (Fog) Testing
2. ASTM D-149 - Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials of Commercial Power Frequencies
3. ASTM D-3359 - Method for Measuring Adhesion by Test Tape
4. ASTM D-3363 - Method for Film Hardness by Pencil Test

5. ASTM D-4060 - Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
6. ASTM D-4541 - Method for Pull-Off Strength of Coats Using Portable Adhesion Testers
7. ASTM 4585 - Practice for Testing the Water Resistance of Coatings Using Controlled Condensation
8. ASTM G-53 - Practice for Operating Light and Water Exposure of Nonmetallic Materials
9. AWWA D102 - Standard for Painting Steel Water Storage Tanks
10. SSPC-SP10 - Near White Blast Cleaning

Bidders desiring to use coatings other than those specified shall submit their proposal in writing to the Engineer at least ten (10) days prior to the bid opening. Substitutions which decrease the film thickness, the number of coats applied, change the generic type of coating, or fail to meet the performance criteria of the specified materials will not be approved. Prime and finish coats of all surfaces shall be furnished by the same manufacturer.

Materials supplied by other manufacturers may be considered for substitution if the following prevailing conditions exist:

1. Performance criteria of the specified materials are equal and detailed on the technical data sheets of each specified product.

2. Substitute materials must be for complete systems and not individual products combined with the specified materials and the performance criteria for all products within a system must meet or exceed the specified materials.

3.1 Colors.

All coatings utilized shall be certified "non-lead" as defined in Part 1303 of the Consumer Product Safety Act.

All exterior paint colors shall be certified to be lead free.

Color chart to be provided to the Engineer for color selection.

4. GUARANTEE

The Contractor shall guarantee his work for a period of one year to the extent that he shall repair any defects due to faulty workmanship or materials which may appear on the structure during this period.

A first anniversary inspection shall be conducted in accordance with AWWA Standards.

5. APPLICATION

Materials shall be mixed, thinned and applied according to the manufacturer's printed instructions and in accordance with the AWWA Standards.

Prepare surfaces in accordance with coating system's specifications. Touch up welds, burned and abraded areas with specified primer before applying field coats.

Allow each coat to dry thoroughly before applying next coat. Provide adequate ventilation for tank interior to carry off solvents during drying phase.

Finish coats shall be uniform in color and sheen without streaks, laps, runs, sags, or missed areas.

Allow a minimum of seven days curing after application of final coat to tank interior before flushing, sterilizing of filling with water.

6. ACCEPTANCE OF WORK

All surface preparation and shall be approved by the Engineer/Owner before primer is applied.

Request acceptance of each coat before applying next coat.

Correct work that is not acceptable and request reinspection.

7. CLEANUP

Remove and dispose of, in a legal manner, all rubbish or other unsightly material leaving the premises in pre-project condition.

8. STERILIZATION

The interior of the structure and riser shall be thoroughly hand-washed and sterilized in accordance with the requirements of the State Health Department and AWWA C652-02.

Bacteriological samples shall be taken and sent to the Health Department for testing. If the results are positive, the structure shall be re-sterilized as set out herein above until negative test results are obtained.

The structure shall not be placed into service until negative results are obtained.

9. PAINTING - PRESTRESSED CONCRETE TANK

9.1 The interior of the prestressed concrete tank will not be painted. The exterior shall be painted as described below:

9.2 Surface Preparation

Upon completion of the prestressed concrete tank and prior to painting as shown below in the Painting Schedule, the exterior tank surfaces shall be cleaned, including removal of efflorescence and mineral salts and otherwise prepared for painting in accordance with the paint manufacturer's recommendations.

9.3 Application of Paint

Each coating shall be approved at the rate and in the manner specified by the manufacturer. If material has thickened or must be diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with undiluted material. Deficiencies in film thickness shall be corrected by the application of additional coat(s) of paint. Application rate shall be that required to provide a smooth, even surface for finish coats. Allow curing time as recommended by the manufacturer.

9.4 Paint Schedule

Concrete Reservoir - Exterior Painting

Two Coats: Apply TNEMEC 156 - Color Enviro-Crete* Smooth

* 156 Enviro-Crete is a smooth finish to D.F.T. of 6.0 to 8.0 mils.

Color to be selected by Engineer/Owner.

All painting, recommended mil thicknesses and coverages shall be in accordance with the paint manufacturer's recommendations.

WATER STORAGE RESERVOIR AND APPURTENANCES

SECTION 5

TESTING AND DISINFECTION OF RESERVOIRS

1. GENERAL

1.1 The procedures prescribed below are based on sound sanitary engineering principals, State Health Department regulations, AWWA standards and other factors necessary to obtain disinfection of the reservoir with a minimum of potable water wasting.

1.2 The Contractor is responsible for satisfactory disinfection. If the Contractor's standard procedure differs from that described below, such procedures may be used provided prior written approval is obtained from the Owner, the Engineer and the State Health Department.

1.3 A program to maintain site free from accumulations of waste, debris, and rubbish caused by construction operations shall be conducted at all times.

1.4 When Work is complete, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials and clean all sight-exposed surfaces. Leave project clean and ready for occupancy.

1.5 The Owner will furnish at no expense to the Contractor for the first disinfection and testing process. Additional water used for subsequent refilling and testing of the reservoir shall be paid for by the Contractor.

1.6 Filling of the reservoir shall take place at a time and in a manner approved by the Owner and notice of the filling request shall be given at least 24 hours in advance of such filling.

2. DISINFECTION

Upon completion of the reservoir including painting, the Contractor shall remove all foreign materials and thoroughly clean the inside surfaces of the reservoir.

After cleaning, but before placing the new tank in service, Contractor shall disinfect the inside of the tank in accordance with AWWA Standard C-652-02, Section 4.

3. SAMPLING and TESTING

After the chlorination is completed and before the tank is placed in service, water from the full facility shall be sampled and tested in accordance with AWWA Standard C-652-02, Section 5.1 Bacteriological Sampling and Testing.

If the samples test negative, the reservoir may be put in service by the Contractor at the Owner's direction without draining the water used to disinfect the reservoir.

If the samples test positive, the Contractor shall repeat the disinfection process until negative (satisfactory) bacteriological samples are obtained. The cost of such additional

disinfection procedure including, but not limited to, additional water required and testing shall be the expense of the Contractor.

Leakage - During the 24 hour disinfection period when the reservoir is full, a leakage test shall be made. A water level drop of more than 1 inch during the 24 hour period shall be evidence of excessive leakage which must be corrected by the Contractor before acceptance by the Owner. Visible leakage shall be eliminated by the Contractor regardless of the amount.