



CALL NO. 313

CONTRACT ID. 071036

GRAYSON COUNTY

FED/STATE PROJECT NUMBER FD04 043 0062 021-023

LETTING DATE: July 27, 2007

Sealed Bids will be received in the Division of Construction Procurement and/or the Auditorium located on the 1st floor of the Transportation Cabinet Office Building until 10:00 AM EASTERN DAYLIGHT TIME July 27, 2007. Bids will be publicly opened and read at 10:00 AM EASTERN DAYLIGHT TIME

ROAD AND/OR BRIDGE PLANS

REQUIRED BID PROPOSAL GUARANTY: Not less than 5% of the total bid.

(Check guaranty submitted: Cashier's Check Certified Check Bid Bond)

BID BONDS WHEN SUBMITTED WILL BE RETAINED WITH THE PROPOSAL

DBE General Plan Included

BID

PROPOSAL ISSUED TO: _____

SPECIMEN

Address

City

State

Zip

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PART I
SCOPE OF WORK

CONTRACT ID - 071036

ADMINISTRATIVE DISTRICT - 04

PROJECT(S) IDENTIFICATION AND DESCRIPTION:

COUNTY - GRAYSON

PCN - DE043006207R2

FD04 043 0062 021-023

LEITCHFIELD-ELIZABETHTOWN ROAD (US 62) WIDENING OF US 62 IN LEITCHFIELD FROM KY 259 TO THE OLD WAL-MART CENTER, A DISTANCE OF 1.37 MILES. GRADE & DRAIN WITH ASPHALT SURFACE. SYP NO. 04-00193.00.

GEOGRAPHIC COORDINATES LATITUDE 37^29'00" LONGITUDE 86^17'00"

COMPLETION DATE(S) AND LIQUIDATED DAMAGES ESTABLISHED:

250 WORKING DAYS

APPLIES TO ENTIRE CONTRACT

SEE STANDARD SPECIFICATIONS FOR LIQUIDATED DAMAGES

CONTRACT NOTES

PROPOSAL ADDENDA

All addenda to this proposal must be incorporated into the proposal when the bid is submitted to the Kentucky Department of Highways. Failure to use the correct and most recent bid sheet(s) may result in the bid being rejected.

BID SUBMITTAL

Bidder must use the Department's Highway Bid Program available on the Internet web site of the Department of Highways, Division of Construction Procurement. (www.transportation.ky.gov/contract)

The Bidder must download the bid items created from the web site to prepare a bid proposal for submission to the Department. The bidder must insert the completed bid item sheets printed from the Program into the bidder's proposal and submit with the disk created by said program.

JOINT VENTURE BIDDING

Joint Venture bidding is permissible. However, both companies MUST purchase a bidding proposal. Either proposal may be submitted but must contain the company names and signatures of both parties where required. A joint bid bond of 5% may be submitted for both companies or each company may submit a separate bond of 5%.

UNDERGROUND FACILITY DAMAGE PROTECTION

The contractor is advised that the Underground Facility Damage Protection Act of 1994, became law January 1, 1995. It is the contractor's responsibility to determine the impact of the act regarding this project, and take all steps necessary to be in compliance with the provision of the act.

ASPHALT MIXTURE

The rate of application for all asphalt mixtures shall be estimated at 110 lbs/sy per inch of depth, unless otherwise noted.

DGA BASE

The rate of application for DGA Base shall be estimated at 115 lbs/sy per inch of depth.

DGA BASE FOR SHOULDERS

The rate of application shall be estimated at 115 lbs/sy per inch of depth. Payment for necessary grading and/or shaping of existing shoulders prior to placing of Dense Graded Aggregate Base shall be included in the unit price bid per ton for Dense Graded Aggregate Base.

INCIDENTAL SURFACING

The quantities established in the proposal include estimated quantities required for resurfacing or surfacing mailbox turnouts, farm field entrances, residential and commercial entrances, and road and street approaches. These items are to be paved to the limits as shown on Standard Drawing RPM 110 or to the limits as directed by the Engineer. In the event signal detectors are present in the intersecting streets or roads, the paving of the crossroads shall be to the right of way limit or back of the signal detector, whichever is the farthest back of the mainline. These areas are to be surfaced or resurfaced as directed by the Engineer and no direct payment will be allowed for placing and compacting.

ASPHALT PAVEMENT RIDE QUALITY

Pavement Rideability Requirements shall apply on this project in accordance with Section 410 of the *2004 Standard Specifications*.

FUEL AND ASPHALT PAY ADJUSTMENT

These contract items Lot Pay Adjustment, Asphalt Adjustment and Fuel Adjustment, are for possible future payments. Additional monies may need to be setup with an additional change order if existing contract amount is insufficient to pay all items on the contract. Unit price is \$1.00. Quantity will be actual adjustment after work is completed.

OPTION A

The Contractor is advised that the compaction of asphalt mixtures furnished for driving lanes and ramps, at 25mm (1 inch) or greater, on this project will be accepted according to OPTION A in accordance with Section 402 and Section 403 of the *2004 Standard Specification*. Joint cores as described in subsection 402.03.02 are required for surface

mixtures only. The compaction of all other asphalt mixtures will be accepted by
OPTION B.

SPECIAL NOTE FOR PROJECT IDENTIFICATION SIGNS

When directed by the Engineer, install Project Identification Signs furnished by the Department at each end of the project. The signs furnished by the Department will be approximately 44" X 72" or 72" X 120" aluminum sign blanks with standard color reflective sheeting with the applicable county and project names affixed. The Engineer will determine the size and location of the signs, if any, to be used on the project(s) at the time of construction.

Pick up the signs to be furnished by the Department at the District Traffic Operations Facility. Furnish posts and hardware for mounting the signs. Install the signs at locations determined by the Engineer. Maintain the signs during the duration of the project. Upon completion of the work, remove the signs and return them to District Traffic Operations Facility. Retain possession of the posts and hardware.

The Department will measure installation of the Project Identification Signs in individual units, Each. Payment at the contract unit price Each shall be full compensation for all labor, materials, equipment, and incidentals required for picking up, installing, maintaining, and returning the project identification signs furnished by the Department.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
20588NC	Install Project Identification Signs	Each

SPECIAL PROVISION FOR WASTE AND BORROW SITES

The contractor is advised that it is their responsibility to gain U.S. Army Corp of Engineer's approval before utilizing a waste or borrow site that involves "Waters of the United States". "Waters of the United States" are defined as perennial or intermittent streams, ponds or wetlands. Ephemeral streams are also considered jurisdictional waters, and are typically dry except during rainfall, but have a defined drainage channel. Questions concerning any potential impacts to "Waters..." should be brought to the attention of the appropriate District Office for the Corps of Engineers for a determination, prior to disturbance. Any fees associated with obtaining approval from the U.S. Army Corp of Engineer or other appropriate regulatory agencies for waste and borrow sites is the responsibility of the contractor.

Right-of-Way Certification Form

Federal Funded

State Funded

This form must be completed and submitted to FHWA with the PS&E package for federal-aid funded Interstate, Appalachia, and Mega projects. This form shall also be submitted to FHWA for all federal-aid projects that fall under conditions No. 2 & 3 outlined elsewhere in this form. For all other federal-aid projects, this form shall be completed and retained in the KYTC project file.

Date: 06-February-2007

Project #: FD04 C043 64855 01R

County: GRAYSON

Item #: 04-0193.00

Federal #: N/A

Letting Date: 23-March-2007

Projects that require NO new or additional right-of-way acquisitions and/or relocations

The proposed transportation improvement will be built within the existing rights-of-way and there are no properties to be acquired, individuals and families ("relocatees") to be relocated, or improvements to be removed as a part of this project.

Projects that require new or additional right-of-way acquisitions and/or relocations

Per 23 CFR 635.309, the KYTC hereby certify that all relocatees have been relocated to decent, safe, and sanitary housing or that KYTC has made available to relocatees adequate replacement housing in accordance with the provisions of the current FHWA directive(s) covering the administration of the Highway Relocation Assistance Program and that at least one of the following three conditions has been met. (**Check those that apply.**)

1. All necessary rights-of-way, including control of access rights when applicable, have been acquired including legal and physical possession. Trial or appeal of cases may be pending in court but legal possession has been obtained. There may be some improvements remaining on the right-of-way, but all occupants have vacated the lands and improvements, and KYTC has physical possession and the rights to remove, salvage, or demolish these improvements and enter on all land. **Fair market value has been paid or deposited with the court.**

2. Although all necessary rights-of-way have not been fully acquired, the right to occupy and to use all rights-of-way required for the proper execution of the project has been acquired. Trial or appeal of some parcels may be pending in court and on other parcels full legal possession has not been obtained, but right of entry has been obtained, the occupants of all lands and improvements have vacated, and KYTC has physical possession and right to remove, salvage, or demolish these improvements. **Fair market value has been paid or deposited with the court for most parcels. Fair market value for all pending parcels will be paid or deposited with the court prior to start of construction. (See note.)**

Note: The KYTC shall re-submit a right-of-way certification form for this project prior to the start of construction, verifying that fair market value for all parcels has been paid or deposited with the court.

Right-of-Way Certification Form

3. The acquisition or right of occupancy and use of a **few** remaining parcels are not complete and/or some parcels still have occupants. However, all remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. The KYTC is hereby requesting authorization to advertise this project for bids and to proceed with physical construction even though the necessary rights-of-way will not be fully acquired, and/or some occupants will not be relocated, and/or the fair market value will not be paid or deposited with the court for some parcels at the start of construction. KYTC will fully meet all the requirements outlined in 23 CFR 309(c) (3) and 49 CFR 102(j) and will expedite completion of all acquisitions, relocations, and full payments after construction starts. A full explanation and reason for this request, including identification of each such parcel and dates on which acquisitions, payments, and relocations will be completed, is attached to this certification form for FHWA consideration of approval. **(See note.)**

Note: The KYTC may request authorization on this basis only in unique and unusual circumstances. Proceeding to construction of projects on this basis shall be the exception and never become the rule. In all FHWA-approved cases, the KYTC shall make extraordinary efforts to expedite completion of the acquisition, payment for all affected parcels, and the relocation of all relocatees promptly after start of construction.

Approved: Dean M. Loy, *Dean M. Loy* ROW Agent Supervisor
Printed Name Signature

Approved: _____ Director of ROW & Utilities
Printed Name Signature

Right-of-Way Certification Form

Date: 06-February-2007

Project #: FD04 C043 64855 01R

County: GRAYSON

Item #: 04-0193.00

Federal #: N/A

Letting Date: 23-March-2007

This project has 76 total number of parcels to be acquired, and 2 total number of individual or families to be relocated, as well as 1 total number of businesses to be relocated.

- 63 Parcels where acquired by a signed fee simple deed and fair market value has been paid
- 13 Parcels have been acquired by IOJ through condemnation and fair market value has been deposited with the court
- 0 Parcels have not been acquired at this time (*explain below for each parcel*)
- 0 Parcels have been acquired or have a "right of entry" but fair market value has not been paid or has not been deposited with the court (*explain below for each parcel*)
- 0 Relocatees have not been relocated from parcels: _____ and _____
(*explain below for each parcel*)

Parcel #	Name/Station	Explanation for delayed acquisition, delayed relocation, or delayed payment of fair market value	Proposed date of payment or of relocation

There are 0 billboards and/or 0 cemeteries involved on this project.
 There are 0 water or monitoring wells on parcels 0 and _____. All
 have been acquired and are the responsibility of the project contractor to close/cap.

**UTILITY NOTES TO BE INCLUDED IN THE PROPOSAL
SPECIAL NOTES FOR UTILITY CLEARANCE
IMPACT ON CONSTRUCTION**

**GRAYSON COUNTY
FD04 043 64855 01 U
LEITCHFIELD-ELIZABETHTOWN ROAD (US 62)
ITEM NO. 4 – 193.00**

SPECIAL CONTRACT AWARD AND UTILITY RELOCATION NOTE:

Upon opening of bids, the Department will make the determination to tentatively accept the apparent low bid and proceed with placing the winning bidder for this contract on the Pending Award List. The Pending Award List is intended as a means to offer the Department and the Contractor the opportunity to ascertain the ability of the respective utility companies to meet the work schedules they have provided. Attached is a listing of utilities to be relocated by the respective companies as part of this project. The dates provided by the utility companies attached indicate the final utility will be relocated August 15, 2007. Upon placement of a Contractor on the Pending Awards List for this contract, the Contractor is given the opportunity to monitor the progress of the respective utility companies as they work towards completing the required relocation work. At any time between the date the Contractor is placed on Pending Awards List and August 15, 2007, the Contractor may request that the award for the contract be given and start the process to finalize the contract and issue the work order. By requesting that the contract be awarded prior to August 15, 2007, **it is understood and agreed to by the Contractor that he shall indemnify and save harmless the Commonwealth, the Department and all its officers, agents and employees from all suits, actions or claims of any character brought on by delays, inefficiencies, inconveniences or damage associated with scheduling and completing any/or all utility relocations that are or become associated with the project. Further, by requesting that the contract be awarded, the Department will not allow and the Contractor agrees that no additional compensation for delays, inconvenience, inefficiencies or any other damages sustained by the Contractor and his Subcontractors due to any interference from the utility appurtenances or due to the operation of moving them.**

If no request is made by the Contractor to award the contract by August 15, 2007 a meeting will be scheduled with Contractor and the Department no later than August 27, 2007. At this meeting, the Contractor and the Department will each be allowed the opportunity to cancel the contract at no cost to either party. If both parties agree, the Pending Award List process can be extended for 30 days, at which time the Contractor and the Department will again be given the opportunity to cancel the contract at no cost to either party. This process can be repeated as long as both parties are willing to accept all original contract bid prices, with appropriate fuel and asphalt adjustments in place at the letting.

Upon issuance of the work order, the Department will not begin charging work days until 14 calendar days after the Department determines that all utility relocations have been completed to the point that the Contractor's work can begin. Written notification will be provided by the Department to the Contractor advising when the Project Engineer will begin charging working days.

The following utility companies have facilities to be relocated and/or adjusted on the subject project:

Windstream Communications – The telephone company has overhead and underground fiber and copper cables to be relocated on this project. The overhead cables will be placed on KU or Windstream poles. Some of the underground facilities will remain, some will be lowered and there will be some new installation. This relocation is expected to be complete by August 15, 2007. (Roger Redford 5-31-2007). Contact: Mr. Roger Redford, Senior Engineer Major Projects, Phone 502-957-7140.

Kentucky Utilities – The electric company is complete with the relocation and/or adjustment of their facilities on the project. (Ervin Boring 4-5-07). Contact Ervin Boring, Engineer, 270-765-8616 Ext. 24.

Comcast Communications – The CATV company has overhead facilities to be relocated. Their overhead facilities will be relocated to the new KU & Windstream poles. This relocation is expected to be complete by June 15, 2007. (Danny Hoover 5-31-2007). Contact Danny Hoover, Construction Supervisor, 270-737-4200 Ext. 0351.

Leitchfield Utility Commission- The Commission has water, sewer and gas plans included in the roadway plans to relocate their facilities. Contact: Charles E. Miller, Superintendent, 270-259-4034.

There are no railroads involved on this project.

PROTECTION OF UTILITIES

The location of utilities provided in the contract documents has been furnished by the facility owners and/or by reviewing record drawings and may not be accurate. It will be the roadway contractor's responsibility to locate utilities before excavating by calling the various utility owners and by examining any supplemental information supplied by the cabinet. If necessary, the roadway contractor shall determine the exact location and elevation of utilities by hand digging to expose utilities before excavating in the area of a utility. The cost for repair and any other associated costs for any damage to utilities caused by the roadway contractor's operations shall be borne by the roadway contractor.

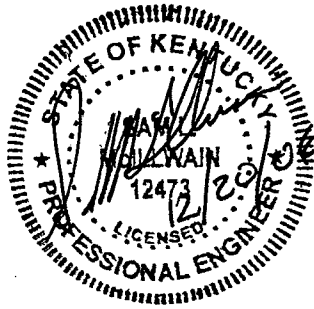
The Contractor is advised to contact the BUD one-call system at 1-800-752-6007; however, the Contractor should be aware that owners of underground facilities are not required to be members

of the BUD one-call system. It may be necessary for the Contractor to contact the County Court Clerk to determine what utility companies have facilities in the project area.

COORDINATION WITH UTILITY FACILITY OWNERS

The Contractor will be responsible for contacting all utility facility owners on the subject project to have existing facilities located in the field. The Contractor will coordinate his/her activities with the utility facility owners to minimize and, where possible, avoid conflicts with utility facilities.

**VOLUME I OF
CONTRACT DOCUMENTS
FOR THE
LEITCHFIELD UTILITIES COMMISSION
LEITCHFIELD, KENTUCKY
HIGHWAY 62 UTILITIES RELOCATION**



NOTE:

THE ENGINEER'S STAMP BY WATER MANAGEMENT SERVICES, LLC, ON THESE SPECIFICATIONS COVERS ONLY WATER, GAS, AND/OR SEWER UTILITY RELOCATION DESIGN. THE BASE BACKGROUND ON ALL CONTRACT DRAWINGS AND ALL OTHER LIGHTER BACKGROUND PORTIONS OF THESE DRAWINGS WERE PROVIDED BY THE KENTUCKY TRANSPORTATION CABINET.

**WATER MANAGEMENT SERVICES, LLC
111 BUSH ROAD
P. O. BOX 17650
NASHVILLE, TENNESSEE 37217
(615) 366-6088
Fax (615) 366-6203**

WMS No. 00138

LEITCHFIELD UTILITIES COMMISSION
LEITCHFIELD, KENTUCKY

HIGHWAY 62 UTILITIES RELOCATION

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AGREEMENT SECTION

LEITCHFIELD UTILITIES COMMISSION
LEITCHFIELD, KENTUCKY

HIGHWAY 62 UTILITIES RELOCATION

SPECIAL CONDITIONS OF CONTRACT

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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 sewer, water and/or gas 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 - Department for Environmental Protection, Water Resources Branch. 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 Signs

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 1 1/4-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:

LEITCHFIELD UTILITIES COMMISSION
LEITCHFIELD, KENTUCKY

HIGHWAY 62 UTILITIES RELOCATION

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 Leitchfield Utilities Commission.

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 Leitchfield Utilities Commission 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 Grayson County, Kentucky Ordinances and or 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 water, sewer, and/or gas 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

(OMITTED)

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 Kentucky Department of Highways, as the case may be.

15. Pavement Restoration

Where sewer, water and/or gas 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 sewer, water and/or gas installation, to regrade the street with pug mix to the template that existed prior to construction. This regrading shall be satisfactory to Leitchfield Utilities 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 sewer, water and gas lines for which there is no specific pay item (s), shall be

considered as incidental to the construction of the proposed utility 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 sewer, water and/or gas line was not constructed under the pavements or where existing pavements were disturbed in the correction of 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 Leitchfield Utilities Commission. 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.

Additional Temporary Construction Easement for Sufficient Working Room Not-to-Exceed 10 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. Wastewater Bypassing

The Contractor shall insure that no wastewater bypassing will occur due to construction activities unless a schedule is approved by the Commonwealth of Kentucky, Department of Natural Resources and the U.S. Environmental Protection Agency.

19. 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 Leitchfield Utilities Commission 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.

20. 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 sewer, water and/or gas mains.

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. Field Office for Engineer

Note: Field Office for Engineer is not required on this Project.

23. Prevailing Wage Rate

(OMITTED)

24. 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:

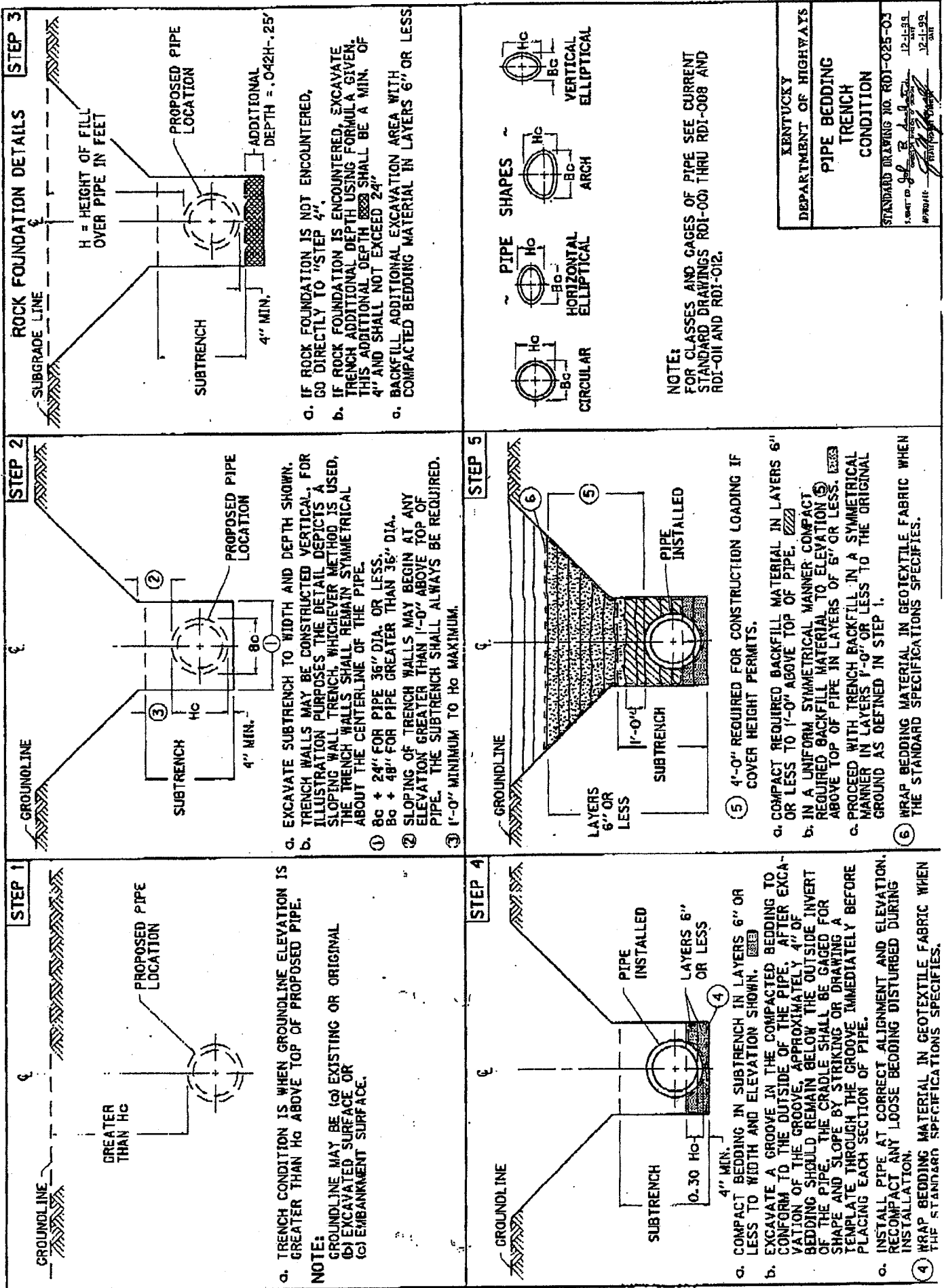
- A. Notify the local Utilities Board of the damage and coordinate with the Board on the operation of any valves.
- B. Complete the repair in compliance with requirements of the local Utilities Board.
- C. Furnish and install materials, fittings and sleeves in compliance with the standards of the local 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 Utilities Board shall be billed to the Contractor based on the Board's Standard invoicing procedures.

25. Drug Testing

As required by Part 199 of the Pipe Safety Regulations of the U.S. Department of Transportation, the Leitchfield Utilities Commission maintains and follows a written anti-drug plan. For this project, the Contractor and his employees shall fully comply with the City's plan and Part 199n referenced above. Both of these documents are incorporated and made part of the requirements for this project. As provided in Section 199.21 of the Pipe Safety Regulations, enclosed herewith, the Contractor shall provide the City with a copy of his drug plan and pertinent records thereof for review and approval by the City. Any deficiencies found in the Contractor's document shall be corrected before any work is authorized to begin on the project. Failure of the Contractor to comply with this drug testing plan at any time during the term of this project can be considered a default by the Contractor and subject to termination of the Agreement as provided in Article 3.4 of the General Conditions of this document.

**TRANSPORTATION CABINET'S
UNDER ROADWAY BACKFILL REQUIREMENTS**



701.03.06 Initial Backfill. Locate a suitable backfill source for each project. For backfill containing soils, have an AASHTO accredited lab classify the material, run a standard proctor, and certify that the material conforms to the specified granular material. Keep the material certification on file and available to the Engineer upon request.

Place the backfill material in a trench condition as the Contract specifies. Use 6-inch lifts and ensure the backfill is compacted to not less than 95 percent of the maximum density as determined according to KM 64-511.

When the top of the pipe is within one pipe diameter of the subgrade, backfill with flowable fill to an elevation of one foot above the pipe from the outside edge of shoulder or back of curb to outside edge of shoulder or back of curb as applicable. When installing under existing pavement, backfill with flowable fill to the subgrade elevation.

When granular backfill is used, the surrounding conditions are not similar in gradation, and the pipe is located within the area bounded by the centerline and a distance 25 feet outside the edge of shoulder or back of curb, as applicable, wrap the bedding and granular backfill in geotextile fabric. The Department will not require geotextile fabric for entrance pipe. When geotextile fabric is required according to this section or the Engineer's direction, install according to Section 214.

When the Contract specifies, perform quality control testing to verify compaction according to KM 64-412. The Department may verify the density results at any time of the duration of the project.

SECTION 214 — GEOTEXTILE CONSTRUCTION

214.01 DESCRIPTION. Install geotextile fabric, when required in the Contract, for slope protection and channel lining, underdrains and drainage blankets, and subgrade or embankment foundation stabilization.

214.02 MATERIALS.

214.02.01 Geotextile Fabric. Conform to Section 843.

214.02.02 Steel Pins. Conform to Section 843.

214.03 CONSTRUCTION. The Engineer will reject the fabric if it has defects, rips, holes, flaws, deterioration, or damage.

Prepare the surface to receive the fabric to a smooth condition, free of obstructions, debris, or sharp objects that may puncture the fabric. Place the fabric smooth and free of tension, stress, folds, wrinkles, or creases. Do not operate equipment directly on the fabric. Protect the fabric at all times from contamination. Remove and replace any contaminated fabric with uncontaminated fabric.

Repair or replace any fabric damaged. Repair individual isolated cuts, tears, or punctures by placing a patch of geotextile fabric that extends at least 3 feet beyond the damage in all directions or by field splicing the patch.

Cover the fabric with a layer of the specified material within 14 calendar days. Remove and replace fabric not covered within the 14 days.

214.03.01 Laps. When more than one strip is necessary, place an overlap of at least 18 inches. Place transverse laps so the upstream strip laps over the downstream strip. Place horizontal laps so the upper strip laps over the lower strip.

Install fastener pins through both strips of overlapped fabric at no less than 5-foot intervals along a line through the midpoint of the overlap, and at any other locations as necessary to prevent any slippage of the fabric.

The Department will allow field splices in place of laps.

214.03.02 Field Splices. Sew the full length of the boundary between adjacent sheets of fabric. Ensure that the seam strength conforms to the requirements of Section 843.

214.03.03 Slope Protection and Channel Lining. Place Type I fabric with the long dimension parallel to the channel or toe of slope.

Protect the fabric from damage due to the placement of the slope protection or channel lining either by limiting the height of drop of the material to no greater than 3 feet or by placing a cushioning layer of sand on top of the fabric before dumping the material. Demonstrate to the Engineer that the placement technique prevents damage to the fabric. Begin placement of material at the toe and proceed up the slope.

214.03.04 Underdrains. Place and shape Type II fabric to the sides and bottom of the trench without stretching the fabric. Place filter aggregate so as not to damage, displace, or dislodge the fabric according to Subsection 704.03. Fold the fabric over the backfilled trench and secured it with steel pins at intervals of 5 feet to produce a double thickness of fabric over the top of the trench.

214.03.05 Subgrade or Embankment Foundation Stabilization. Place Type III fabric with the long dimension parallel to the long dimension of the area to be covered. Leave surface vegetation in place.

During back dumping and spreading, do not allow the wheels of trucks, dozer blades, and other equipment to come into direct contact with the fabric. Spread the material in the direction of the fabric overlap. If large fabric wrinkles develop during spreading

TYPE II FABRIC GEOTEXTILES FOR UNDERDRAINS (except pavement edge drains)		
Property	Minimum Value ⁽¹⁾	Test Method
Grab Strength (lbs)	80	ASTM D 4632
Elongation (%)	N/A	ASTM D 4632
Sewn Seam Strength ⁽²⁾ (lbs)	70	ASTM D 4632
Puncture Strength (lbs)	25	ASTM D 4833
Burst Strength (psi)	130	ASTM D 3786
Trapezoid Tear (lbs)	25	ASTM D 4533
Apparent Opening Size U.S. Std. Sieve	Sieve U.S. #50	ASTM D 4751
Permeability (cm/s)	0.010	ASTM D 4491
Ultraviolet Degradation at 150 hours	70% strength retained for all classes	ASTM D 4355
Flow Rate (gal./min./ft ²)	50	ASTM D 4491

TYPE III FABRIC GEOTEXTILES FOR SUBGRADE OR EMBANKMENT STABILIZATION		
Property	Minimum Value ⁽¹⁾	Test Method
Grab Strength (lbs)	180	ASTM D 4632
Elongation (%)	N/A	ASTM D 4632
Sewn Seam Strength ⁽²⁾ (lbs)	160	ASTM D 4632
Puncture Strength (lbs)	67	ASTM D 4632
Burst Strength (psi)	290	ASTM D 3786
Trapezoid Tear (lbs)	67	ASTM D 4533
Apparent Opening Size U.S. Std. Sieve	U.S. #40	ASTM D 4751
Permeability (cm/s)	0.002	ASTM D 4491
Ultraviolet Degradation at 150 hours	70% strength retained for all classes	ASTM D 4355
Flow Rate (gal./min./ft ²)	7	ASTM D 4491

SECTION 843 — GEOTEXTILE FABRICS

843.01 DESCRIPTION. This section covers requirements for geotextile fabrics for slope protection and channel lining, underdrains, subgrade or embankment foundation stabilization, and drainage blankets.

843.01.01 Geotextile Fabric. Use either woven or non-woven fabric consisting only of long chain polymeric filaments or yarns such as polypropylene, polyethylene, polyester, polyamide, or polyvinylidene-chloride formed into a stable network such that the filaments or yarns retain their relative position to each other. Use fabric that is inert to commonly encountered chemicals and free of defects or flaws significantly affecting its physical or filtering properties.

Ensure that the fabric, except wrapping placed directly against perforated pipe, is formed in widths of at least 6 feet. When necessary, sew sheets of fabric together to form required fabric widths. Sew the sheets of fabric together at the point of manufacture or other approved locations.

The geotextile manufacturer is responsible for establishing and maintaining a quality control program to ensure compliance with this section.

- A) **Packaging.** During all periods of shipment and storage, wrap the fabric in a heavy duty protective covering to protect the fabric from direct sunlight, ultraviolet rays, temperatures greater than 140 °F, mud, dirt, dust, and debris.
- B) **Physical Requirements:** Conform to the following applicable table as specified for each use.
- C) **Acceptance.** Obtain the Department's approval for all material before incorporating it into the project.

TYPE I FABRIC GEOTEXTILES FOR SLOPE PROTECTION AND CHANNEL LINING		
Property	Minimum Value ^{a)}	Test Method
Grab Strength (lbs)	200	ASTM D 4632
Elongation (%)	15	ASTM D 4632
Sewn Seam Strength ^{b)} (lbs)	180	ASTM D 4632
Puncture Strength (lbs)	80	ASTM D 4833
Burst Strength (psi)	320	ASTM D 3786
Trapezoid Tear (lbs)	50	ASTM D 4533
Apparent Opening Size U.S. Std. Sieve	Sieve U.S. #40	ASTM D 4751
Permeability (cm/s)	0.004	ASTM D 4491
Ultraviolet Degradation at 500 hours	70% strength retained for all classes	ASTM D 4355
Flow Rate (gal./min./ft ²)	20	ASTM D 4491

TYPE IV FABRIC GEOTEXTILES FOR EMBANKMENT DRAINAGE BLANKETS AND PAVEMENT EDGE DRAINS		
Property	Minimum Value ^(a)	Test Method
Grab Strength (lbs)	180	ASTM D 4632
Elongation (%)	N/A	ASTM D 4632
Sewn Seam Strength ^(a) (lbs)	160	ASTM D 4632
Puncture Strength (lbs)	80	ASTM D 4833
Burst Strength (psi)	290	ASTM D 3786
Trapezoid Tear (lbs)	50	ASTM D 4533
Apparent Opening Size U.S. Std. Sieve	U.S. #50	ASTM D 4751
Permeability (cm/s)	0.008	ASTM D 4491
Ultraviolet Degradation at 150 hours	70% strength retained for all classes	ASTM D 4355
Flow Rate (gal./min./ft ²)	40	ASTM D 4491

^(a) Minimum. Use value in weaker principal direction. All numerical values represent minimum average roll value (i.e., test results from any sampled roll in a lot shall meet or exceed the minimum values in the table).

^(b) Values apply to both field and manufactured seams.

843.01.02 Acceptance Procedures for Non-Specification Fabric. Ensure that all geotextile fabric conforms to the requirements of this section. However, when non-specification geotextile fabric is inadvertently incorporated into the work before completion of testing, the Department may accept the material with a reduction in pay, provided the failure is marginal and will not cause poor performance. When the failure is excessive, then remove the geotextile fabric, and replace it unless the Engineer determines that the geotextile fabric can remain in place. The Department will apply the largest payment reduction when the material fails to meet more than one specification requirement. The Department will calculate the payment reduction on the invoice cost of the material delivered at the project site. The Department will reject geotextile fabric that fails and has not been incorporated into the work.

AOS PAYMENT REDUCTION					
#35 - #40 or #45 - #50 Glass Beads Passing Fabric as Applicable	0-5	6-10	11-15	16-20	21 or more
Reduction Rate	0%	≥ 20%	30%	40%	*

GRAB STRENGTH PAYMENT REDUCTION				
% of Requirement	100% or more	90-99%	75-89%	74% or Less
Reduction Rate	0%	25%	40%	*

ELONGATION PAYMENT REDUCTION (TYPE I FABRIC ONLY)				
% of Requirement	100% or more	90-99%	75-89%	74% or Less
Reduction Rate	0%	25%	40%	*

SEWN SEAM STRENGTH PAYMENT REDUCTION				
% of Requirement	100% or more	90-99%	75-89%	74% or Less
Reduction Rate	0%	25%	40%	*

FLOW RATE PAYMENT REDUCTION				
% of Requirement	100% or more	90-99%	75-89%	74% or Less
Reduction Rate	0%	25%	40%	*

**Remove and replace the fabric unless the Engineer determines the fabric can remain in place at a 100% reduction rate.*

843.01.03 Fastener Pins. The Engineer will accept fastener pins based on visual inspection on the project. Conform to the following:

- A) Underdrain Systems.** Use pins that are formed of No. 9 diameter or heavier steel wire and are at least one foot long with a 4-inch right angle bend on one end.
- B) Slope Protection, Channel Lining, Subgrade and Embankment Foundation Stabilization, and Wrapped Aggregate Drainage Blankets.** Provide fastener pins that are formed of 3/16 inch diameter or heavier steel, pointed at one end, with a head on the opposite end to retain a washer with a minimum diameter of 1 1/2 inches.

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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" -- Leitchfield Utilities Commission, Leitchfield, 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

See Special Conditions for office requirements.

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. Any inspector shall have the right to order the work to which he is assigned stopped if, in his judgment, such action is necessary to allow proper inspection, avoid irreparable damage to the work, or avoid subsequent rejection of work which could not be readily replaced or restored to an acceptable condition. Such stoppage shall be for a period reasonably necessary for notification of the Engineer and for the Engineer to determine that the work will, in fact, proceed in due fulfillment of all Contract requirements.

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.

All Subcontractors shall secure and provide certificate of insurance coverage for Workmen's Compensation insurance as provided in Paragraph 5.1.2 of this Section.

5.1.1.5 Included Coverage

The above public liability and property damage insurance shall also include the following coverages:

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 Longshoremen 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.

All Subcontractors shall secure and provide certificate of insurance coverage for Workmen's Compensation insurance regardless of the number of employees.

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 Ten percent until construction is substantially complete.
- 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 a percent, as controlled by local conditions, but not to exceed 30 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:

	<u>Straight Time for each hour</u>	<u>Overtime for each hour</u>
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.

DRUG POLICY AGREEMENT
(To Be Submitted with Contract Agreement)

Contractor and City/Operator hereby agree that City/Operator in no way authorizes Contractor or Contractor's subcontractor(s) to violate the provisions of the Drug Policy Regulations or to violate the civil rights of the employees of the Contractor or Contractor's subcontractor(s), notwithstanding that City/Operator has not enumerated all requirements of the Drug Policy Regulations or all drug testing activities which may violate an employee's civil rights. Contractor agrees to assume complete responsibility for examining the Drug Policy Regulations and for keeping abreast of any amendments thereto or interpretations thereof by DOT and any invalidations or modifications thereof by any state or federal court.

THIS AGREEMENT IS HEREBY ACCEPTED BY OWNER AND CONTRACTOR THIS _____
DAY OF _____, 200__

OWNER

CONTRACTOR

BY: _____
(Signature)

BY: _____
(Signature)

TITLE: _____

TITLE: _____

ATTESTED: _____

ATTESTED: _____

DRUG TESTING AFFIDAVIT

I, _____, being duly sworn, do depose and say:
(name)

- (1) I am over the age of eighteen and understand the obligation of an oath.
- (2) I am _____ of _____ and, in such capacity, I
(Position) (Company)
have personal knowledge of the facts and statements set forth in this affidavit and each fact and statement set forth herein is true to the best of my knowledge and belief;
- (3) That _____ has in place a drug training and testing program
(Company)
for its employees that meets the requirements of the U.S. Department of Transportation's Pipeline Safety Regulation Part 199;
- (4) That the drug testing laboratory retained by _____
(Company)
is _____ which is certified by the U.S. Department of
(Laboratory Name)
Health and Human Services;
- (5) That _____ has retained _____
(Company) (Physician)
of _____ as Medical Review Officer (MRO) for its drug
(MRO - FIRM)
testing program;
- (6) That all employees covered by D.O.T. Part 199 receive random, for cause, and post accident testing pursuant to such regulation;
- (7) That upon 48 hours' notice _____ shall deliver to
(Company)
Leitchfield Utilities Commission Gas System all drug training and testing records as requested for the purpose of monitoring the drug training and testing program for compliance with D.O.T. Regulation Part 199.

The Affiant

Signature

Date

CONTRACT SPECIFICATIONS

DIVISION A - GENERAL REQUIREMENTS

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DIVISION A
GENERAL REQUIREMENTS

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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 sewer, water and gas 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 "Approved," "Approved as Noted," or "Disapproved," 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 G - SEWERS, FORCE MAINS AND APPURTENANCES

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DIVISION G
SEWERS, FORCE MAINS AND APPURTENANCES

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SEWERS, FORCE MAINS AND APPURTENANCES

SECTION 1

GENERAL REQUIREMENTS

1. GENERAL

1.1 Scope of Work

The sewers, force 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 sewer 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.

1.3 Infiltration Tests

Certain times of the year acceptance of concrete sanitary sewers is not possible because there is not sufficient groundwater in order to make a proper infiltration test. Therefore, should the acceptance of lines be required during dry periods of the year, an exfiltration test is a part of the Contract and shall be used when ordered by the Owner or Engineer to ascertain whether a line is acceptable during dry periods. The maximum allowable infiltration and/or exfiltration shall not exceed 25 gallons per mile per inch diameter of sewer per 24-hour day at any time. This test shall not be required on lines that are low-pressure air tested as set forth below.

All sanitary sewer lines shall be air tested as a part of this Contract as specified in ASTM C-828-76T, as detailed in Section 4, Paragraph 1.2 of these Specifications.

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 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, or structures as shown on the Contract Drawings shall be merged into the unit price per linear foot of gravity sewer. The Contractor shall be reimbursed for the bracing or supporting of utilities due to realignments of the gravity sewer to meet field conditions. Any realignment which eliminates any bracing or supporting necessary according to the Contract Drawings shall be credited to the Owner by the Contractor.

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 Sewer Facilities. In some instances, existing sewers, force mains, or drains may be encountered along the line of work. In all such cases, the Contractor shall perform his operations in such manner that sewer service will not be interrupted and shall, at his own expense, make all temporary provisions to maintain sewer and drain service. Unless otherwise indicated on the plans, the Contractor shall replace any disturbed sewer or drain or re-lay same at his own expense to a new grade to be approved by the Engineer, such that sufficient clearance for the sewer will be provided. The Contractor will reuse existing castings if not damaged or furnish new castings of the type required by the Engineer.

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 sewers or drains encountered or for re-laying same at a new grade or line.

Existing Pumping Station Operation. The existing pumping station will be in continuous operation during the construction period until such time as the tie-over is made.

The Contractor shall plan and conduct construction operations to avoid disturbing existing structures, piping, equipment, and services in any manner which will interrupt or impair operations except as approved by the Engineer.

The Contractor shall submit for approval a construction sequence intended to be used in maintaining the uninterrupted operation of the existing pumping station.

Existing Water Facilities. Where existing water mains are encountered in the work, they shall be maintained in operation.

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

The Contractor will give adequate notice to the gas department 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 at the discretion of the Engineer.

Before backfilling any trench in which a gas main has been exposed, the Contractor shall notify the gas department 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 department 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 manhole and/or 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 downstream 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 manhole or 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 insure the protection of persons, property, and the work. Traffic control devices shall meet the requirements of the "Manual of Uniformed Traffic Control Devices" (MUTCD).

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 the Leitchfield Utilities Commission, Kentucky Department of Highways, Grayson County Road Commission, or as the case may be.

Where sewers and/or force 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 sewer installation, to regrade the street with pug mix to the template that existed prior to construction. This regrading shall be satisfactory to the Leitchfield Utilities 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 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 sewer, 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 sewer and/or force 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 sewer and/or force 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 Specifications. The 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 sewer 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 sewers 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 sewer line will be limited to visual testing, infiltration testing, and air testing unless directed otherwise by the Engineer.

6. 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, the 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.

SEWERS, FORCE 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 4,500 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 not 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 67.

Crushed stone for backfill shall meet the quality requirements of ASTM D-692 and the grading requirements of AASHTO M-43 for size 67.

4. MANHOLE FRAMES & COVERS

Manhole castings shall conform to ASTM Designation A-48, latest revision, Class 30, and shall be free from scale, lumps, blisters, sandholes, and defects of every nature which would impair their use. Castings shall be well cleaned, with a smooth tough asphaltic coating. Covers shall be of the solid-indented type with the words "SANITARY SEWER" cast in raised letters thereon. Bearing surfaces of frames and covers shall be machined to provide a solid bearing and prevent rocking. Pattern drawings and weights of castings shall be submitted for the approval of the Engineer.

Vented lids shall be furnished and installed at ends of lines and at approximately 1,400 feet along line segments. Locations of all vented lids shall be at locations determined by the Engineer.

Manhole frames and covers (minimum clear openings to be 24 inches) shall be equal to those listed below for particular applications.

NON-TRAFFIC (Standard)	John Bouchard No. 1155
TRAFFIC	Same as Non-Traffic type specified above
WATERTIGHT	To be used where manhole casting is subject to flood or submergence by surface runoff John Bouchard No. 1123
WATERTIGHT INSERT	To be used as directed by Engineer. Manhole frame and cover to be same as non-traffic type as specified above. Insert to be Sewer Guard as manufactured by Preco Industries Ltd. or equal.

5. MANHOLE STEPS

Steps shall be (1) aluminum, equal to #15295 by Alcoa, or (2) ductile iron equal to Neenah No. R1981-Q, or (3) plastic encapsulated steel equal to No. PS 1-45 as manufactured by M.A. Industries, Inc., East Point, Georgia.

6. MONOLITHIC POURED-IN-PLACE MANHOLES

Concrete shall be Class A design mix and shall be submitted to the Engineer for approval. Also for each day's pour, two test cylinders should be made and tested in compliance with ASTM 172, ASTM C-31 and ASTM C-39. These testings shall be done by a testing laboratory selected, employed, and paid for by the Contractor.

The Contractor shall submit to the Engineer and the Owner his choice of a testing laboratory for their approval. The Contractor shall instruct the testing laboratory to forward copies of the test reports to the Engineer and the Owner.

All manholes constructed and installed on this project shall be cast with XYPEX® Admix C-1000 in the concrete for waterproofing and corrosive protection. The manufacturer's

recommended addition rate for Concentrate C-1000 is 3% by weight of cement. XYPEX® Concentrate C-1000 shall be as supplied by Tom Williams; 1231 Antioch Pike; Nashville, Tennessee

The maximum depth of manholes shall not exceed 20 feet. The minimum wall thickness for 4'-0" inside-diameter manholes shall be 6 inches. The minimum wall thickness for 5'-0" and 6'-0" inside-diameter manholes shall be 8 inches.

The base concrete shall be Class A as stated above, vibrated on firm sub-grade foundation or suitable crushed stone bedding. The base shall have a minimum diameter 8 inches greater than the outside diameter of the manhole and a minimum thickness, including the area under the pipe, as follows:

0' to 8' Manhole	8"
8' to 12' Manhole	10"
12' to 20' Manhole	12"

All water shall be removed from the form before and during the placement of the concrete. The first placement of base concrete shall consist of approximately 1/2 cubic yard of concrete deposited evenly around the walls and vibrated until there is a minimum slope of 60 degrees from the bottom of the forms to the bearing surface both inside and outside of the manhole. When this is complete and before additional concrete is added, the concrete must be carefully vibrated on each side of each pipe.

Concrete must be deposited in evenly distributed layers of 18 inches with each layer vibrated to bond to the preceding layer. The wall spacers must be raised as the placements are made with the area from which the spacer is withdrawn being carefully vibrated.

Should a cold joint become necessary, a formed groove and reinforcing dowels (#5 bars 36 inches long at 12-inch centers) will be required in the top of the first placement for shear protection. Immediately before the second placement is made, the surface of the cold joint shall be thoroughly cleaned and wetted with a layer of mortar being deposited on the surface.

Felt adjustment rings will be formed and/or poured into the top section of the manhole to provide future manhole casting adjustments equal to two course of brick.

The forms may be removed 24 hours after placement. At this time a membrane curing compound with a fugitive dye included will be applied by power spraying to the outside of the manhole. The Contractor must submit manufacturer's descriptive details for curing compounds for approval.

The monolithic manholes shall be backfilled to same level simultaneously all around. The manholes shall not be backfilled until they reach 75% of the specified design strength. A select gravel backfill material shall be placed adjacent to the manholes in areas where swelling clays exist.

A resilient pipe connector and "Cavity-O-Ring" seal shall be utilized to connect pipe to manhole sidewall.

Eccentric manhole cones shall be furnished and installed for 5-foot and 6-foot diameter manholes on precast or poured-in-place manholes. Concentric manhole cones may be installed on 5-foot and 6-foot diameter manholes if transition sections are used from 5-foot or 6-foot diameter to 4-foot diameter at approximately 60 inches above pipes. Details of proposed manhole construction shall be submitted to Engineer for approval.

7. PRECAST MANHOLES

Precast manholes shall conform to the latest revision of ASTM C-478. Drawings of manhole sections proposed for use on this project must be submitted to the Engineer for approval prior to use. Steps shall be furnished in accordance with Paragraph 5 of this Section, and care must be taken to assure a firmly embedded step with no cracks from mortar shrinkage which will allow leakage. Aluminum in contact with concrete shall be coated with heavy bitumastic paint. Loose steps and shrinkage cracks passing through manhole walls shall be cause for rejection.

All manholes constructed and installed on this project shall be cast with XYPEX® Admix C-1000 in the concrete for waterproofing and corrosive protection. The manufacturer's recommended addition rate for Concentrate C-1000 is 3% by weight of cement. XYPEX® C-1000 shall be as supplied by Tom Williams; Williams Coating Consultants, Inc.; 1231 Antioch Pike; Nashville, Tennessee. Precast manholes with XYPEX® C-1000 Admix shall be as manufactured by Cloud Concrete Products of LaVergne, Tennessee or Engineer-approved equal.

Manhole sections showing evidence of cracking, crazing, honeycombing, crumbling, or excessive roughness will not be acceptable. Sections with improper cut-outs, misalignments or other defects shall not be utilized in the project.

Precast manhole panel (monolithic) bases may be used. Drawings of the monolithic bases proposed for use on this project must be submitted to the Engineer for approval prior to use. Bases shall have a minimum thickness of 8 inches with a minimum thickness of 2 inches allowed at the invert of the downstream pipe for the construction of the invert.

Manhole sections shall be steam or water cured and shall not be delivered to job site until at least 7 days old. Each section shall be marked in a permanent manner with date of manufacture, manufacturer's mark, and manhole location or manhole number. Manhole sections to receive pipes shall be furnished with appropriate cut-outs with resilient connectors for installation of pipe.

On precast manhole sidewall, an approved flexible plastic gasket equal to RAM-NEK shall be applied to the joint surface to placement of next manhole section. The placement of this gasket shall also be required under all manhole castings and adjustment rings for castings.

Testing and Inspection of precast manhole sections shall be done at the site of manufacture in accordance with ASTM C-478 by the manufacturer. Compression tests shall be run on specimens obtained from each day's production: a minimum of 2 cylinders or cores per day's run but no less than the maximum number designated by ASTM C-478. The absorption test shall be run on a minimum of 2 randomly selected manhole sections per each day's production. Certified test reports shall be submitted in three (3) copies to the Engineer.

In addition to testing required of the manufacturer as described above, the Owner may provide an independent testing laboratory to make visual inspections of manhole sections produced from selected sections. The random samples will be selected by the Owner's testing laboratory and will be taken from stock on the manufacturer's yard intended for use on this project. Core samples shall be cut from designated sections amounting to no more than 4% of the total production in order to run compressive strength and absorption tests. The manufacturer shall cut the cores and seal the holes, but this testing shall be done by the Owner's testing laboratory and paid for by the Owner. In the event the samples fail to conform to the Specifications, the manufacturer may furnish additional test specimens to the extent permitted by the Specifications. Testing done by the Owner's testing laboratory shall be in accordance with ASTM C-478, latest revision.

In the event of a discrepancy between results of tests run by the manufacturer and tests run by the Owner's testing laboratory, the Engineer shall determine the test results which will be applicable.

8. RESILIENT CONNECTORS

All connections of pipes to manhole sidewalls shall be made with resilient connectors. Openings in the manhole sidewall shall be so constructed as to include the resilient connector such that it is an integral part of the sidewall and to provide for the required size and location of the pipe to connect to the manhole. The sidewall opening shall be manufactured to allow for lateral and vertical movement, as well as angular adjustments through 20°. The resilient connector shall be Kor-N-Seal as manufactured by NPC, Inc. or approved equal. The resilient connector shall meet all physical and performance requirements as set forth by ASTM C-923.

The Contractor shall install a flexible annular space filler around entire pipe with "Cavity-O-Ring" as manufactured by NPC Systems, Inc. of Milford, NH or approved equal.

9. DUCTILE IRON PIPE

Ductile iron pipe for gravity lines and force mains shall conform to USA Standard A21.51 for centrifugally cast pipe. The pipe shall be manufactured of iron having acceptance values of 60-42-10.

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 seal 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.

Ductile iron pipe shall be furnished with wall thickness in accordance with the following schedule (or heavier), unless noted otherwise on the Drawings (Thickness Class 50).

<u>Nominal Pipe Diameter</u>	<u>Minimum Wall Thickness</u>
6"	0.25"
8"	0.27"
10"	0.29"
12"	0.31"
16"	0.34"
18"	0.35"
20"	0.36"
24"	0.38"
30"	0.39"
36"	0.43"

Ductile iron pipe for force mains shall be at least Thickness Class 51 unless shown otherwise on the Drawings.

Ductile iron pipe on piers or in tunnel/bore shall be at least Thickness Class 52 unless shown otherwise on the Drawings.

All ductile iron pipe shall be first quality, with manufacturer's identification and pipe class clearly shown on each section.

Pipe manufacturer shall furnish, upon request, the test date for quality control during the manufacturing period for pipe furnished on the project. Testing and inspection shall be in accordance with ASA A21.51. Tests to include hydrostatic test (500 psi - 10 sec.); tensile test; impact test; one sample to be taken during each casting period of approximately 3 hours.

10. POLYVINYL CHLORIDE (PVC) SEWER PIPE

PVC sewer pipe may be used for 18-inch gravity sewer lines or smaller. PVC sewer pipe shall be SDR 35, or heavier, manufactured in accordance with ASTM D-3034, latest revision, for type PSM sewer pipe and fittings, 4-inch through 15-inch; ASTM F-679 (wall thickness T-1), 18-inch through 27-inch. Pipe shall be furnished in lengths not exceeding 13 feet. Pipe shall be furnished with integral bells; gaskets and lubricants shall be furnished by the pipe manufacturer. Pipe and fittings shall be made of PVC plastic having a cell classification of 12454-B or 12454-C as defined in ASTM D-1784.

Joints shall be compression type utilizing an elastomeric gasket providing a positive seal against groundwater and root intrusion as well as sewage leakage and shall be in accordance with ASTM D-3212. Gaskets shall comply with physical requirements specified in ASTM F-477, latest revision. Lubricant shall be furnished with the gaskets and shall be entirely compatible with gasket and pipe material.

Joints shall show no signs of leakage when tested as follows (supersedes ASTM D-3034): Typical joint assembly shall be subjected to internal hydrostatic pressure of 10.8 psig for 10 minutes without leakage; assembly shall also be subjected to internal vacuum of 22 inches of mercury or external pressure of 10.8 psig for 10 minutes without leakage. The above internal pressure and vacuum (or external pressure) tests shall be run on a typical joint assembly in concentric alignment and in a position of angular deflection to at least 3.

Testing and inspection of all pipe shall be done at the factory with a certified copy of test results furnished to the Engineer prior to any pipe being installed. Tests shall be done in accordance with ASTM D-3034 or ASTM F-679 and shall include: Pipe and Fitting Dimensions; Pipe Flattening; Impact Resistance; Pipe Stiffness; Joint Tightness; and Extrusion Quality. At least 1% of the production of each size furnished for this project shall be tested.

Each pipe section shall be marked with the following information:

4-inch to 15-inch:

Manufacturer's name or trademark; nominal pipe size; PVC cell classification; Legend "Type PSM SDR 35 PVC Sewer Pipe"; ASTM D-3034.

18-inch:

Manufacturer's name or trademark; nominal pipe size; PVC cell classification; Legend "PS 46 PVC Sewer Pipe"; ASTM F-679.

11. POLYVINYL CHLORIDE (PVC) CLASS 200 PRESSURE SEWER (FORCE MAIN)

PVC force main pipe, where designated on the Contract Drawings and in Bid Proposal for this Contract, shall conform to class 200 rating or heavier manufactured in accordance with ASTM D-2241, latest revision. All pipe shall be manufactured from Class 12454-B polyvinyl chloride plastic (PVC 1120) as defined by ASTM D-1784. The pipe shall have NSF approval. The following tests 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.

<u>SDR</u>	<u>Pressure Rating</u>	<u>Pressure, psi</u>
13.5	315	1,000
17.0	250	800
21.0	200	630

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

Bell Dimensions 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 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 sewer line routes will 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.

Compression joints 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.

Fittings for Class 200 PVC pressure pipe 2 inches in diameter shall be of the solvent weld type and shall be designed to withstand the same pressure as required for the pipe. Fittings shall be fabricated by the manufacturer of the pipe used and manufacturer shall be capable of supplying fittings with any combination of spigot (plain) end and socket (ball). Solvent welded joints shall conform to ASTM D-2241.

Furnish detection tape as per specifications in this section.

12. POLYVINYL CHLORIDE (PVC) PRESSURE SEWER

C-900 PVC pressure sewer pipe, where designated on the Contract Drawings and in the Bid Proposal shall conform to ANSI / AWWA C-900 manufactured in accordance with ASTM D-2241, 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.

<u>SDR</u>	<u>Pressure Rating</u>	<u>Minimum Bursting Pressure, psi</u>
14	200	985

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 sewer 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
- SDR or class
- Manufacturer
- NSF Seal of Approval
- AWWA C-900

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

Pressure Class at 73.4° shall be 200 PSI (DR 14), (working pressure 200 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-900 pressure pipe 4-inch through 12-inch shall be cast iron or ductile iron conforming to USA Std. A21.10 or compact ductile iron conforming to USA Std. A21.53-84, latest revision. Fittings shall have interior lining and exterior coating as specified for ductile iron pipe. Fittings for 12-inch and smaller pipe may be either cast iron or ductile iron.

13. PIPELINE DETECTION TAPE AND TRACER WIRE

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 a minimum of 5.5 mils thickness, and continuously printed in permanent ink to indicate caution for a buried sewer line below.

All pressure sewers and force mains not constructed of ferrous material shall be installed with detectable tape and tracer wire.

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 brightly colored (Green) to contrast with soil and shall bear the imprint "CAUTION -- SEWER LINE BURIED BELOW." Tape shall be Terra-Tape as manufactured by Reef Industries, Inc. or approved equal.

Additionally, the Contractor shall provide and install a 14-gauge insulated copper wire on top of the newly installed PVC force main or pressure sewer main. (See Special Detail in Contract Drawings.)

14. IRON PIPE 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.

All fittings, valves and etc. shown on the drawings to be restrained shall be assembled to the ductile iron pipe by the use of pipe retainer glands similar to Series 100 EBAA iron or approved equal. This is in addition to or in lieu of standard concrete thrust blocking. The cost of providing and installing retainer glands on all fittings, valves, etc. shall be merged into established unit price items.

15. SEWER FITTINGS AND ADAPTERS

Fittings and adapters for use with PVC or D.I.P. pipe shall be manufactured in accordance with the Specifications for the respective types of pipe.

16. COMBINATION AIR AND VACUUM RELIEF VALVES FOR 4-INCH AND LARGER FORCE MAINS

Automatic combination air and vacuum valves shall be A.R.I., Model D-020 (in stainless steel) (w/attachments) or approved equal as per special detail on the Contract Drawings.

17. AUTOMATIC AIR RELEASE VALVES FOR PRESSURE SEWERS 3-INCH AND SMALLER (FORCE MAINS)

Automatic air release valves shall be A.R.I., Model #D-025 (in nylon) (w/attachments) short body or approved equal as per special detail on the Contract Drawings.

18. 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 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 pressure up to 200 psi and shall be equal to latest specifications of AWWA C-509 in all respects. Valves shall be equal to Mueller A2370-20 unless otherwise shown on project drawings.

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

19. MANHOLE SEALING AND PROTECTIVE COATING

Manhole sealing involves materials to be used for sealing existing manhole sidewalls and/or inverts. For voids, brickwork joints, leaks, and/or invert work required, a Portland cement based hydraulic cement as manufactured by Preco Industries Ltd., Plainview, New York or equal shall be used.

Materials for sealant applications shall be Durpal, Drycon Grey, Drycon White, Brush-Bond, or equal. This material shall be a Portland cement slurry which consists of Portland cement and finely graded mineral fillers and inorganic co-polymer additives which prevents seepage of water through the manhole inverts, benches and sidewalls under a hydrostatic pressure.

The Contractor shall submit materials to be used to the Engineer for review and approval.

The cured system shall exhibit the following properties:

- | | | |
|----|-----------------------------------------|------|
| 1. | TENSILE STRENGTH, psi
ASTM C-190 | 745 |
| 2. | COMPRESSIVE STRENGTH, psi
ASTM C-109 | 5715 |
| 3. | FLEXURAL STRENGTH, psi
ASTM C-348 | 1585 |

4.	BRICK BOND STRENGTH, psi ASTM C-321	475
5.	SHEAR BOND STRENGTH ASTM C-109	775
6.	ABRASION RESISTANCE (percent weight loss) ASTM C-241	1.15
7.	IMPACT STRENGTH Inch Pounds	16
8.	WATER VAPOR TRANSMISSION RATE Perms 1/4" Thick Specimens ASTM E-96	3-7
9.	WATER ABSORPTION (percent water absorbed) ASTM C-140	2
10.	FREEZE THAW RESISTANCE (cycles passed) ASTM C-291	60

Where specified on the Contract Drawings and in the Proposal Section, the Contractor shall furnish and apply to the interior of manholes a chemical-resistant epoxy (Fosroc Epoxy Liner) as manufactured by Fosroc, Inc. of Plainview, New York or approved equal

20. MANHOLE/VALVE MARKERS

Manhole/valve markers, if required, shall be Carsonite Markers as supplied by Consolidated Pipe and Supply Company, Inc., Nashville, Tennessee or approved equal.

21. REDUNDANT CHECK VALVE

Each service pressure line and/or connection assembly shall include a check valve for installation in the discharge line between the grinder pump and the sewer force main to ensure maximum protection against backflow in the event of sewer service line break.

The valve shall be 1-1/4-inch E-1 (Environment One Corporation) glass line check valve.

22. SMALL MISCELLANEOUS VALVES

Unless otherwise shown on the Drawings, gate valves 2-inch and smaller shall be all-bronze, single wedge disc, non-rising stem, and handwheel operated. Such valves shall be Crane No. 438, Lunkenheimer Figure 2129, or equal, for screwed end valves, and Crane No. 1320, Lunkenheimer Figure 2133, or equal, for solder joint valves.

Check valves 2-inch and smaller shall be bronze body, composition disc, with screwed ends, similar to Crane No. 34-1/2, Lunkenheimer Figure 230-70, or equal.

Standard screwed end globe valves 2-inch and smaller shall be bronze valves with plug disc and shall be Crane No. 14-1/2 P, Lunkenheimer Figure 73-PS, or equal. Needlepoint globe valves 3/4-inch and smaller shall be bronze valves similar to Crane No. 88, Jenkins or equal.

23. VALVE BOXES

Valve boxes for pressure sewer valves, cleanout and service connections shall be as indicated on the Contract Drawings or a standard plastic meter box with a nominal size of 16" x 10-3/4" x 12" and 6" extensions. The meter box shall be injection molded meeting ASTM D-2853-70, Class 1212. It shall be a rigid combination of polyolefin with inorganic component reinforcing and UV stabilizer additive to assure resistance to material degradation from ultraviolet light. The cover shall be molded of the same material and design with no molded protrusions for latching. A 2-1/2-inch diameter 16-gauge steel reflector with dichromate coating shall be applied to the underside of the plastic cover for electronic detection. The cover shall be green with the words "SEWER" imprinted on the top. If valve box is located in a roadway or roadway shoulder subject to traffic, then valve box shall be constructed of cast iron.

24. BALL VALVES

Valves on pressure sewers 1½-inch through 3-inch shall be PVC ball valves of true union design with permanently lubricated teflon seats and elastomer "O"-ring seals. The valves are to be opened and closed with a quarter turn. Working pressure at 70 degrees F shall be 150 pounds per square inch.

25. SEWER SERVICE CLEAN-OUTS, WYES, BOXES, AND COVERS

Typical sewer service clean-outs (6-inch or 4-inch) shall be installed as per Standard Details. The clean-out shall consist of a clean-out wye (no tees) along with a 45° bend. The 6-inch or 4-inch plug or cap shall be contained in a plastic (meter type) box.

The box shall be a minimum of 16" x 10-3/4" x 12" and 6-inch extensions made of injection molded plastic meeting ASTM D-2853-70, Class 1212, as manufactured by Brooks Products, Inc. or approved equal. The cover shall be green with "SEWER" imprinted on the top. The box and lid shall have UV stabilizer additive to assure resistance to material degradation from ultraviolet light. A 2½-inch diameter, 16-gauge steel reflector with dichromate coating shall be applied to the underside of the plastic cover for electronic detection.

If the valve box must be located in a roadway or roadway shoulder subject to traffic, then valve box shall be constructed of cast iron in accordance with the following:

Valve Boxes - Valve boxes are to be made of pre-cast concrete sections measuring 11" x 13-1/4" inside dimensions and 17" x 19-1/4" outside dimensions with the height of 12 to 15 inches. Reinforcement shall be placed and shall conform to the requirements of ASTM A-15 and ASTM A-305 for intermediate grade.

Footing blocks for standard concrete valve boxes are to be pre-cast in blocks measuring 12" x 12" x 4". No reinforcing steel is required in footing blocks.

Valve Box Frames and Covers shall be made of heavy cast iron and shall meet the requirements of ASTM A-48, Class 40.

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

The valve box frames and covers shall be as manufactured by Bouchard No. 8006, Roadway Type, Nashville Standard or equal. The cover shall be marked "SEWER."

26. 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 joints shall be of leakproof construction either steel (in accordance with the following table) or bituminous-coated corrugated metal (conforming to AREA specifications), unless specifically shown otherwise on the Drawings or in the Specifications describing construction requirements at a particular casing location.

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
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. The ends of the casing shall be protected against the entrance of foreign material but not tightly sealed, in a manner approved by the Engineer.

"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."

The Contractor shall provide all materials to properly secure carrier pipe inside casing pipe in a manner approved by the Engineer.

27. TUNNEL LINER PLATE

The steel lining shall consist of 8-gauge steel plates conforming to ASTM A-569 not to exceed 18 inches wide. Each circumferential ring shall be composed of the number and length of plates to complete the required diameter. The Contractor shall submit details of the lining for approval.

The strength of the casing or tunnel lining will be determined by its section modulus. Thickness of the metal for these steel plates shall not be less than 8-gauge allowing for standard mill tolerance conforming to AASHTO M-167.

All plates shall be punched for bolting on both longitudinal and circumferential seams, shall be of the lap type with offset equal to gauge of metal for full width of plates including flanges and shall have staggered-bolt construction so fabricated as to allow the cross-section of the plate to be continuous through the seam. All plates shall be of uniform fabrication and those intended for one size tunnel shall be interchangeable.

The new material used for the construction of these plates shall be new and unused and suitable for the purpose intended. Workmanship shall be first class in every respect.

After the plates are formed to shape and after all holes are punched, the plates shall be galvanized conforming to ASTM A-123. Plates shall then be bituminous coated conforming to AASHTO M-190.

All nuts and bolts shall be galvanized and conform to ASTM A-307, Grade A and ASTM A-153.

Plates shall be fabricated with grout holes to facilitate grouting above and around the tunnel liner. These grout openings shall be 2-inch I.P.T. half couplings welded into a hole in the center corrugation of a plate, and a galvanized C.I. plug shall be provided for each opening to permit tight closure after grout holes so that the spacing of holes will be on a maximum spacing of 18-inch centers at the top of the tunnel and at the top quarter points, staggered with holes at the top.

Field coating material shall be asphaltic mastic, Trumball 5X or approved equal, and shall be applied with hydraulic spray equipment using a minimum of 2,400 pounds pressure at the nozzle tip. The material shall be supplied at spraying consistency and shall be applied both to the outside and inside of the liner plates. Plates may be hot-dipped to produce a similar coating.

28. TUNNEL LINER GROUT

The grout shall consist of Portland cement, water, sand and 2% approved additive (Bentorite, Septamine Seax, Hydrocide liquid, etc.). One part Portland cement with additive shall be combined to four parts clean sand and sufficient water added to provide a grout having the consistency of thick cream when well mixed.

29. TUNNEL BACKFILL

Material used to backfill the tunnel/bore shall be pea gravel as approved by the Engineer.

30. 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.

SEWERS, FORCE MAINS AND APPURTENANCES

SECTION 3

CONSTRUCTION

1. PRELIMINARY WORK

- 1.1 Surveying, Staking and Cut Sheets - The Engineer will provide adequate bench marks and control lines, but offset staking shall be the responsibility of the Contractor. The Contractor shall prepare cut sheets and submit them in quadruplicate for the Engineer's approval. The cut sheets shall have ground elevations at 25-foot intervals and at major changes of the ground profile (ditches, ledges, etc.). Two sets of the approved cut sheets will be returned to the Contractor. The Engineer shall check cut sheets before construction is started.

Alignment and grade shall be maintained by the use of offset hubs. There shall be at minimum:

- (1) Two (2) alignment and grade offset hubs at each manhole.
- (2) For use with batter boards: At a maximum interval of 50 feet (when sewer grade is less than 1%, maximum intervals shall be 25 feet).
- (3) For use with laser device: At 50 feet and 100 feet out of each manhole.

- 1.2 Location and Protection of Underground Utilities - Prior to trenching the Contractor shall determine, insofar as possible, the actual location of all underground utilities in the vicinity of these operations and shall clearly mark their locations so 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 Minimum Horizontal and Vertical Clearances for Sanitary Sewers and Water Mains - Where sewer lines pass over or within 4 feet of water mains, the sewer line shall be encased in concrete. A vertical clearance of 18 inches shall be maintained between sanitary sewer and water main. A horizontal clearance of 10 feet shall be maintained between sanitary sewers and water mains.
- 1.4 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.

- 1.5 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 as well as other damages outside the permanent easement or rights-of-way resulting from the Contractor's activities.

2. EXCAVATION

- 2.1 General - The Contractor shall perform all required excavation and backfilling incidental to the installation of the sewers, manholes, force mains, 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 be responsible for storage of excavated material, disposal of surplus excavated material, trench dewatering and other operations incidental to excavation and backfilling operations.

The Contractor's attention is directed to the requirements on the Contract Drawings where portions of trench excavation prohibits any blasting operations.

- 2.2 Classification of Excavation - All excavation shall be unclassified and the cost of excavation shall be merged into the price per foot for the pipe sewer. 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 neatly excavated to the alignment and depth required for the proper installation of pipe, bedding material, and appurtenances. 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 trenches 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 the 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 the 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 over-depth 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 on private property.

- 2.5 Excavation for Structures - Excavation for manholes, junction boxes, piers, or other structure shall be only as large as may be required for the structure and for working room around the structure. 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. Rock excavation for manhole slabs shall extend only to the bottom and edges of the slab.

Care shall be taken as the excavation approaches the desired grade to avoid over-depth 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. The Contractor is cautioned to use care in leveling prior to the setting of precast manholes of junction boxes.

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 the bearing capacity of the material for the load to be supported; but, in any case, he shall provide written instructions to the Contractor as to the procedure to be followed.

- 2.6 Rock Excavation - 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. If track drills are used for drilling rock, water must be provided and used with the drilling operation to control dust.

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 storing 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.

Excavated rock that cannot be utilized in trench backfill as permitted under paragraph 4 of this Section shall be removed from the site and disposed of as directed by the Engineer.

- 2.7 Sheeting and Shoring - The Contractor shall provide such bracing, sheeting, or shoring as may be necessary for the protection of life and property. Sheeting will be required where necessary to restrict the trench width to acceptable limits above the top of pipe.

Sheeting, shoring, or bracing shall conform to applicable safety codes and shall be left in place until the pipe is laid, checked, and backfilled to a safe level at or above top of pipe. The bracing or sheeting may then be removed in an approved manner unless the Engineer specifically directs that the sheeting be left in place. Where the sheeting is left in place, either at the direction of the Engineer or option of the Contractor, the sheeting shall be cut off at least 18 inches below the finished ground level.

Care shall be taken in removing sheeting to avoid weakening the trench, increasing the backfill load, or endangering adjacent property. Voids left by the removal of sheeting shall be filled in and compacted with suitable material using tamps intended for this purpose.

- 2.8 Storage of Excavated Material - Excavated material shall be deposited in such a manner as to avoid danger to workmen, sewer, or traffic and to cause minimum inconvenience through blocking of drives, sidewalks, natural drains, etc. Where indicated on the Drawings or necessitated by conditions prevailing, the Contractor shall haul away and stockpile excavated material.
- 2.9 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.
- 2.10 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 utility. 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 utility.

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 City 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.

- 2.11 Special Conditions - Special care must be exercised in excavation under or near State Highway, railroads, or other areas as designated on the Drawings in order to avoid or minimize delays or injuries resulting therefrom. 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 paragraph 6 of this Section - Special Construction Items.

3. INSTALLATION OF SEWER PIPE AND ACCESSORIES

- 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, shall be free of water, and bedding, as specified, shall be in place.

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 pipes 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.

Alignment and grade shall be carefully maintained during the laying operations. The method used for maintaining grade and alignment must be acceptable to the Engineer and must produce the desired results. The top of the bedding material must be brought to the exact grade and must be shaped so as to provide effective support for the bottom quadrant of the pipe except at the bells.

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.

Conditions permitting, property clean-up and restoration shall begin and be prosecuted to completion on a timely basis as set forth in the Special Conditions of the Contract. Failure by the Contractor to prosecute and complete property clean-up and restoration on a timely basis will result in the withholding of 15% of the payment due for that part of the completed pipe sewer for which clean-up and property restoration has not been accomplished. This 15% withholding constitutes payment for work not completed. This amount shall be in addition to the retained percentage for work completed. This withholding of 15% will continue on subsequent payment estimates until such time as clean-up and property restoration is in compliance with the Special Conditions of the Contract.

- 3.2 Removal of Water - The Contractor shall be responsible for handling run-off, groundwater, 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 shall be kept out of trenches and other excavations to the extent necessary to protect the supporting strength of the foundation material, permit efficient and satisfactory assembly or replacement of facilities, and to prevent floating or misalignment. 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 Pipe Bedding and Envelope - Trench width from a point 1 foot above the top of the pipe (top of "pipe zone") down to bottom of trench shall be held to a minimum, consistent with the provision of necessary space for proper assembly of the pipe. In general, the trench width shall not exceed the outside pipe diameter plus 16 inches.

A minimum of 4 inches of crushed stone bedding shall be placed in the bottom of the trench to provide continuous support of the bottom quadrant of the pipe; minimum of 6 inches of crushed stone bedding in rock. The Contractor shall bring the crushed stone bedding up to the level required to provide support of the bottom quadrant and shall then shape the bedding to receive the pipe. Bell holes shall be dug so that the bottom of the bells will not support the pipe.

After the bedding has been shaped and the pipe has been installed, the pipe shall be carefully backfilled with crushed stone bedding material placed by hand and compacted up to a level 12 inches above the top of the pipe. The pipe bedding and envelope shall consist of clean, crushed stone, free from debris and other objectionable materials, placed in even layers simultaneously on each side of the pipe, and shall be thoroughly consolidated to completely fill the haunches of the pipe. Consolidation by jetting will not be allowed. The furnishing and installation of the crushed stone bedding and envelope shall be considered as an integral part of the pipe installation and its cost merged into the unit price item for pipe installation.

The crushed stone envelope for ductile iron and reinforced concrete pipe outside of roadway will not be required above the pipe centerline if the Contractor hand-places a select earth envelope of loose native soil or select material excavated from the trench, free of deleterious substances such as rocks, roots, stumps, humus material, frozen earth, other organic material and any other objectionable material around the pipe. The envelope shall be lightly tamped to 85% compaction around the pipe in lifts not to exceed 6 inches to a point up to 12 inches over the top of the pipe. Consolidation by jetting will not be allowed. The furnishing and installation of the crushed stone 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 D.I.P or PVC pipe. No separate payment shall be allowed.

- 3.4 Pipelaying - After the pipe has been cleaned and inspected for defects and lowered into the trench, the mating surfaces of the compression joint shall be wiped clean and coated with lubricant of a type supplied by the pipe manufacturer. The pipe shall then be assembled with due care being taken to insure that the spigot end of the pipe is shoved home and that the pipe is left in proper grade and alignment.

Whenever pipe laying operations are to be discontinued for a period of time exceeding 2 hours, the end of the pipe shall be carefully secured to avoid displacement or misalignment and a tight fitting plug or stopper shall be placed in the line. Upon resumption of laying operations, the plug or stopper shall not be removed from the line until any water, mud or other debris has been removed to avoid entry into the completed section of the sewer.

Installation of sewer pipe including force mains shall conform to provisions of these Specifications and recommendations of the pipe manufacturer. Installation instructions provided by the pipe manufacturer shall be available at all times at the location of the work.

The proper gaskets and lubricants shall be furnished by the pipe manufacturer and lubricants shall be delivered to the job site in properly labeled, unopened containers.

Wye branches or tees and other fittings shall be placed in the sewer line as shown on the Drawings or as directed by the Engineer as pipe laying progresses. The Contractor shall keep accurate records of their location.

Cradle, encasement, or cap concrete shall be provided in locations as shown on the Drawings or where the nature of the work requires such protection. In the event the cradle, encasement, or cap concrete is required but is not shown on the Drawings, the Contractor shall obtain written authorization from the Engineer for the installation of such protection. Cradle, encasement, and cap concrete will be measured in cubic yards, based on the linear feet of cradle, encasement, or cap concrete furnished and placed on each pipe size, multiplied by the cubic yards per linear foot for each pipe size indicated in the cradle tabulation or shown on the encasement cross-sections included in the Contract Drawings. The unit bid and Contract price for cradle, encasement, or cap concrete shall include the cost of removing and disposing of the added excavation required to accommodate these materials.

Whenever it is necessary to cut a joint of pipe in order to fit the trench conditions, the cutting shall be done using the equipment as recommended by the manufacturer for the specific type of pipe involved. The cut shall be made so as to leave smooth end at right angles to the axis of the bore and the end shall be beveled or finished as required to make the joint without risk or damage to the gasket.

3.5 Installation of Pressure Sewer - Lay the pressure sewer to and keep it at the lines and grades required by the Drawings. All fittings shall be at the required locations and spigots well centered in the bells.

Unless otherwise indicated by the Drawings, all pressure sewers shall have at least 30 inches of cover. No departure from this policy shall be made except at the order of the Sewer Department.

Provide and use tools and facilities that are satisfactory to the Sewer Department and that will allow the work to be done in a safe and convenient manner. Use a derrick, ropes, or other suitable equipment to lower all pipe fittings into the trench one piece at a time. Carefully lower each piece so that neither it nor any protective coating or lining it may have will be damaged. Under no circumstances, drop or dump pressure sewer materials into the trench.

Lower no pipes and fittings into the trench until they have been swabbed to remove any mud, debris, etc. that may have accumulated within them. After the pipe has been lowered, remove all unnecessary materials from it. Before any pipe is laid, brush and wipe clean the outside of its spigot end and the inside of its bell and ensure that the pipe is dry and oil-free.

Take every precaution to keep foreign material from getting into the pipe while it is being placed in the line. If the crew laying the pipe cannot put it into the trench and in place without allowing earth to get inside it, then place a heavy, tightly woven canvas bag of suitable size over each end of the pipe and leave it there until it is time to connect that pipe to the one adjacent to it.

Place no debris, tools, clothing, or other materials in the pipe during laying operations.

After a length of pipe has been placed in the trench, center the spigot end in the bell of the adjacent pipe and then insert to the depth specified by the manufacturer and bring to the correct line and grade. Secure the pipe in place by tamping an approved backfill material around it.

Bell holes shall be big enough so that there is ample room for the pipe joints to be properly made. Between bell holes, carefully grade the bottom of the trench so that each pipe barrel will rest on a solid foundation for its entire length.

Whenever pipe laying is not in progress, close the open ends of pipe in the trench that cannot be completed until a later time with packing in order to make them as watertight as possible. This shall be done not only at the end of each working day but also before work is stopped for lunch periods, bad weather, or any other reason. If there is water in a trench, this seal shall remain in place until the trench has been pumped completely dry.

The cutting of pipe so that fittings or closure pieces can be inserted shall be done in a neat and workmanlike manner and without any damage to the pipe. Follow the manufacturer's recommendations concerning how to cut and machine the ends of the pipe in order to leave a smooth end at right angles to the pipe's axis.

The flame cutting of pipe by means of an oxyacetylene torch will not be allowed.

Unless otherwise directed by the Engineer, lay pipe with the bell ends facing in the direction of laying.

Wherever pipe must be deflected from a straight line (in either the vertical or horizontal plane) in order to avoid obstructions of plumb stems or wherever long radius curves are permitted, the amount of deflection shall not exceed that necessary for the joint to be satisfactorily made, nor that recommended by the pipe manufacturer, and shall be approved by the Engineer.

Lay no pipe in water or when it is the Engineer's opinion that trench conditions are unsuitable. If crushed stone is used to improve trench conditions or as backfill for bedding the pipe, this shall be considered incidental to the project.

Install thrust blocks wherever the force main changes direction (e.g., at tees and bends), at dead ends, or at any other point where the manufacturer recommends and/or the Engineer indicates that they are to be used.

Make all joints, whether standard mechanical or push-on joints, in conformance with the recommendations of the joint manufacturer as approved by the Engineer.

The detectable tape and 14-gauge insulated copper tracer wire shall be buried in the utility line trench directly above the installation to be identified. The tracer wire shall be placed directly on top of the pressure sewer and the marking tape shall be placed 15-inches from finish grade of the trench. The tape shall be placed in the trench with the printed side up and be essentially parallel to the finished surface. The Contractor will take necessary precautions to ensure that the tape and tracer wire are not pulled, distorted, or otherwise misplaced in completing the trench backfill. Tape and wire shall be placed in all trenches.

3.6. Pressure Sewer Service Assemblies

Materials

Ball Valve: The valve on the service line at the connection to the main shall be a PVC ball valve of true union design with permanently lubricated Teflon seats and elastomer "O"-ring seals. The valves are to open and close with a quarter turn.

Working pressure at 70 degrees F shall be 150 pounds per square inch.

Redundant Check Valve (E-1 Glass Line): Each service line shall include a check valve for installation in the discharge line between the grinder pump and the pressure sewer to ensure maximum protection against backflow in the event of sewer service line break.

Installation

The service line shall have a minimum of 24 inches of cover.

The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finish pavement or centered over the valve and cleanout or approximately 1/2-inch above the ground surface or such other level as may be directed.

3.7. Pressure Sewer Valves

Air Release Valves: At the locations shown on the Contract Drawings and in accordance with these Specifications, install an air release valve. The valve shall have a body of cast iron construction, a stainless steel float and a Buna-N seat. The valve shall have a 2-inch inlet.

Fittings: Fittings shall be of the solvent welded type for use in conjunction with valves. Fittings shall be fabricated by the manufacturer of the pipe used.

Valve Boxes Shall be as indicated on the Contract Drawings: Unless otherwise shown, valve boxes shall be a standard plastic meter box with a nominal size of 36" x 15" x 18" and a 6" extension. The meter box shall be injection molded meeting ASTM D-2853-70, Class 1212. It shall be a rigid combination of polyolefin with inorganic component reinforcing and UV stabilizer additive to assure resistance to material degradation for ultraviolet light.

The cover shall be molded of the same material and designed with no molded protrusions for latching. A 2-1/2-inch diameter 16-gauge steel reflector with dichromate coating shall be applied to the underside of the plastic cover for electronic detection. The cover shall be green with the words "CONTROL VALVE" imprinted on the top.

3.8. Laying Ductile Iron Pipe in Gravity Sewers - Unless otherwise indicated, ductile iron pipe shall be laid with slip type compression joints equal to the manufacturer's standard for pressure water pipe, and assembly of the joints shall be in accordance with the manufacturer's recommendations using lubricant and accessories as provided by the pipe manufacturer.

In stream crossings, ravines, shallow cuts and other locations where the pipe will not be laid on bedding placed on original subgrade, the pipe shall be supported on concrete piers as detailed on the Drawings or as directed by the Engineer. Piers shall be of Class A concrete with reinforcing as shown. The tops of piers shall be carefully set at the exact elevation and shall be shaped so as to provide support for the bottom half of the pipe with allowance being made for the outside diameter of the pipe plus the thickness of a layer of tarred felt around the outside of the pipe. After the concrete has attained satisfactory strength, the ductile iron pipe may be installed across the piers using one or more layers of tarred felt between the surface of the concrete and the outside diameter of the pipe. The Contractor may, at his option, install the pipe to exact grade and alignment using temporary supports and then construct the permanent piers for the pipe, provided suitable precautions are taken to avoid any misalignment during the construction of the piers.

3.9 Laying Sewage Force Mains - Sewage force mains shall be constructed of ductile iron or Class 200 PVC pressure pipe as shown on the Construction Drawings or as directed by the Engineer.

Trenches for sewage force mains shall be deep enough to provide no less than 30 inches of cover for installed pipe. The bottom of the trench shall be carefully graded to provide continuous support for the bottom quadrant of the pipe, except at bell joints where bell holes shall be dug. In the event rock is encountered in the trench, such rock shall be removed down to an elevation 6 inches below the outside of the pipe and 6 inches beyond the outside diameter of the pipe on the sides. Where rock is removed in the bottom of the trench, the trench bottom shall be brought back to grade using crushed stone.

The Contractor will be required to exercise care to maintain satisfactory grades and alignments and avoid unnecessary kinks, sags, or high points. Exact grades or centerline elevations are not indicated or required, but grades shall be such as to provide a continuous upward slope to discharge point or other summit point where facilities for release of air shall be provided. In trenching for sewage force mains, the Contractor will be required to excavate far enough ahead of pipe laying to be made. Should the Contractor fail to observe this precaution and encounter an obstruction necessitating adjustment in pipe grade or alignment, he shall remove and replace such joints of pipe already laid as may be necessary in order to accomplish the desired correction without humps or sags.

Changes in grade or alignment may be made by means of deflection in pipe joints provided that the recommended deflection as shown in published tables supplied by the pipe manufacturer are not exceeded and that the work required for the installation of the line does not encroach on adjoining property not within the granted easement. The Contractor shall have on hand at the site of work a table showing the permissible deflections whenever the pipelaying is in progress.

Assembly of the pipe joints shall be in accordance with the manufacturer's instructions using gaskets and lubricants supplied by the pipe manufacturer. Pipe fittings shall be supplied by the pipe manufacturer. Pipe fittings shall be provided as indicated on the Drawings as directed by the Engineer. Fittings shall be suitably braced in accordance with standard details to avoid the pipe from being blown apart due to internal pressure. Bracing shall be sufficient to withstand normal operating pressure plus 50 psi with due allowance for the character of soil against which the braces will be placed. Pipe bedding and envelope for D.I.P. or Class 200 (PVC) pressure force main shall be as specified in 3.3 of this section.

All pressure sewers and force mains not constructed of ferrous material shall be installed with detectable tape and tracer wire.

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 a minimum of 5.5 mils thickness, green in color, and continuously printed in permanent ink to indicate caution for a buried sewer line below.

Detectable tape shall be 3 inches wide (6 inches wide - for Tullahoma Utilities only) 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 brightly colored (Green) to contrast with soil and shall bear the imprint "CAUTION -- SEWER LINE BURIED BELOW." Tape shall be Terra-Tape as manufactured by Reef Industries, Inc. or approved equal.

Additionally, the Contractor shall provide and install a 14-gauge insulated copper wire on top of the newly installed PVC force main or pressure sewer main. (See Special Detail in Contract Drawings.)

- 3.10 Laying PVC Sewer Pipe - Installation of the pipe shall be in strict accordance with ASTM Designation D-2321, "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe." Due precautions must be taken in placing the backfill under the pipe haunches and on the sides of the pipe to ensure proper support of the pipe and at the same time avoid any misalignment. Attention is called to the fact that these Specifications limit pipe diametric deflection to 5%.

After the pipe has been placed and brought to grade, the pipe shall be held in place while crushed stone is carefully worked in around the pipe for firm support of bottom and sides. Extreme care shall be taken in backfilling around the pipe to avoid raising the pipe above the grade line, but at the same time provide the required support. The crushed stone shall be placed in small quantities and distributed by hand up to the top of the pipe. Backfill shall be compacted on the sides by means of small hand tamps or vibrators, but excessive tamping over the top of the pipe should be avoided.

Should the bottom or sides of the trench be unstable to the extent that firm support cannot be provided for the bottom or sides of the pipe, this condition shall be reported to the Engineer so that suitable corrective measures may be authorized.

PVC pipe shall pass a go/no-go mandrel inspection sized to 95% of the pipe diameter of the actual pipe diameter after the pipe is in place and completely backfilled. No testing shall be performed on PVC pipe until after backfilling (see testing specifications).

Contractor shall furnish labor and equipment and perform the mandrel inspection in the presence of the Engineer. Cost for performing this test shall be merged into the unit price bid for sewers.

- 3.11 Service Connections - Sewer service lines shall be provided as shown on the Drawings or as directed by the Engineer. The service connection shall be made in the manner as directed with the size and type pipe as indicated. Service pipe shall be laid on a minimum slope of 1/4-inch per foot unless otherwise directed in writing. Excavation, laying and backfilling for service lines shall conform to applicable specifications for main sewer.

NOTE: 90° Bends are not permitted.

Service line connection shall include the furnishing and installation of 6-inch connection openings for riser pipes for existing and/or future house services. Opening shall be "T" branches. The connection shall be plugged either at the "T" connection, or at the end of the 6-inch service line or, in some cases, will be connected by 4-inch Schedule 40 pipe to the existing residences.

In cases where unrepairable damage is required by sewer construction to the homeowners' septic/disposal fields, the sewer service may, if directed by the Engineer, be connected to the existing residences, this work will be performed in full compliance with the Standard Plumbing Code, Contract Drawing, and local plumbing requirements. All costs associated with this work shall be merged into the unit prices established for 4-inch PVC sewer services. This unit price shall also include all costs for required clean-outs on the 4-inch sewer service reconnections.

As directed by the Engineer, the Contractor shall install a clean-out at the street right-of-way for every house service connection. These 6-inch clean-outs shall be paid for based on the unit price bid item for 6-inch clean-outs at connection points in accordance with the details shown.

Pipe stoppers for D.I. service and main line pipe shall consist of Standard C.I. bell and spigot caps and plugs.

Pipe stoppers for PVC service line pipe shall consist of 6-inch quick caps w/stainless steel clamps as manufactured by Fernco, or approved equal.

Payment will be made for each plugged connection installed and shall only include the difference in price between the length of pipe containing the plugged opening and an equal length of plain sewer pipe comprising the main sewer.

3.12 Pipe Sewers in Tunnel and/or Bore - All work performed beneath existing structures, across railroad right-of-ways, and under pavements shall be performed in accordance with the requirements of the parties or agencies having jurisdiction over these locations. The Contractor shall contact the parties or agencies prior to starting work and shall meet all requirements of the parties or agencies in regard to methods of construction and the parties or agencies in regard to methods of construction and the safety precautions to be taken in performing the tunnel work. All costs involved in meeting these requirements shall be paid for by the Contractor and no additional compensation will be allowed.

A. Bore Method

At the Contractor's option and with consent of the parties or agencies having jurisdiction, steel pipe or other acceptable material may be jacked or bored into place in lieu of a liner plate tunnel provided the Contractor be responsible for all approvals from the parties and/or agencies having jurisdiction including, but not limited to, furnishing complete details of the methods to be employed for approval.

Refer to casing pipe specifications in Material Section for Bores.

The sewer pipe shall be adequately secured in the tunnel/bore casing by a method approved by the Engineer. At a minimum, the carrier pipe must be secured and noncompressible sand or pea gravel shall be placed in the space between the liner/casing and the carrier pipe by a method approved by the Engineer. Concrete bulkheads will be placed at the end of the tunnel, thickness and placement of which shall be subject to the Engineer's approval. Excavation shall be unclassified and no distinction made between rock and other materials excavated, with the cost of excavation merged in the unit price per foot of pipe sewer in tunnel/bore.

B. Tunneling Method

Construction of the culvert shall be carried on in such a manner that settlement of the ground surface above the culvert shall be held to an absolute minimum. Where ground conditions are unstable, poling plates or poling boards shall be used to prevent caving of material above the tunnel before the liner plates can be installed.

Steel liner plates shall be installed as soon after the excavation is removed as possible and excavation shall not be removed more than 24 inches ahead of the installed liner plates. Excavation shall be carried on in such a manner that voids behind the liner plates will be held to a minimum. However, should any boulders larger than 1 foot in diameter be encountered, they shall be removed so that none are closer than 6 inches to the outer face of the liner. Where boulders or piling are excavated, the holes shall be backfilled by tamped material.

The steel lining shall consist of plates not to exceed 18 inches wide. Each circumferential ring shall be composed of the number and length of plates to complete the required diameter. The Contractor shall submit details of the lining for approval.

The strength of the casing or tunnel lining will be determined by its section modulus. Thickness of the metal for these steel plates shall not be less than 8 gauge allowing for standard mill tolerance.

All plates shall be punched for bolting on both longitudinal and circumferential seams and shall be so fabricated as to permit complete erection for the inside of the tunnel. The longitudinal seam shall be of the lap type with offset equal to gauge of metal for full width of plates including flanges and shall have staggered bolt construction so fabricated as to allow the cross-section of the plate to be continuous through the seam. All plates shall be of uniform fabrication and those intended for one size tunnel shall be interchangeable.

The material used for the construction of these plates shall be new and unused and suitable for the purpose intended. Workmanship shall be first-class in every respect.

After the plates are formed to shape and after all holes are punched, the plates shall be galvanized on all surfaces by the hot-dip process. A coating of prime western spelter, or equal, shall be applied at the rate of not less than 3 ounces per foot of double-exposed surface. If the average spelter coating as determined from the required samples is less than the amount specified above, or if any one specimen shows a deficiency of 0.2 ounce, the lot shall be rejected. Spelter coating shall be of first-class commercial quality free from injurious defects such as blisters, flux and uncoated spots.

All nuts and bolts shall be galvanized.

Plates shall be fabricated with grout holes to facilitate grouting above and around the tunnel liner. These grout openings shall be 2-inch I.P.T. half couplings welded into a hole in the center corrugation of a plate and a galvanized C.I. plug shall be provided for each opening to permit tight closure after grout is pumped. All rings are to be provided with grout holes so that the spacing of holes will be on a maximum spacing of 18 inch centers at the top of the tunnel and at the top quarter points, staggered with the holes at the top.

Field coating material shall be asphaltic mastic, Trumball 5X, or approved equal, and shall be applied with hydraulic spray equipment using a minimum of 2,400 pounds pressure at the nozzle tip.

The material shall be supplied at spraying consistency and shall be applied both to the outside and inside of the liner plates. Plates may be hot-dipped to produce a similar coating.

When installing a liner plate by the tunneling method, the excavation shall be performed in such a manner that voids between the undisturbed earth and the liner plate shall be maintained at a minimum. Any void occurring shall be filled with a Portland cement and sand grout pumped under pressure through grouting openings in the liner plate.

Pumping of grout shall be done (1) at the completion of the installation of approximately each 9 feet of liner plate, (2) at more frequent intervals than 9 feet if conditions indicate the necessity, and (3) at the end of a work shift or for stopping of work for any reason.

Measurement for payment shall be for the linear feet of tunnel measured from the face of tunnel to the face of tunnel.

- 3.13 Manholes - Individual riser sections shall be furnished for the exact conditions to be encountered in the field. Misalignment of pipe openings with the "cast in" resilient connectors or steps within the section or with other sections shall be cause for rejection.

Precast manhole sections shall be joined with male and female ends joined together to provide a smooth uniform joint which shall be structurally sound and watertight. A flexible, acid and alkali-sewage and water-resistant sealant equal to Ram-Nek as manufactured by K.T. Snyder Company, Inc. shall be applied to the joint surface for placement of the next manhole section, casting ring, or casting. A maximum of 3 precast manhole castings rings may be used to adjust the casting to final grade.

Manholes shall be constructed on Class A concrete slabs with flow channel. Flow channels shall consist of smooth uniform cross sections conforming to the cross section of the pipes so as to provide a minimum of turbulence and avoid deposition of solids. Flow channels shall have a depth of about 8/10 of the pipe diameter. The finished floor of the manhole shall have a slope of approximately 1/2-inch from wall to channel to provide for proper drainage, but at the same time offer a safe footing for workmen. Brick or pieces of brick may be used for filler material in forming the flow channel and finished floor in the manholes provided that no brick shall be left within 1 inch of the finished surface.

Manhole frames, covers and steps shall conform to Section 2 of these Specifications. Manhole steps shall be staggered with even spacing of approximately 16 inches between steps. Manholes deeper than 6 feet to be located in paved streets where the top of the casting is flush with the pavement shall be provided with one backstep set opposite the staggered row of manhole steps.

Manholes shall have diameters as indicated on the Drawings. Where 5-foot or larger diameter manholes are called for, the diameter of the upper part of the barrel may be reduced to 4-foot subject to the following conditions:

1. Specified diameter must be maintained up to a point 5 feet above invert of incoming sewer or up to a point 2 feet above top of pipes entering or leaving manhole, whichever is greater.
2. Reduction in diameter must be made with an approved transition section having dimensions such as to maintain alignment of steps.

Drop connections shall be provided whenever an incoming sewer enters the manhole a sufficient distance above the outlet to permit the use of the drop connection fittings. Drop connections shall be one size smaller than the incoming sewer except that the minimum size drop shall be 8 inches in diameter. Where drop connections are required, the manhole base slab shall be extended to support the drop pipe and the entire drop pipe assembly shall be encased in Class C concrete having a minimum cover of 6 inches outside the pipe.

On precast manhole sections, no pipe opening may be cut or enlarged by use of sledge hammer or other impact-type tool which could cause structural damage to the riser section.

See "Materials - Section 2" regarding the requirement for XYPEX® C-1000 concrete admix for waterproofing and corrosive protection for all manholes on this project.

3.14 Connections to Structures - Connections of pipes to manholes or other large structures shall be made using short lengths of pipe to avoid stressing the pipe at the point where it is placed in the wall of the structure. Pipes entering or leaving masonry or concrete walls shall have one flexible joint located not more than 18 inches outside the structure wall followed by a length of pipe of more than 2 feet in length with another flexible joint at the end of the 2-foot pipe length in such a way as to provide for limited lateral or vertical movement of the pipe line as well as limited deflection. Ordinary compression-type joints of the types specified for gravity sewers shall be considered as having sufficient flexibility for this purpose. The supplier of the pipe for the sewer lines shall furnish with the pipe order the required number of special and short lengths of pipe for the Contractor to install the required flexible connections without improvising.

3.15 Connections to Existing System - No pipe shall be connected to the existing sewage system until all new upstream construction has been completed, is free of foreign materials, and obvious defects have been corrected. New lines, then, must remain disconnected from the existing system by actual physical separation by plugs of a type approved by the Engineer or by other means approved by the Engineer. The Contractor shall make connections to existing sewers in accordance with details as shown on the Drawings or as directed by the Engineer.

In all cases, the Contractor shall locate and uncover existing sewers and shall verify invert elevations before laying the connecting sewer so as to allow opportunity for making adjustments to compensate for discrepancies.

Work shall include any required stopping or diversion of flow in existing lines or structures and the necessary rebuilding of any manhole inverts to the lines shown generally on the Standard Detail sheet.

Note: Connections to existing structures shall be by the Kor-N-Seal method.

- 3.16 Manhole Replacements - The unit price items for manholes shall include removal of the existing manholes and disposing of the old structure at an approved landfill.

The Contractor shall deliver all removed and/or old manhole frames and covers to the Leitchfield Utilities Commission, Department of Public Works Yard.

- 3.17 Manhole Sealing and Protective Coating - Manhole sidewall, invert, and bench sealing and rehabilitation shall be performed on existing manholes indicated or as directed by the Engineer. The sealing of sidewalls and inverts in the manhole shall conform to the following specifications and Section 2 - Materials.

Safety regulations and precautions set out by the manufacturer and OSHA shall be strictly observed.

Manholes to be waterproofed and sealed must first be cleaned by high-velocity cleaning equipment to remove all foreign matter from the walls and base. This cleaning shall remove oil, grease, loose mortar, paints, protective coatings, efflorescence, laitance and curing compounds.

The Contractor shall use a spray from above of a 10 percent solution of muriatic acid. The Contractor shall wash this material off and the manhole allowed to dry.

The manhole and invert shall then be gone over by patching with a quick setting Portland Cement based hydraulic cement to seal all cracks, etc.

This work shall be done in complete accordance with the manufacturer's recommendations. For material requirements see Section 2 - Materials.

The manhole is now ready for the sealing application process. Mixing shall be as per the manufacturer's recommendations. The first coat shall be applied by vertical brush strokes so that all brick joints in the direction receive an adequate coating of material. The first coat will be white in color to ease inspection and make the second coat visually simple to apply. After the first coat has cured, the surface is ready for the second coat. This second coat will be gray in color and should be applied with horizontal brush strokes to insure complete coverage of joints.

The sealant coatings shall be applied and be capable of withstanding a hydrostatic pressure of 7 psi (16 feet of water).

As a final coating, the Contractor shall furnish and apply to the interior of manholes a chemical-resistant epoxy (Fosroc Epoxy Liner) as manufactured by Fosroc, Inc. of Plainview, New York or approved equal.

This sealing and waterproofing procedure shall be applied to the sidewalls, base, invert, and benches. As necessary to accomplish this work, the Contractor shall control the sewage flow through the manhole.

After all sealing, the Engineer and Contractor shall inspect the sealed manholes after rainfall events have sufficiently raised the ground water table.

This inspection shall be scheduled at a time to be determined by the Engineer.

Manholes which do not pass this inspection shall be resealed at no additional costs to the Owner.

The Contractor's attention is directed to the fact that most of the existing manholes do not contain steps installed in the sidewall. This may require the Contractor to perform some work by the use of short portable ladders or other equipment.

NOTE: Where protective coatings (Fosroc Epoxy Liner) are called out for manholes or vault structures the minimum coverage for the trowelable form shall be 1/8-inch in thickness. The minimum coverage for the sprayable form shall be 50 mils in thickness.

- 3.18 Automatic Combination Sewage Air and Vacuum Valves - Where shown on the Drawings or where directed by the Engineer, the Contractor shall install an automatic combination sewage air/vacuum valve for the sewer force main to allow for unrestricted venting and re-entry of air.

The combination sewage air valve installation shall be constructed in accordance with the Standard Detail Drawing. The combination valve shall be furnished with flushing accessories and shall have a 2-inch inlet and 2-inch outlet for the combination air and vacuum valve unless otherwise shown on the Drawings. The valve shall be an A.R.I., Model D-020 stainless steel Combination Sewage Air/Vacuum Valve, (with attachments) or approved equal.

The Contractor is cautioned to allow for an increase of bury on the force main at the location of the combination sewage air/vacuum valve installation to provide for the proper manhole cover at designed finish grade.

4. BACKFILL

- 4.1 General - Backfilling above the pipe envelope 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 or method may be used which will result in damage to or misalignment of the pipe.

- 4.2 Acceptable Backfill Material - Where crushed stone backfill is required, the crushed stone shall be No. 67 size as designated by Kentucky Transportation Cabinet Standards for crushed stone used in road surfacing.

Where crushed stone is not required, but the excavated material is unsuitable for use in the backfill, the Contractor may use fine, dry selected earth or clay as backfill material. Material containing excessive organic matter: stumps, roots, refuse or foreign matter or hard clay lumps that cannot readily be compacted will not be acceptable for use as backfill.

In highways, streets, drives, or other paved or traveled areas or within 3 feet of these areas and where called for on the Drawings, the Contractor shall backfill entire trench with crushed stone 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. Stone backfill in areas other than as described above, and where directed by the Engineer, shall be designated as crushed stone backfill.

Where the trench is located in open country or on public right-of-way more than 3 feet from the roadway or shoulder, the backfill up to a point 12 inches above the top of the pipe shall be placed as specified under "Pipe Bedding and Envelope". Above this point the backfill may consist of excavated material provided such material is selected to exclude rocks larger than 6 inches in any dimension. No rocks larger than 1-1/2 inches may be used in the top 6 inches in any dimension.

Sufficient care must be exercised to avoid leaving any holes or voids over, around, or under stones, boulders, or other backfill materials which may later be filled by leaching or settlement of surrounding material thereby causing future trench settlement.

The Contractor shall be responsible for and shall protect all sewers, storm sewers and electric, telephone, water or other pipes or conduits against danger or damage while the trenches are being backfilled and from future settlement of the backfill. Where such damage should occur as a result of the Contractor's operations, he shall repair such damage promptly to the Engineer's satisfaction.

The Contractor's attention is called to the fact that he will be held completely responsible for any damage to pavement, sidewalks, curbs, gutters, meter or valve boxes, street inlets, or other structure or appurtenances as a result of the Contractor's operations. It should be specifically noted that the Contractor shall be responsible for damage even though the character or nature of the original pavement or structure was such that it was not capable of carrying the load of the construction equipment regardless of the construction methods used.

4.3 Other Backfill - Backfill around manholes located in highways, streets, or other traveled areas shall consist of such material and shall be placed in such manner as described for adjacent trenches under "Backfill" above. Backfill around manholes, piers, or other structures in locations not subject to traffic may consist of excavated material subject to the following restrictions:

1. No rock larger than 6 inches in any dimension shall be placed within 6 inches of the manhole walls or pipes entering or leaving the manhole.
2. No rock larger than 6 inches in any dimension shall be placed in the vertical prism above and extending 9 inches outside of the pipe lines.
3. Crushed stone shall be used under, around, and up to a point 12 inches over the tops of any pipes entering or leaving the manholes. This requirement shall include the inlet pipe for drop manholes.
4. Excavated material used for backfill shall be carefully placed in layers not exceeding 9 inches and compacted in such manner as to fill all voids and prevent excessive settlement.

5. COMPLETING INSTALLATION OF LINES, STRUCTURES, ETC.

- 5.1 General - The Contractor shall not, without the permission of the Engineer, remove from the line 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 re-grass 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, side 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, placing of topsoil, 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 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.

Fertilizer shall be "Vertigreen," Virgaro," 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.

In existing garden areas disturbed by sewer construction, the Contractor shall place topsoil to a finished depth of 24 inches and fine rake the garden area. The topsoil may be obtained by stripping the garden area prior to construction and stockpiling the topsoil or bringing in additional topsoil. Seeding and mulching shall be omitted in garden areas.

- 5.3 Pavement Restoration - Before trenching in paved roadways for street crossings, the Contractor shall straight-line cut pavement on each side of trench. This is to be done to minimize damage to existing paving.

As soon as the pipe has been installed, the trench shall be backfilled as specified and, where directed by Engineer, a temporary pavement patch shall be provided in areas which have permanent paving. "Permanent paving" shall mean asphaltic concrete ("hot mix") or Portland cement concrete.

Cold mix, surface treatments, crushed stone are excluded from the "permanent pavement" classification. The temporary pavement patch shall consist of at least 6 inches of compacted stone base brought to within 2 inches of the surface of the existing permanent pavement. A 1-inch layer of cold mix asphaltic concrete shall then be applied to protect the base, prevent "pot holes" or "chuck holes," and provide a reasonably smooth pavement surface until the permanent patch is made. The temporary pavement patch shall be placed within 48 hours of receipt of written instruction of the Engineer.

Pavement types shall be designated by Engineer for installation in specific location where such designation is not shown on the Drawings. All street pavements, unless otherwise noted herein or directed by the Engineer, which have sewers installed parallel with the road, across streets, driveways or parking lots shall be restored by the following.

Prior to placement of the pavement restoration, the Contractor shall reshape the street or roadway surface. Street preparation shall include all required scarifying, shaping, and rolling in pug mix of areas to be paved. This item will also include the removal of all pavement which is heaved by the Contractor's blasting operations. This street preparation shall return the streets to the template which existed prior to construction. This street preparation shall be satisfactory to the Department of Public Works before the street is accepted for paving operations. No separate payment will be allowed for street preparation.

1. Asphalt Pavement or Driveway Replacement Type A or B

This item of pavement restoration shall conform to the details included in the Contract Drawings. The leveling binder course shall conform to Section 407 and the surface course shall conform to Section 411 of the Kentucky Department of Highways Standard Specifications.

2. Bituminous C. W. Leveling Course Binder - Type G

Place 2 inches of C. W. leveling course binder surface over the entire roadway surface. The surface shall be furnished and placed in accordance with the Kentucky Department of Highways, Standard Specification, Section 407.

3. 2 Inches of Leveling Course Binder in Trenches

Place 2 inches of leveling course binder in trenches. Furnish and place in accordance with Kentucky Transportation Cabinet Standard Specifications; shall conform to the details included in the Contract Drawings. This item is intended for use and placement prior to full width overlay with asphaltic surface course.

4. Asphalt Surface Course

Place 1-1/2-inch asphalt surface course over the entire roadway surface. Furnish and place in accordance with Kentucky Department of Highways Standard Specification, Section 411. Prior to placing the surface course, a tack coat shall be applied in accordance with the Standard Specifications.

The above asphalt pavement replacements will be measured for payment as indicated in the Unit Price Items. These payments shall also include full compensation for applying all necessary prime or tack coats required by the Tennessee Department of Highways Standard Specifications prior to the placement of base or surface courses.

5. Oil and Chip (Type) Pavement

Place Double Bituminous Surface Treatment (DBST) over 6-inch crushed stone base.

6. Asphalt Driveway and Parking Lot Replacement

Asphalt Driveways and Parking Lots shall be replaced equal to that existing prior to construction and shall consist of no less than 2 inches of surface course conforming to Section 411 of the Kentucky Department of Highways Standard Specifications.

7. Crushed Stone Roadway Replacement or Driveway Replacement

Crushed Stone Roadways and Pavements shall be replaced to that existing prior to construction but in no case less than 6 inches in depth.

8. Concrete Driveway Replacement

Concrete driveway shall be replaced equal to that existing prior to construction but in no case less than 6 inches in depth with 4-inch x 4-inch reinforcing wire mesh.

The above pavement replacements will be measured for payment on a linear foot basis unless otherwise indicated.

NOTE: Where full-width pavement replacement is installed, crushed stone shoulder may be required. Where required and authorized by the Owner or his authorized representative, the crushed stone shoulder shall consist of 2 inches (minimum) of pug mix or crusher run to stabilize edge of new street. This stone shoulder shall be 2 to 3 feet in width.

All gas valves, water valves, and manholes will be adjusted to the final surface elevations by the Contractor. Cost to be merged into price for pavement replacement.

- 5.4 Dust Control - From the time backfilling is complete until the time permanent pavement surface is replaced or, in the absence of pavement replacement, until job is accepted, Contractor shall, at direction of Engineer, water streets, roads, etc. to settle dust where excessive dust has, in the opinion of Engineer, been caused by Contractor's operations. If Contractor refuses or delays unnecessarily to obey direction of Engineer, the Water

Department shall, after 24 hours written notice through Engineer, be permitted to proceed with such work with cost to be billed to Contractor.

- 5.5 Sodding or Sprigging - Where shown on the Drawings or directed by Engineer, 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, stocks, etc. and smooth the surface. Area shall be fertilized by a suitable application of high-grade commercial fertilizer at a minimum rate of 500 pounds per acre. Fertilizer shall be mixed into the top 3 inches of soil by raking, discing, or other acceptable method. Do not over-fertilize 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 much 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 areas 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 as 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 General - The Contractor's attention is called to the special conditions indicated on the plans by notes and/or special details 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, and other utilities 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.

If these special construction items are to be paid for separately, they will be discussed in Measurement and Payment of the Specifications.

- 6.2 Construction Schedule - The Contractor shall submit his proposed construction schedule for the Engineer's approval before construction begins. The normal requirement will be to begin pipelaying at the lower end of any proposed line or Contract and continue laying upstream until the line is completed. Construction will begin at points where proposed sewers tie into existing sewers, existing or proposed pump stations, or existing or proposed treatment facilities.

The Contractor may utilize more than one pipelaying crew in which case the additional crew(s) will be started at various points along the sewer(s) as approved by the Engineer.

It is anticipated that adjacent projects to this project will be under construction simultaneously. It is the Contractor's responsibility to coordinate his work with that of other Contractors on this project.

The Contractor is cautioned that no new construction may be tied into the existing system until such construction is complete to the extent of being watertight and clean. This provision is meant to avoid groundwater or stormwater with accompanying dirt, gravel, etc. from entering the existing system and flooding, overloading, or otherwise damaging those facilities.

- 6.3 Protection of Trees and Shrubs - The Contractor shall make every reasonable effort to protect trees, shrubbery, and flowers within and outside of the work area. Easements have been (or will be) obtained by the Owner for work on private property and permits for work on public property, but these easements do not permit indiscriminate destruction of property including trees, shrubs, and flowers.

The Contractor will be required to protect and replace, if damaged, trees, shrubs, and flowers laying outside of a work area 10 feet wide centered on the pipeline or other work area designated on the Drawings. Such protection or replacement will be at no cost to the Owner.

Within the designated work area 10 feet wide centered on the pipeline or other work area designated on the Drawings, trees, shrubs, and flowers may be removed if necessary for proper execution of the work. Exceptions to this will be noted on the Drawings. Where replacement of damaged or destroyed trees, shrubs, or flowers is required which were not designated to be protected (by note on the Drawings), the Contractor shall perform the replacement and the Owner shall pay the costs in accordance with provisions of the General Conditions.

- 6.4 Concrete Work - Concrete is to be proportioned in two classes according to use as follows:

Class A for reinforced concrete structures, non-reinforced portions of manholes, control chambers and interceptor structures, curbs and gutters, driveways, sidewalks and surface base courses for highway and street paving.

Class C for encasement around sewers and water lines for cradle, caps, refill and tunnel backfill, and for thrust blocks.

Class A concrete is to be proportioned with one 94 lb. sack of Portland Cement, 195 lbs. of sand, and 270 lbs. of coarse aggregate. These proportions may be varied by the Engineer after the materials supplied have been tested and proportions for the greatest density and workability determined, provided that no more than 7.25, nor less than 5.5, bags of cement per cubic yard of concrete will be required. Class A concrete shall have a minimum compressive strength of 4,500 lbs. per square inch in 28 days.

6.5 Connection to Existing System - Connections of gravity-flow sewers and force mains to the existing system shall be made in the manner indicated on the Drawings. As previously stated, new lines must remain disconnected from the existing system by actual physical separation, by plugs of a type approved by the Engineer, or by other means approved by the Engineer.

6.6 Manhole - Where shown on the Drawings or where directed by the Engineer, the Contractor shall install vents at manholes to provide for ventilation of the sewer line.

Vents shall be installed in accordance with Standard Detail Drawings. Vent pipe shall be Schedule 40, steel, 4-inch, connected to the manhole as high as practicable while maintaining adequate cover on the vent pipe and vented above high water at the elevation shown on the Drawings or as directed by the Engineer.

Vent pipe shall have at least a 2-foot bury, be sloped to drain from the support pole to the manhole, and be connected through the manhole wall with a non-shrink grout. Vent pipe shall be painted with 2 coats of bitumastic paint as approved by Engineer.

Galvanized steel or rigid aluminum electrical conduit and fittings may be used in lieu of the Schedule 40 steel.

6.7 Manhole Stub-Outs - Where shown on the Drawings or as directed by the Engineer, the Contractor shall construct pipe stub-outs from the manholes for future line connections.

Stub-outs shall consist of a short length of sewer pipe 8 inches to 10 inches in length installed at an invert elevation and plan angle as shown on Drawings or as designed by the Engineer. The manhole invert shall be shaped to receive discharge from this line. The connection through the manhole wall shall be made with resilient connectors in accordance with the Standard Details for Manhole Construction. The pipe shall be plugged with a watertight, removable plug of a design and material approved by the Engineer. The area under the stub-out and to the level of pipe bedding shall be backfilled with crushed stone.

Stub-out pipe material and size shall be as designated on the Drawings or as directed by the Engineer.

6.8 Concrete and/or earthen Trench Dam - Where shown on the Drawings or as directed by the Engineer, the Contractor shall install concrete and/or earthen trench dams to prohibit the flow of water along the sewer trench. Concrete and/or earthen trench dams shall be installed in accordance with the Standard Detail Drawing.

6.9 Slope Protection and Erosion Control - This section shall consist of temporary control measures as shown in the Drawings or directed by the Engineer 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.

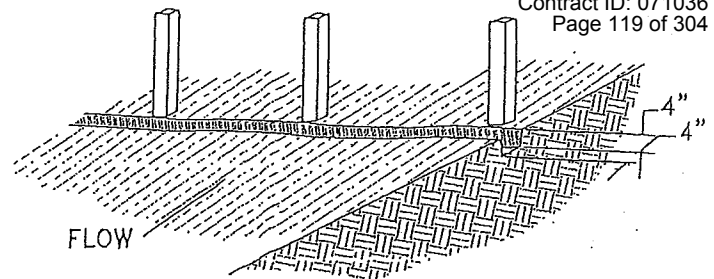
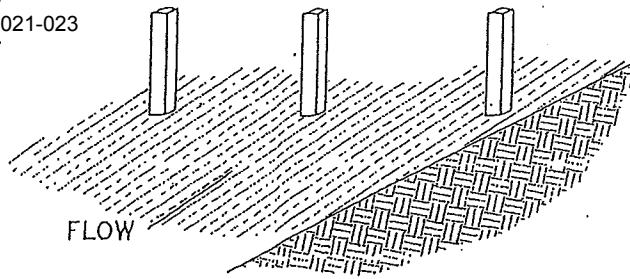
Baled hay or straw checks shall be used where the existing ground slopes in ditches or other areas where siltation erosion or water run-off is a problem.

- 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.

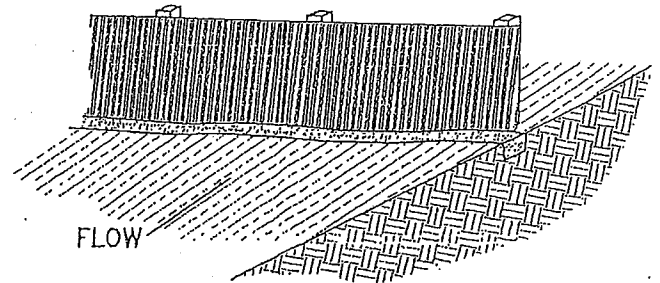
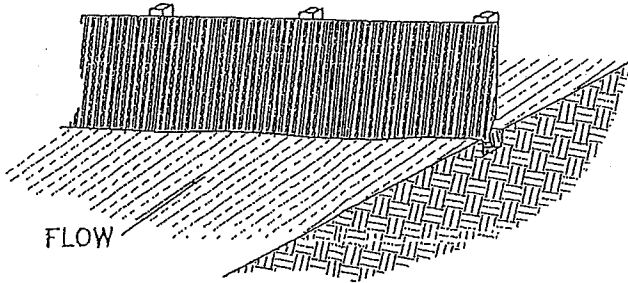
Where the work to be performed is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls and falls within the specifications for a work item that has a contract price, the units of work shall be paid for at the proper Contract price.

- 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.

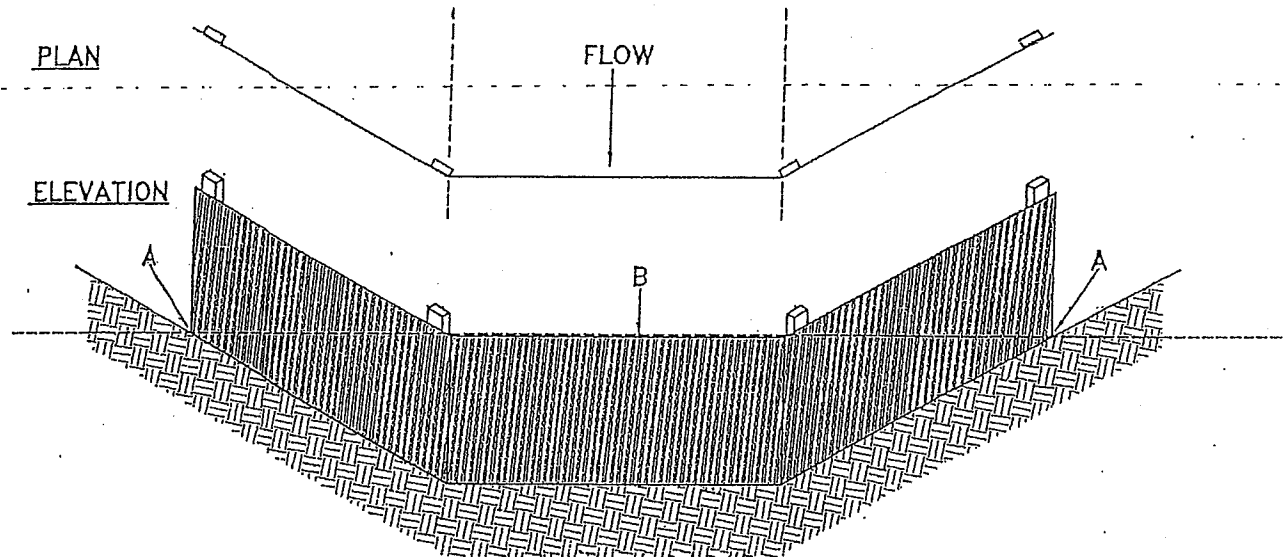


3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.

4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



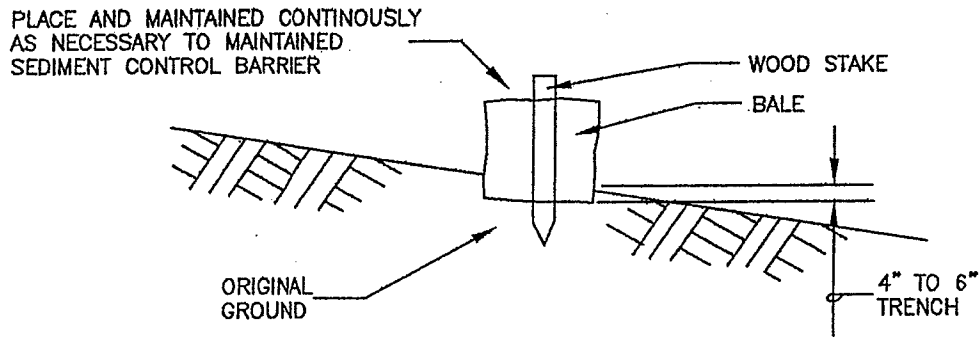
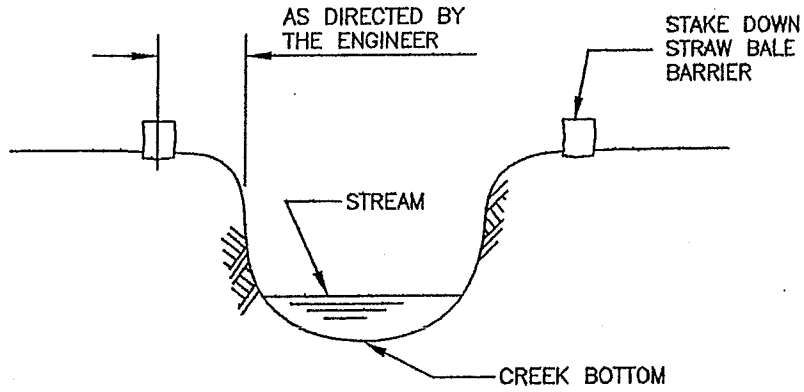
CONSTRUCTION OF A FILTER BARRIER



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

SEWERS, FORCE MAINS AND APPURTENANCES

SECTION 4

TESTING AND ACCEPTANCE

1. TESTING

Testing and inspection of the completed work shall be accomplished by one or more of the following methods. Visual Inspection, Air Pressure Testing, and Infiltration Test will always be done and will not be paid for as a separate pay item. The Roundness Test for flexible pipe will always be done and will not be paid for as a separate pay item.

Upon completion of construction, the Contractor shall remove all sand, dirt, brick and other foreign materials from the sewers and shall conduct his own inspection to locate any defects and determine when the sewers are ready for final inspection, testing, and acceptance by the Engineer. After all apparent defects have been corrected, the Contractor shall notify the Engineer and request a final inspection.

No final inspection will be scheduled by the Engineer until the Contractor advises that he has conducted his own inspection and believes the project to be ready for such final inspection. Should the Engineer begin a final inspection at the request of the Contractor and find that the sewers have not been cleaned or defects have not been corrected, the inspection will be terminated and will not be rescheduled until the Contractor again advises that the project is ready for inspection.

Acceptance of the project shall involve a visual inspection, a leakage test, and an air pressure test. The procedures shall be as outlined hereinafter. The work will not be accepted until the visual inspection, leakage test, and air test results are satisfactory.

- 1.1 Visual Inspection - Engineer shall make visual inspection of pipe, fittings, and other materials to be incorporated into the work before they are installed. Items found to be defective or otherwise not in accordance with Drawings and Specifications shall be immediately removed from the site of the work.

Visual inspection of pipe, joints, manholes, etc. will proceed as work is being done and no backfill shall be placed until this is accomplished unless otherwise approved by the Engineer. Acceptance of work at this stage in no way relieves Contractor of responsibility and does not preclude testing by any of the following methods at the discretion of the Engineer.

On completion of the work, all sewers and manholes will be inspected for foreign matter, including sand and mud brought in by infiltration or inflow, and any such matter shall be removed before final acceptance of lines. If visual inspection of lines, manholes, or other items reveals leaks, structural failures, or other defects, the Contractor shall repair such immediately. Any sags, humps, bends, or other evidence of misalignment - regardless of the type of pipe - if in the opinion of the Engineer is detrimental to the operation of the system, shall be cause for rejection. Inspection will include observation of clean-up, property restoration, pavement replacement, etc. Any defects must be corrected to the Engineer's satisfaction before acceptance.

1.2 Air Pressure Test - Equipment shall be top quality, in good condition, and approved by Engineer for use on this Project. Plugs should have a sealing length equal to or greater than the diameter of pipe being tested. External bracing of the plugs should not be required in order for the plug to hold against internal air pressure. The test equipment shall include accurate pressure gages to monitor test pressure, safety relief valve(s), and quick-release air bleed valve(s).

1. The procedure for air pressure testing shall conform to ASTM C-828 unless modified herein.
2. After backfilling and cleaning the line (including flushing, if necessary), making sure all service plugs are adequately braced against internal pipe pressure and checking air test equipment including pipe plugs (suitably graded against internal pipe pressure, if necessary), the sewer line section to be tested shall be pressurized to 4 psig (pounds per square inch-gauge) greater than the average back pressure of any groundwater that may be over the pipe (2.31 feet of water - 1 psig). At least 2 minutes shall be allowed for air pressure to stabilize. After the stabilization period and with 3.5 psig minimum pressure in pipeline, air supply shall be disconnected and the time observed which results in a 1 psig pressure drop.
3. The portion of line being tested shall be termed "Acceptable" if the time required for the pressure to drop from the stabilized 3.5 psig to 2.5 psig (greater than the average back pressure of any groundwater over pipe) is more than or equal to minimum calculated test time as determined by using the following table:

<u>PIPE DIA.</u> <u>inches</u>	<u>TIME</u> <u>minutes</u>	<u>LENGTH*</u> <u>feet</u>
8	4.2	350
10	4.7	275
12	5.7	225
15	7.0	175
18	8.5	150
21	9.9	125
24**	11.3	125

*Shorter or longer test length shall have test time modified in accordance with Engineer's decision

** Air test will not be run on pipe larger than 24 inches in diameter.

4. If the pipe is tested in a "dry" condition and fails to meet the test, specifications allow for the pipe to be wetted and tested in that condition. Initial testing may be in the "dry" or "wet" condition at the Contractor's option.
5. Observe safety precautions during test. Caution all workers to remain clear of test plugs which can blow out under considerable force at any time the line is pressurized.

- 1.3 **Roundness Test** - Sewers constructed of PVC pipe shall pass a go/no-go mandrel sized to 95% of the actual pipe diameter with the pipe in place and backfill completed. Contractor shall provide a suitable ball or mandrel having a diameter equal to 95% of the actual inside pipe diameter which he shall pull through each section of pipe while the Engineer observes the test. Any section of sewer showing a deflection of more than 5% of the actual inside diameter shall be considered to have failed and shall be re-laid to correct the condition.

Mandrel shall be pulled without mechanical pulling devices and shall not be performed until a minimum of 30 days after backfilling operations.

- 1.4 **Infiltration Test** - In addition to any other testing which may be required, any infiltration observed in any section of sewer shall be measured by using flow weirs. The weir test shall be made on the flow of water from sewers in not over 1,000-foot sections at any one time when, in Engineer's opinion, groundwater level is at highest point during a normal year. Contractor shall furnish all weirs, other materials, and labor required for such test. Weirs shall be in good condition and approved for the intended use by the Engineer. Engineer shall be responsible only for direction, reading, recording data, and calculating infiltration rates.

Maximum allowable infiltration shall be 25 gallons per mile per inch diameter per 24 hour period, but in no case shall exceed 1,500 gallons per mile of pipe per day for pipe 30 inches in diameter or larger. Joints shall be tight and leakage in excess of that specified herein shall be repaired.

The Infiltration Test shall not be relied on as the sole indicator of leakage if groundwater is determined to be less than 2 feet over the top of the pipe.

If the quantity of infiltration is in excess of the maximum quantity specified above, the joints shall be remade, the sewer re-laid, or other work performed by and at the expense of the Contractor in order to reduce the amount of leakage to an amount within the limits specified. The test will be repeated until the section of sewer passes the test requirements.

All visible leaks in pipes and manholes must be corrected regardless of the amount of infiltration.

- 1.5 **Exfiltration Test** - In case period of year of highest groundwater is not available before sewer is needed by the Owner, exfiltration testing may be used by the Contractor if approved by the Engineer.

Such testing shall be done between manhole segments by plugging the incoming lines on the downstream manhole and the upstream manhole. The method of filling the sewer with water shall be approved before use by the Engineer, and extreme care shall be used in conducting the test to avoid damage to the main sewer, service laterals, and service plugs. The line shall be filled slowly in such a manner to allow exhausting of air from the line as it fills. Suitable methods of measuring leakage rate shall be utilized as approved by the Engineer. Generally, exfiltration testing will not be used on line segments where the water elevation at the upstream manhole is more than 5 feet above the invert elevation at the downstream manhole so that pipe joints will not be subject to excessive internal pressures.

Maximum allowable exfiltration rate shall be 25 gallons per mile per inch diameter per 24-hour period, but in no case shall exfiltration exceed 1,500 gallons per mile per day for pipe 30 inches in diameter or larger.

If the quantity of exfiltration is in excess of the maximum quantity specified above, the joints shall be remade, the sewer re-laid, or other work performed by and at the expense of the Contractor in order to reduce the amount of leakage to an amount within the limits specified. The test will be repeated until the section of sewer passes the test requirements.

- 1.6 Vacuum Testing of Manholes - All manholes on this project will be required to pass a vacuum test of at least 10" Hg. prior to acceptance. This test shall be considered acceptable if the vacuum remains at 10" Hg. or drops to no less than 9" Hg. within one (1) minute. If the manhole fails the initial test, the Contractor shall locate the leak and make appropriate repairs acceptable to the Engineer in preparation for additional tests.

It is also called to the Contractor's attention that he will be required to furnish all equipment necessary for this test including the manhole sealing apparatus, gauges, pump, plugs, and operating personnel.

The cost of this work shall be merged into the unit price bid for manholes, and no additional payment will be allowed.

MANHOLE DEPTHDIAMETERTIME TO DROP 1" HG

10 ft. or less	4 ft.	75 seconds
10 ft. to 15 ft.	4 ft.	90 seconds
15 ft. to 25 ft.	4 ft.	105 seconds

For manholes 5 feet in diameter, add an additional 15 seconds; for manholes 6 feet in diameter, add an additional 30 seconds; and for manholes 7 feet in diameter, add an additional 45 seconds, to the time requirements for four foot diameter manholes.

- 1.7 Testing Force Mains - Before final acceptance, force mains shall be pressure tested by suitably closing the end of the main with a test plug of approved design suitably braced against the internal pressure to prevent blowout and possible injury to personnel. Contractor shall furnish all labor, materials, and equipment for testing the force main including, but not limited to, water for testing, test pump, pressure gauges, test plugs, etc. Test shall be performed by the Contractor and witnessed by the Engineer.

The force main shall be filled with water taking care to eliminate air from the high points. A positive displacement test pump shall be used to pump clean water into the main to build up a test pressure equal to the normal system pressure plus 50 psi. Test pressure will be determined by the Engineer. The test pump shall then be valved off from the system, and the pressure shall be observed over a period of one hour. A drop in pressure of 5 psi or more during the one-hour test period 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 one hour, 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 AWWA C600, latest revision. Leakage shall not exceed the quantity determined by the formula: $L = (ND P) \text{ divided by } 3,750$ where L is the allowable leakage in gallons per hour; N is the number of joints in the length of pipeline tests; D is the nominal pipe diameter in inches; and P is the average test pressure during the leakage test in pounds per square inch. 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 3/4 x 5/8-inch 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.

- 1.8 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 defects 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.

SEWERS, FORCE 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 incidental work such as clearing and grubbing, trenching, backfilling, testing, 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. SEWER PIPE

Service lines shall be measured for payment by horizontal measurements from the centerline of the main sewer to the plugged end of the service.

Sewer pipe and service lines shall be classified as under roadway if the sewer line is within 3 feet of the edge of the road. Any sewer or service line located more than 3 feet from the edge of the road shall be classified as outside roadway.

- A. Measurement - Sewer pipe shall be measured for payment by horizontal measurements or station distances along the centerline from center of manholes to the nearest 0.1 foot. Sewer size shall be based on nominal pipe diameter as shown on the Plans.

Measurement for establishing cut classification shall be the vertical distance from undisturbed ground elevation to the invert of the sewer as determined by the centerline cuts as determined by the Engineer. Where cut classification changes between adjacent stations and/or measured ground elevations, the ground slope shall be assumed to be uniform, and the distance to point of change in cut classification shall be calculated as proportional.

- B. Payment - Sewer pipe shall be paid for on the basis of the respective unit prices bid per linear foot for pipe of the various sizes, materials, and cut classifications.

Payment for furnishing and installing the sewer lines (gravity and force main) shall constitute compensation in full for furnishing all labor, tools, equipment and materials, and installing the sewer complete, including incidental work such as location and protection of existing utilities, clearing, excavation (including rock), dewatering trenches, bedding with crushed stone in accordance with Specifications, backfilling, 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, Paragraph 4.2.

3. MANHOLES AND DROP ASSEMBLIES

A. Measurement - Manhole bases shall be measured by actual count of the manholes of the various sizes installed. Manhole sidewall shall be measured vertically from the invert at the center of the manhole to the bottom of the casting or cover. Measurement shall be made to the nearest 0.1 foot. Measurement of the drop assemblies shall be the actual count of assemblies installed to the elevations shown on the Contract Drawings. Measurement of watertight and traffic-type manhole frames and covers shall be by actual count of such covers actually installed.

B. Payment - Payment for manhole bases shall be made on the basis of the unit prices bid per each (EA) for the various size manhole bases.

Payment for additional manhole sidewall shall be made on the basis of the unit prices bid per vertical foot installed above the standard 0'-6" depth. No separate payment shall be made for the first 6 feet of manhole sidewall.

Payment for drop inlet to manholes, where shown, shall be made on the basis of the unit price bid per each (EA) for each drop pipe and shall constitute payment in full for furnishing the drop tee, drop pipe, elbow, and encasement, and for constructing the drop inlet complete.

Payment for watertight manhole castings and traffic-type castings shall be made on the basis of the unit prices bid for each (EA) such casting installed.

Payment for manhole vent pipe assemblies shall be made on the basis of the unit price for each such vent pipe assembly installed.

NOTE: The Contractors attention is directed to the requirement for XYPEX® Concrete Admixture in all manholes constructed on this project.

4. SERVICE LINE

A. Measurement - Service line tees, lines, clean-outs, and connection items will be measured by an actual count of items installed according to various sizes and material classifications.

B. Payment - Payment for these various items and/or assemblies will be made in accordance with the unit price bid per each or per linear foot. Payment shall include the cost of all labor and materials necessary to construct these items in accordance to the details shown in the Construction Drawings.

5. ROADWAY MAINTENANCE, DRIVEWAY AND ROADWAY REPLACEMENT

1. ROADWAY MAINTENANCE

- A. Measurement - Roadway maintenance items shall be measured by the actual quantity used for the item as follows: bituminous "cold mix" per ton, water per 1,000 gallons, and calcium chloride per 100 pounds.
- B. Payment - Payment for roadway maintenance items shall be made in accordance with the unit prices bid for each item and shall include the cost of all labor and materials necessary for the application of these items.

2. DRIVEWAY REPLACEMENT

- A. Measurement - Measurement for asphalt driveway or parking lot replacement, gravel driveway, or concrete driveway replacement shall be made by the linear foot along the centerline of the sewer 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.

3. ROADWAY REPLACEMENT

- A. Measurement - Measurement for Type "A" asphalt pavement replacement shall be made by the linear foot along the centerline of the sewer for the actual quantity placed. Measurement for C.W. leveling course binder pavement replacement shall be made by the square yard for the actual amount placed over the full width of the existing roadway.

Note: A unit price item for asphaltic binder by the ton has been established to be used, if ordered by the Engineer.

- 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.

4. CRUSHED STONE SHOULDER

- A. Measurement - Measurement for crushed stone shoulder shall be made by the linear foot for actual quantity placed.
- B. Payment - Payment for crushed stone shoulder shall be made in accordance with the unit price bid per linear foot and shall include the cost of all labor, material, and equipment necessary to install the crushed stone shoulder.

6. 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 sewer.
- 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.

7. CONCRETE FOR CRADLE, CAP, CHECK DAMS, THRUST BLOCKING, AND/OR ENCASEMENT

- A. Measurement - Concrete used in cradling, encasement, or caps will be measured by computing the theoretical volume of concrete required to construct the item in accordance with Standard Detail Drawings. The length shall be the actual length of such concrete as installed at the Engineer's direction. Measurement for 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 plans 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 work. No separate payment will be made for Class C concrete included in manholes, drop pipes, service risers, or other structures where the price of such concrete is included in the unit price or lump sum price bid for the item.

8. FORCE MAIN PIPE

- A. Measurement - Force main pipe shall be measured for payment by horizontal measurement or station distances along the centerline of the force main beginning at the start of the unit price construction payment point and terminating at the discharge point of the force main. Force main pipe shall be classified as under roadway if the force main is within 3 feet of the edge of pavement. Any force main located more than 3 feet from the edge of pavement shall be classified as outside roadway.
- B. Payment - Force main pipe shall be paid for on the basis of the respective unit price bid per linear foot.

Payment for force mains and/or pressure sewers in tunnel/bore shall be from face of tunnel/bore to face of tunnel/bore and to the limits established in the Proposal Section.

Payment for furnishing and installing the force main shall constitute compensation in full for furnishing all pipe fittings, labor, tools, equipment and materials, and installing the sewer complete, including incidental work such as location and protection of existing utilities, clearing, excavation (including rock), dewatering trenches, bedding with crushed stone in accordance with Specifications, backfilling, disposal of surplus excavated material, the removal of existing pavements, testing, 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.

Concrete thrust blocks will be paid separately under the unit price item for Concrete for cradle, cap, and etc.

Note: No separate payment shall be made for detection tape. Cost shall be merged into the price per linear foot for 2-inch force main.

Backfill shall be in accordance with Section 3, Paragraph 4. Payment for force mains under roadway shall include crushed stone backfill.

9. FITTINGS

No separate payment shall be made for fittings for 2-inch diameter force main.

- 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 specially covered by other pay items.

10. AUTOMATIC AIR RELEASE VALVE ASSEMBLIES AND AUTOMATIC COMBINATION AIR AND VACUUM RELIEF MANHOLE ASSEMBLIES

- A. Measurement - The automatic air release valve assemblies and automatic combination air/vacuum relief manhole installation will be measured by actual count of each size and type valve installation installed in the complete system. See details on Contract Drawings.
- B. Payment - Payment for furnishing and installing the automatic air release valve assembly and automatic combination air/vacuum relief 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 installations as shown on the Drawings (including the valve(s) and connecting piping, manhole or valve box, cover, crushed stone, excavation, backfill, and incidental work necessary for a complete installation).

11. CRUSHED STONE BACKFILL FOR UNDERCUTS AND ROADWAY BASE (If Ordered)

- A. Measurement - In areas (other than areas specifically designated by these Specifications) where directed by the Engineer to backfill with crushed stone or to refill an undercut where the Engineer has directed that unsuitable material be removed, this item shall be measured for payment by the formula $(\frac{4}{3} \text{ O.D.} + 24)/12$ (length (ft)) (depth (ft)) divided by 27.
- B. Payment - Payment for crushed stone backfill 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 item will be used for placement of compacted additional roadway base stone, if ordered by the Engineer

12. UNCLASSIFIED EXCAVATION FOR UNDERCUTS AND REMOVAL OF UNSUITABLE ROADWAY BASE (If Ordered)

- A. Measurement - In areas where directed by the Engineer to remove unsuitable material below grade, this item shall be measured by the formula $(4/3 \text{ pipe O.D.} + 24)/12 \times \text{depth}$ divided by 27 for sewer mains and outside diameter plus 36 inches $\times \text{depth}$ 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.

Note: This item will be used for removal of unsuitable roadway base, if ordered by the Engineer.

13. 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 all labor and materials necessary to construct the item at the locations on the Contract Drawings or as directed by the Engineer.

14. MANHOLES, DROP PIPE ASSEMBLIES, SEALING AND PROTECTIVE COATING

- A. Measurement - Standard manhole of 0'-6' depth shall be measured by actual count of the manholes of the various sizes installed. Additional manhole sidewall shall be measured vertically for the vertical feet of sidewall above 6 foot. This measurement shall be from a point 6 feet above low pipe invert to the bottom of the casting or cover. Measurement shall be made to the nearest 0.1 foot. Measurement of the drop assemblies shall be the actual count of assemblies installed to the elevations shown on the Contract Drawings. Measurement of watertight and traffic type manhole frames and covers shall be by actual count of such covers actually installed.
- B. Payment - Payment for standard depth manholes (0'-6') shall be made on the basis of the unit prices bid per each (EA) for the various size manhole bases.

Payment for additional manhole sidewall shall be made on the basis of the unit prices bid per vertical foot installed above the standard 0'-6' depth. No separate payment shall be made for the first 6 feet of manhole sidewall.

Payment for drop inlet to manholes, where shown, shall be made on the basis of the unit price bid per each (EA) for each drop pipe and shall constitute payment in full for furnishing the drop tee, drop pipe, elbow, and encasement and for constructing the drop inlet complete.

Payment for watertight manhole castings and traffic-type castings shall be made on the basis of the unit prices bid for each (EA) such casting installed. Payment for watertight manhole inserts shall be made on the basis of the unit price bid for each (EA) installed.

Payment for manholes and relating items shall constitute compensation for all labor, material, equipment, excavation, removal and disposing of the existing

manhole, bypass pumping of sewage flow, and other work necessary to remove and replace the existing manholes.

Existing manhole sealing and protective coating shall be measured and paid on the basis of the respective unit price items established. Payment shall include all costs associated with provisions set forth in the previous sections for "Materials" and "Construction."

Filling of existing manholes which are to be abandoned in place shall be paid based on the unit price bid for each in accordance with the detail on the Contract Drawings.

Bulkheads of existing pipes shall be paid based on the unit price bid for each.

158. 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 H - WATER MAINS AND APPURTENANCES

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DIVISION H
WATER MAINS AND APPURTENANCES

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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 or structures as shown on the Contract Drawings shall be merged into the unit price per lineal 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 relaying 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 relaying.

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 Leitchfield Utilities Commission, Grayson County or Kentucky Transportation Cabinet 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 sewer installation, to regrade the street with pug mix to the template that existed prior to construction. This regrading shall be satisfactory to Leitchfield Utilities Commission, Grayson County or Kentucky Transportation Cabinet 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 sewer, 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 Plans 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 CLOSEOUT

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 67.

Crushed stone for backfill shall meet the quality requirements of ASTM D-692 and the grading requirements of AASHTO M-43, size 67.

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.

<u>Nominal Dia., In.</u>	<u>Minimum Wall Thickness, In.</u>	<u>Minimum Thickness Class</u>
4	0.29	52
6	0.31	52
8	0.33	52
10	0.35	52
12	0.34	51
16	0.37	51
18	0.38	51
20	0.39	51
24	0.41	51
30	0.43	51

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. 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.

<u>SDR</u>	<u>Pressure Rating</u>	<u>Minimum Bursting Pressure, psi</u>
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 brightly colored to contrast with soil 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.

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

6. POLYVINYL CHLORIDE (PVC) WATER MAIN

C-900 PVC water main pipe, where designated on the Contract Drawings and in the Bid Proposal shall conform to ANSI / AWWA C-900 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.

<u>SDR</u>	<u>Pressure Rating</u>	<u>Minimum Bursting Pressure, psi</u>
14	200	985

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
- SDR or class
- Manufacturer
- NSF Seal of Approval
- AWWA C-900

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

Pressure Class at 73.4° shall be 200 PSI (DR 14), (working pressure 200 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-900 water main pipe 4-inch through 12-inch shall be cast iron or ductile iron conforming to USA Std. A21.10 or compact ductile iron conforming to USA Std. A21.53-84, latest revision. Fittings shall have interior lining and exterior coating as specified for ductile iron pipe. Fittings for 12-inch and smaller pipe may be either cast iron or ductile iron.

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.

All fittings, valves and etc. shown on the drawings to be restrained shall be assembled to the ductile iron pipe by the use of pipe retainer glands similar to Series 100 EBAA iron or approved equal. This is in addition to or in lieu of standard concrete thrust blocking. The cost of providing and installing retainer glands on all fittings, valves, etc. shall be merged into established unit price items.

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 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 the 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 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 Project 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.

11. AIR RELEASE VALVE

Automatic air release valves shall be designed to allow a quantity of air to escape out of the orifice when air accumulates at high points in the water line. Valves shall be tested for service to pressures of 300 psi and can be made of cast iron housings. Valves shall be of similar construction to APCO 200A or approved equal. Inlet size shall be 1 inch in diameter.

12. 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).

13. 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.

14. 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 leakproof 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.

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
30	0.406	0.469
36	0.469	0.532
42	0.500	0.563

The casing pipe shall extend to the points indicated on the Drawings. The ends of the casing shall be protected against the entrance of foreign material but not tightly sealed, in a manner approved by the Engineer.

15. PIPELINE DETECTION TAPE AND TRACER WIRE

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 line below. Tape shall be placed approximately 2.0 feet above pipe line.

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-gauge insulated copper wire. All splices shall be by the solder or compression fitting methods. Wire nuts are not permitted.

16. SERVICE LINE ITEMS

Service lines shall consist of a corporation cock, bronze service clamp as per Contract Drawings, curb stop, meter box and meter as described herein or as shown on the Contract Drawings.

Bronze fittings shall be as follows:

Corporation cock - Ford F-1000 CTS/CC or approved equal.

Curb stop - Ball angle NO. 42-232W or approved equal.

17. SERVICE LINE ITEMS

Service lines shall consist of a corporation cock, line, curb stop, meter box and a meter herein described.

- a. Line Taps - Corporation cock, Mueller H-15008, or approved equal, size as designated on the Drawings or as directed by Engineer (3/4-inch, minimum).
- b. Service Line - Service line shall be copper conforming to ASTM B-88-62, Type K, with size as designated on the Drawings or as directed by Engineer (3/4-inch, minimum).
- c. Curb Stop - Mueller H-14340, or approved equal (size equal to service line size).
- d. Meter - *
- e. Meter Box - *

No separate pay item has been furnished for setting meter boxes. Where shown on the Drawings or as directed by the Engineer, the Contractor shall install meter boxes. Cost for this item shall be merged into the unit prices bid for service line.

* Furnished by Owner for this project.

18. WATER LINE / VALVE MARKERS

Where indicated on the Contract Drawings, markers for valves and/or water lines 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 and/or water 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.

19. FIRE HYDRANTS

Fire hydrants shall be iron bodies, 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.

20. 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.

21. CORPORATION STOPS

Where designated on the Drawings or required by the Engineer, corporation stops shall be Mueller H-1500 or approved equal with compression type connections for flared copper tubing.

22. COPPER PIPE

Small piping in the ground shall be of standard soft water pipe (tubing) for water service, ASTM B-88, Type "K" with bronze fittings, corporation stops and valves having compression type connections for flared copper pipe (tubing).

23. BUTTERFLY VALVES

All butterfly valves shall be of the tight closing, resilient seal type with seats that are securely fastened to the valve body of the valve disc. Valves shall be bubble-tight at rated pressure with flow in either direction and valve discs shall rotate 90 degrees from the full-open to the tight-shut position. Valves shall meet the latest requirements of AWWA Standard C504 for Class 150B and shall be Henry Pratt Company, Mueller, American or approved equals.

Valve manufacturer shall furnish certification that all valves furnished have been tested and manufactured in compliance with AWWA C504 in all respects.

Valves to be installed above ground or in vaults shall have flanged (ANSI B16.1) connections and buried valves shall have mechanical joint connections unless otherwise shown on the Drawings.

Valve bodies shall be constructed of cast iron ASTM A-126, Class C. Valve discs shall be constructed of either alloy cast iron ASTM A-436 (Ni-Resist) or Ductile Iron, Grade 65-45-12, ASTM A-536. Shafts of all valves shall be turned, ground, and polished. Valve shafts shall be constructed of 18-8, Type 304 stainless steel. Valve with seats in the valve body shall have seats that are simultaneously molded in, vulcanized and bonded to body. Valve seats on 24-inch valves and larger shall be retained in the valve body by mechanical means without metal retainers or other devices in the flow stream. Seats shall be of a synthetic rubber compound and shall be field adjustable and replaceable without dismantling operator, disc, or shaft. Valves with the seat on the disc shall be fitted with a resilient seat of natural rubber bonded to a stainless steel retainer ring and secured to the disc by stainless steel screws. The rubber disc seat shall be adjustable and replaceable in the field. Valve body seats shall be stainless steel. Valves shall be fitted with sleeve-type bearings. Bearings shall be corrosion resistant and self-lubricating.

Manual operators shall be of the traveling nut, self-locking type and shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Operators shall be equipped with mechanical stop-limiting devices to prevent over-travel of the disc in the open and closed positions. Valves shall close with a clockwise rotation. Operators shall be fully enclosed and designed to produce the specified torque with a maximum pull of 80 pounds on the handwheel or chainwheel. Operator components shall withstand an input of 450 ft. lbs. at extreme operator position without damage. Operators shall be equipped with a 2-inch square operating nut opening counterclockwise.

Manually operated valves above ground or in vaults shall be furnished with handwheels, unless chainwheel operators are required. Manually operated valves that are buried shall be equipped with valve boxes as listed in these Specifications and with extension stems, if required, to bring the operating nut to within 30 inches of the ground surface.

Extension shafts, brackets and other accessories required for installation of the valves as shown on the Drawings shall be furnished with the valves.

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 B 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 determined 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:

<u>Diameter</u>	<u>Joint Length</u>	<u>Deflection</u>
4" thru 12"	18 ft.	18 in.
14" thru 30"	18 ft.	10 in.

- 3.4 Polyvinyl Chloride Pipe (Class 200 PVC) - 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-C-600-87. 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 the Drawings or designated by Engineer and shall be installed in accordance with provisions of these Specifications dealing with laying of Ductile Iron Pipe. Joints shall be as designated under Section 2, Materials.

All fittings, valves, and etc., shall be assembled to the Ductile Iron Pipe by the use of pipe retainer glands similar or equal to Series 1200 EBAA iron, or approved equal. This is in addition to the standard concrete thrust blocking.

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.

All valves must be assembled to the Ductile Iron Pipe by the use of retainer glands.

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 the 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 retainer 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 the 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 the Drawings or elsewhere in these Specifications, Contractor may backfill with the excavated material provided material consists of loam, clay, sand, gravel, or other materials than, 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. 67 size as designated by the Kentucky Transportation Cabinet Standards for crushed stone used in road surfacing.

4.3 Backfilling Under Pipe - All trenches shall be backfilled by hand from bottom of trench to centerline of pipe. Approved backfill material (Crushed Stone No. 67) 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, 6-inch space below pipe shall be backfilled with approved bedding (Crushed Stone No. 67) material 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. 67) 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 8-10 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, Contractor shall, at direction of Engineer, water streets, roads, etc., to settle dust where excessive dust has, in opinion of Engineer, been caused by Contractor's operations. If Contractor refuses or delays unnecessarily to obey direction of Engineer, the Owner shall, after 24 hours written notice through Engineer, be permitted to proceed with such work with cost to be billed to 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, 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, rail roads, grass plots, yards, etc., and the whole work shall be left in tidy and acceptable condition. Contractor will be required to re-grass 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 nor farther behind pipe laying operations than 1000 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 Replacement - 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.

In roadway areas as soon as the pipe has been installed, the trench shall be backfilled as specified and, where directed by Engineer, a temporary pavement patch shall be provided in areas which have permanent paving. "Permanent paving" shall mean asphaltic concrete ("hot mix") or Portland cement concrete. Cold mix, surface treatments, crushed stone are excluded from the "permanent pavement" classification. The temporary pavement patch shall consist of at least 6" of compacted stone base brought to within 2 inches of the surface of the existing permanent pavement. A 1-inch layer of cold mix asphaltic concrete shall then be applied to protect the base, prevent "pot holes" or "chuck holes", and provide a reasonably smooth pavement surface until the permanent patch is made. The temporary pavement patch shall be placed within 48 hours of receipt of written instruction of the Engineer.

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 sewers installed parallel with the road, across streets, driveways or parking lots, shall be restored by the following:

Prior to placement of the pavement restoration, the Contractor shall reshape the street or roadway surface. Street preparation shall include all required scarifying, shaping, and rolling in pug mix of areas to be paved. This item will also include the removal of all pavement which is heaved by the Contractor's blasting operations. This street preparation shall return the streets to the template which existed prior to construction. This street preparation shall be satisfactory to the local street department or authority before the street is accepted for paving operations. No separate payment will be allowed for street preparation.

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.

In paved or improved roads, or where sidewalks, curbs, gutters or driveways have been damaged by Contractor, and where replacement of surfaces or damaged items is required, items shall be repaired or replaced without any needless delay and in the best workmanlike manner with same kind of materials as were removed or damaged in construction operation. Underlying foundation courses for roads, etc., finished surfaces, etc., shall conform to undisturbed item. Decision of Engineer shall be final as to classification of any form of pavement or surfacing not specified on Project Drawings or of any forms of pavement or surfacing where classification is at all doubtful. Should Contractor fail or refuse to repair any damage after receiving directions of Engineer, Owner may, after 24 hours written notice, employ such force and furnish such materials as may be necessary to do the work with cost to be billed to Contractor.

All gas valves, water valves, and manholes will be adjusted to the final surface elevations by the Contractor. Cost to be merged into price for pavement replacement.

1. Asphalt Pavement Replacement Type A

This item of pavement restoration shall conform to the details included in the Contract Drawings. The leveling binder course and the surface course shall be furnished and placed in accordance with the Kentucky Transportation Cabinet.

2. 4 Inches or 2 Inches of Leveling Course Binder in Trenches

Place 4 or 2 inches of leveling course binder in trenches. Furnish and place in accordance with the Kentucky Transportation Cabinet Standard Specifications, conforming to the details included in the Contract Drawings. This item is intended for use and placement prior to full width overlay with asphaltic surface course.

3. Asphalt Surface Course

Place 2 inch asphalt surface course over the trench cut patch pavement and place 1-1/2 inch asphalt surface course over parking lots, entire roadway or traffic lanes of streets. Furnish and place in accordance with Kentucky Transportation Cabinet Standard Specifications. Prior to placing the surface course, a tack coat shall be applied in accordance with the Standard Specifications.

The above asphalt pavement replacements will be measured for payment as indicated in the Unit Price Items. These payments shall also include full compensation for applying all necessary prime or tack coats required by the Kentucky Transportation Cabinet Standard Specifications prior to the placement of base or surface courses.

4. Asphalt Driveway and Parking Lot Patch Replacement

Asphalt Driveways and Parking Lots shall be replaced equal to that existing prior to construction and shall consist of no less than 2 inches of surface course conforming to the Kentucky Transportation Cabinet Standard Specifications.

5. Crushed Stone Roadway Replacement or Driveway Replacement

Crushed Stone Roadways and Pavement shall be replaced to that existing prior to construction but in no case less than 6 inches in depth.

6. Concrete Driveway or Ramp Replacement

Concrete driveway shall be replaced equal to that existing prior to construction but in no case less than 6 inches in depth with 4" x 4" reinforcing wire mesh.

The above pavement replacements will be measured for payment on linear foot basis unless otherwise indicated.

5.4 Dust Control - From time that backfilling is complete until time permanent pavement surface is replaced or, in absence of pavement replacement, until job is accepted, Contractor shall, at direction of Engineer, water or apply calcium chloride to streets, roads, etc. to settle dust where excessive dust has, in opinion of Engineer, been caused by Contractor's operations. If Contractor refuses or delays unnecessarily to obey direction of Engineer, the Owner shall, after 24 hours written notice through Engineer, be permitted to proceed with such work with cost to be billed to Contractor.

5.5 Sodding or Sprigging - Where shown on the Drawings or directed by Engineer, 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 Transportation Cabinet.

When working in or near lines of traffic, the Contractor shall provide warning signals or flagmen as required by the Kentucky Transportation Cabinet.

- 6.2 Water Main In Tunnel/Bore - The carrier pipe in the tunnel/bore shall be as specified in the Materials section of this specification. All work performed beneath existing structures, across railroad rights-of-way, and under pavements shall be performed in accordance with the requirements of the parties or agencies having jurisdiction over these locations. The Contractor shall contact the parties or agencies prior to starting work and shall meet all requirements of the parties or agencies in regard to methods of construction and the safety precautions to be taken in performing the tunnel work. All costs involved in meeting these requirements shall be paid for by the Contractor and no additional compensation allowed.

At the Contractor's option and with consent of the parties or agencies having jurisdiction, steel pipe may be jacked or bored into place in lieu of a liner plate tunnel provided the Contractor be responsible for all approvals from the parties and/or agencies having jurisdiction including, but not limited to, furnishing complete details of the methods to be employed for approval.

The water main pipe shall be adequately secured in the tunnel/bore casing by a method approved by the Engineer. At a minimum, the carrier pipe must be secured and new compressible sand or pea gravel shall be placed in the space between the liner/casing and the carrier pipe by a method approved by the Engineer. Concrete bulkheads will be placed at the end of the tunnel, thickness and placement of which shall be subject to the Engineer's approval. Excavation shall be unclassified and no distinction made between rock and other materials excavated, with the cost of excavation merged in the unit price per foot of pipe water.

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.

Construction of the tunnel/bore shall be carried on in such a manner that settlement of the ground surface above the tunnel/bore shall be held to an absolute minimum. Where ground conditions are unstable, poling plates or poling boards shall be used to prevent caving of material above the tunnel before the liner plates can be installed. Steel liner plates shall be installed as soon after the excavation is removed as possible and excavation shall not be removed more than 24 inches ahead of the installed liner plates.

Excavation shall be carried on in such a manner that voids behind the liner plates will be held to a minimum. However, should any boulders larger than 1 foot in diameter be encountered, they shall be removed so that none are closer than 6 inches to the outer face of the liner plates. Should piling be encountered, each pile shall be cut out so that no portion remaining shall be closer than 1 foot to the outer face of the liner. Where boulders or piling are excavated, the holes shall be backfilled by tamped material.

The steel lining shall consist of plates not to exceed 18 inches wide. Each circumferential ring shall be composed of the number and length of plates to complete the required diameter. The Contractor shall submit details of the lining for approval.

The strength of the casing or tunnel lining will be determined by its section modulus. Thickness of the metal for these steel plates shall not be less than 8 gauge allowing for standard mill tolerance.

All plates shall be punched for bolting on both longitudinal and circumferential seams and shall be so fabricated as to permit complete erection from the inside of the tunnel. The longitudinal seam shall be of the lap type with offset equal to gauge of metal for full width of plates including flanges and shall have staggered bolt construction so fabricated as to allow the cross-section of the plate to be continuous through the seam. All plates shall be of uniform fabrication and those intended for one size tunnel shall be interchangeable.

The material used for the construction of these plates shall be new and unused and suitable for the purpose intended. Workmanship shall be first-class in every respect.

After the plates are formed to shape and after all holes are punched, the plates shall be galvanized on all surfaces by the hot-dip process. A coating of prime western spelter, or equal, shall be applied at the rate of not less than three (3) ounces per foot of double exposed surface. If the average spelter coating as determined from the required samples is less than the amount specified above or, if any one specimen shows a

deficiency of 0.2 ounce, the lot shall be rejected. Spelter coating shall be of first-class commercial quality free from injurious defects such as blisters, flux and uncoated spots.

All nuts and bolts shall be galvanized.

Plates shall be fabricated with grout holes to facilitate grouting above and around the tunnel liner. These grout openings shall be 2-inch I.P.T. half couplings welded into a hole in the center corrugation couplings welded into a hole in the center corrugation of a plate and a galvanized C.I. plug shall be provided for each opening to permit tight closure after grout holes so that the spacing of 18 inch centers at the top of the tunnel and at the top quarter points, staggered with the holes at the top.

Field coating material shall be asphaltic mastic, Trumbull 5X, or approved equal, and shall be applied with hydraulic spray equipment using a minimum of 2,400 pounds pressure at the nozzle tip. The material shall be supplied at spraying consistency and shall be applied both the outside and inside of the liner plates. Plates may be hot-dipped to produce a similar coating.

When installing liner plate by the tunneling method, the excavation shall be performed in such a manner that voids between the undisturbed earth and the liner plate shall be maintained at a minimum. Any void occurring shall be filled with a Portland cement and sand grout pumped under pressure through grouting openings in the liner plate.

The minimum provision for grouting openings shall be one (1) opening in a top plate of the tunnel or conduit at locations not to exceed 54 inches apart. Additional plates with grouting openings are to be installed at the top quarter points on each side between the top openings. The opening shall be staggered but shall not exceed 54 inches in any one line. Grout vent pipes will be required at a minimum of one per monolithic pour.

The grout shall consist of Portland cement, water, sand and 2% approved additive (Bentorite, Septamine Seax, Hydrocide liquid, etc.). One part Portland cement with additive shall be combined to four parts clean sand and sufficient water added to provide a grout having the consistency of thick cream when well mixed.

A pump shall be provided for placing the grout which shall be capable of exerting sufficient pressure to assure the filling of all voids between the liner plate/casing and the undisturbed ground. Minimum acceptable pressure will be five (5) pounds per square inch.

Pumping of grout shall be done (1) at the completion of the installation of approximately each 9 feet of liner plate, (2) at more frequent intervals than 9 feet if conditions indicate the necessity, and (3) at the end of a work day or when there is work stoppage for any reason.

The carrier pipe shall be furnished by the Contractor. Upon acceptance of the liner/casing, install the carrier pipe in the casing by jacking it through the casing. A concrete invert may be poured if necessary to achieve proper line and grade on the carrier pipe to offset any minor variations in the alignment of the casing.

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 Contractors' unit price bid for water mains.

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 State of Kentucky - Water Pollution Control Division 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.

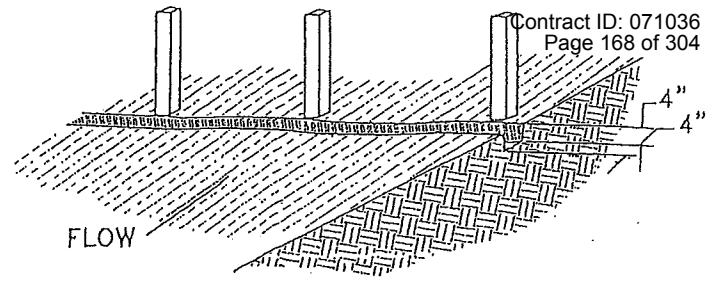
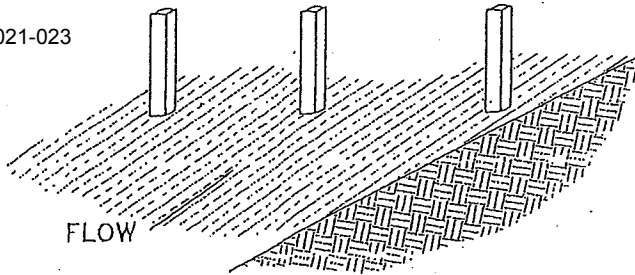
- a. Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing five (5) cubic feet or more of material.

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 based shall also be anchored securely to the ground by wooden stakes driven through the based 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.

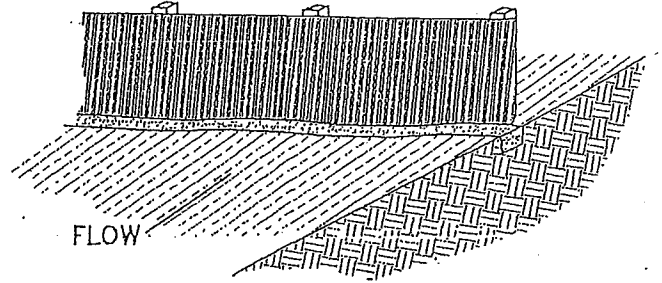
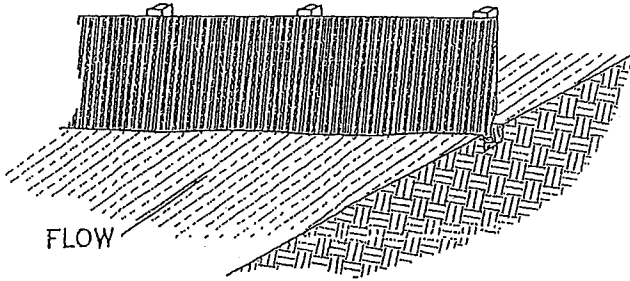
In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of work as scheduled, and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense.

- 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.

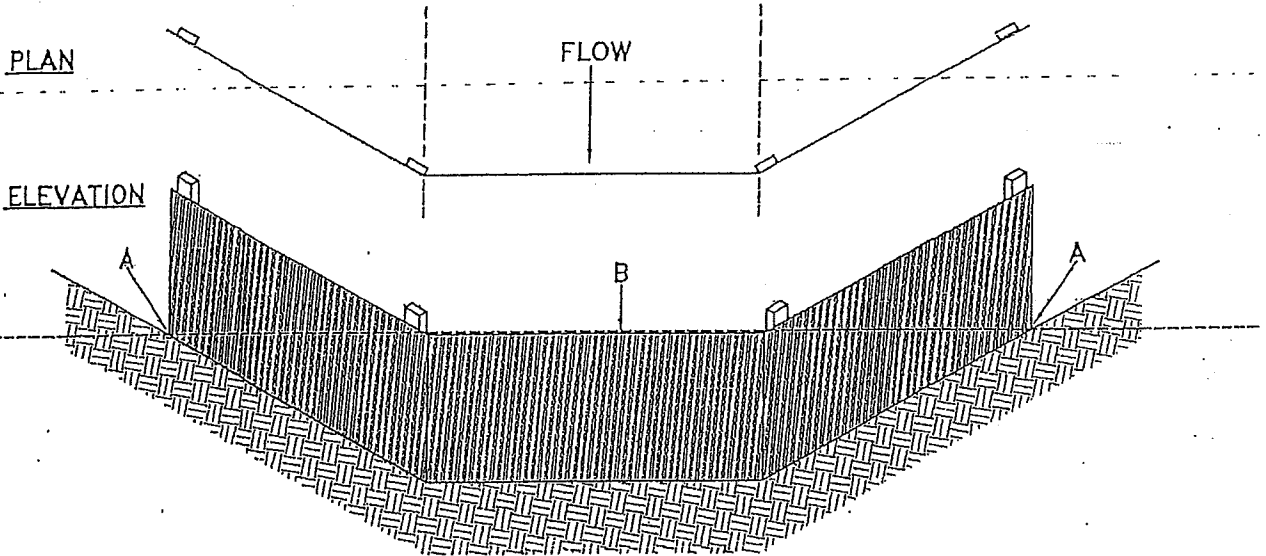


3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.

4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



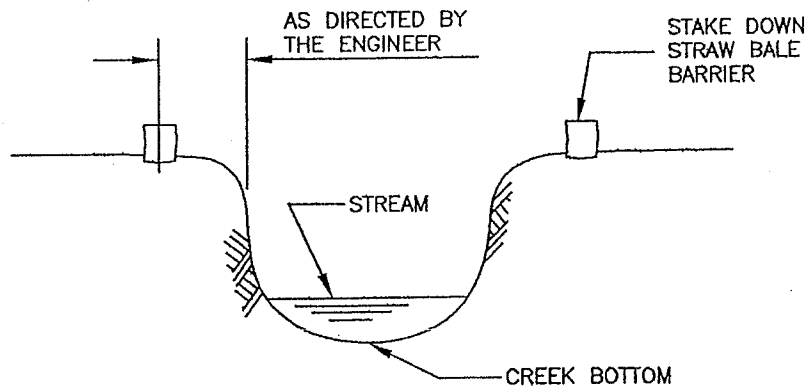
CONSTRUCTION OF A FILTER BARRIER



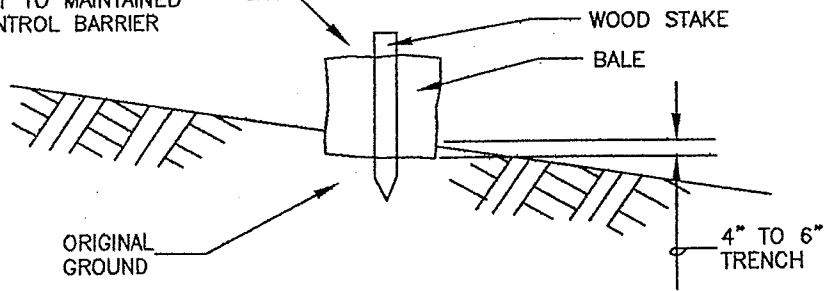
POINTS "A" SHOULD BE HIGHER THAN POINT "B".

PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

SILTATION FENCE



PLACE AND MAINTAINED CONTINUOUSLY
AS NECESSARY TO MAINTAINED
SEDIMENT CONTROL BARRIER



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 incomplete, 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 main extension 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. The test pump shall then be valved off from the system and the pressure shall be observed over a period of one hour. 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 one hour, 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 ANSI/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 litres/hour, multiply the values in the table by 3.785

Copied from ANSI/AWWA C600.

3. DISINFECTION

All water main extensions and appurtenances shall be disinfected upon completion, and after the system has been flushed to remove dirt or foreign objects which may have been accidentally introduced into the line, disinfection shall be accomplished by use of a main sterilizer or applying chlorine gas or a hypochlorinator for application of a hypochlorite solution.

The chlorine shall be introduced into the main as water is being added so that adequate mixing will occur. Chlorine shall be added until a concentration of not less than 50 parts per million of available chlorine is observed at check points throughout the section being disinfected. The chlorine solution shall be left in the mains for a period of 24 hours after which the mains shall be flushed until only the normal residual chlorine found in tap water is present. Samples of water shall then be taken by methods and personnel approved by the Engineer and the Owner and shall be submitted to the bacteriological laboratory of the State Division of Water or the Owner as the Owner may direct. In the event any of the bacteriological samples show the presence of coliform organisms or an excessive total count, the disinfection procedure shall be repeated until samples of satisfactory bacteriological quality can be obtained.

The Contractor shall furnish the chlorine for main disinfection and shall furnish all labor, tools and equipment for the disinfection and sampling, but the sample bottles will be furnished at no cost by the Water Utility.

Disinfection procedures shall generally be in accordance with the AWWA Standard for Disinfecting Water Mains, AWWA C601, latest revision.

Chlorine Required to Produce 50 mg/l
Concentration in 100 Feet of Pipe by Diameter

Pipe Size <u>in.</u>	100% Chlorine <u>Lb.</u>
4	0.027
6	0.061
8	0.109
10	0.170
12	0.245
16	0.435
18	0.551
20	0.681
24	0.98
30	1.53

4. TESTING OF VALVES

Upon completion of this project, the Contractor shall operate all buried valves in the presence of the Engineer to verify proper operation of each valve.

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 at the instant 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 Plans.
- 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 in accordance with Specifications, backfilling, 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 3.4. 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. 67) as per specifications.

Payment for water mains in tunnel/bore shall be on the basis of linear foot measured from face of tunnel/bore to face of tunnel/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.

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. 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).

6. FIRE HYDRANT RECONNECTION

- A. Measurement - Fire hydrant reconnection shall be measured by actual count of each reconnection in the completed system. The 6-inch gate valve and pipe shown in the standard detail will be measured and paid under a separate item in this Contract.
- B. Payment - Payment for reconnecting existing fire hydrants shall be based on the Contract unit price bid for each reconnection. The unit price bid shall include all labor, materials, including extensions and rodding or retainer glands as required, equipment necessary to disconnect the fire hydrant from the existing water line and reconnect to the proposed water line as shown on the Drawings, including excavation, stone, concrete backfill and other necessary work incidental for complete reconnection.

7. 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).

8. 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, 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 Plans and Specifications.

9. SERVICE LINE AND/OR RECONNECTION ITEMS

- 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.

10. TERMINAL BLOW-OFF ASSEMBLY

- A. Measurement - The terminal blow-off assembly will be measured by actual count each for each size and type installed.
- B. Payment - Payment for furnishing and installing the terminal blow-off assembly shall include any necessary joint accessories, adapters, valve boxes, and all other labor, materials and work to complete this item.

11. TIE-IN AND CONNECTION TO EXISTING WATER MAIN

- A. Measurement - The tie-in and connection to existing water mains will be measured by actual count of each size and type.
- B. Payment - Payment for tie-in and connection to existing water mains shall include schedule of shut-downs, excavation, materials (except fittings), tools, labor, equipment, cutting pipe, backfill, refilling water mains, and all other work not covered under subsequent unit price items.

12. CUT AND CAP OF EXISTING WATER LINES

- A. Measurement - The cut and cap of existing water lines will be measured by actual count of each size and type installed.
- B. Payment - Payment for cutting and capping of existing water lines 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 cut and cap installation as shown on the Drawings (including excavation, backfill, and incidental work necessary for complete installation).

13. ROADWAY MAINTENANCE, DRIVEWAY AND ROADWAY REPLACEMENT

1. ROADWAY MAINTENANCE

- A. Measurement - Roadway maintenance items shall be measured by the actual quantity used for the item as follows: bituminous "cold mix" per ton.
- B. Payment - Payment for roadway maintenance items shall be made in accordance with the unit price bid for each item and shall include the cost of all labor and materials necessary for the application of these items.

2. 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.

3. 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.

14. TOPSOILING AND SEEDING OF TRENCHES

- A. Measurement - Measurement for topsoiling 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.

15. 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 Plans 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.

16. 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 $(\frac{4}{3} \text{ pipe O.D.} + 24)/12 \times \text{length} \times \text{depth}$ divided by 27 for sewer mains and outside diameter plus 36 inches $\times \text{depth}$ 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.

17. 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 $(\frac{4}{3} \text{ O.D.} + 24/12)$ (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.

9. 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.

DIVISION I - GAS MAINS AND APPURTENANCES

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DIVISION I
GAS MAINS AND APPURTENANCES

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GAS MAINS AND APPURTENANCES

SECTION 1

GENERAL REQUIREMENTS

1. GENERAL

Scope of Work

The gas 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 gas 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

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 or structures as shown on the Contract Drawings shall be merged into the unit price per linear foot of gas 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, Gas, Telephone, Electric and Drain Facilities. In some instances, existing water, sewer, gas, telephone, electric 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. Furthermore, the Contractor will give adequate notice to the Utility to allow their location of lines ahead of the proposed construction with paint or stakes. The Contractor will be required to expose the lines prior to dynamiting and excavation where crossing pipeline installations.

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 Gas Facilities. Where existing gas mains are encountered in the work, they shall be maintained in operation to the extent that gas service is not interrupted.

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

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 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 the local Municipality, County, and/or State Highway Authority, as the case may be.

Where gas 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 gas main installation, to regrade the street with pug mix to the template that existed prior to construction. This regrading shall be satisfactory to the local Municipality, County and/or State Highway Authority 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 gas main for which there is no specific pay item(s) shall be considered as incidental to the construction of the proposed gas 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 gas 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 gas 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 water 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 gas main 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 drawings showing easements obtained for the construction of gas 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. SUBMITTALS

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

6. 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.

7. PROJECT CLOSEOUT

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 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.

GAS 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 1½-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 sizes.

3. BACKFILL MATERIAL

Sand for pipe bedding shall meet the quality requirement of **Section 903.06(b)** of the Standard Specifications of the Kentucky Transportation Cabinet.

Crushed stone for backfill in roadways and other designated locations shall meet the quality requirements of ASTM D-692 and the grading requirements of AASHTO M-43, size 67.

4. 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 blemishes or other defects. Defective castings which have been plugged or otherwise treated to remedy defects shall be rejected. Contact surfaces of frames and covers are to be machined so that the covers rest securely in the frames with no movement. The cover shall be in contact with the frames for the entire perimeter of the contact surface.

Valve box frames shall be supported by concrete blocks on each side of the valves with no weight of the valve box frame being on the gas main or gas valve.

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 "GAS."

5. PIPELINE DETECTION TAPE/MARKING TAPE AND TRACER WIRE

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 a minimum of 5.5 mils thickness, orange in color, and continuously printed in permanent ink to indicate caution for a buried gas line below. Detectable tape shall be placed atop all gas mains, including steel gas mains, and service lines installed under this project.

Detectable tape shall be 3 inches wide, with a minimum tensile strength of 5,000 psi, 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 brightly colored (Orange) to contrast with soil and shall bear the imprint "CAUTION -- GAS LINE BURIED BELOW." Tape shall be Terra-Tape as manufactured by Reef Industries, Inc. or approved equal.

Additionally, the Contractor shall provide and install a 14-gauge insulated copper wire on top of the newly installed PE gas main. (See Special Detail in Contract Drawings.)

6. 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 leakproof steel construction in accordance with the following table, unless specifically shown otherwise on the drawings or in the Specifications describing construction requirements or a particular casing location,

**TABLE OF MINIMUM WALL THICKNESS
FOR STEEL CASING PIPE
(COOPER E-80 LOADING)**

Casing, Diameter <u>inches</u>	Wall Thickness with approved protective <u>coating, inches</u>	Wall Thickness without approved protective <u>coating, inches</u>
Under 14	0.188	0.25

Casing Spacers/Insulators shall be equal to units manufactured by Advance Products and Systems, Inc., Lafayette, Louisiana, or approved equal. Spacers/Insulators shall be suitable for supporting the carrier pipe and shall provide a permanent insulation between the carrier pipe and casing pipe. The contractor shall submit method of installation for approval. End seals shall be pull-on rubber, seamless, with a minimum of 1/8-inch thickness and shall be Model AC as manufactured by Advance Products and Systems, Lafayette, Louisiana.

Note: Casing pipes are required only for bores with "P.E." polyethylene gas lines.

7. 2406 POLYETHYLENE (P.E.) GAS PIPE AND FITTINGS

Polyethylene (P.E.) pipe for gas main and fittings shall be manufactured in accordance with the latest edition/requirements of ASTM D-2513, ASTM D-2683, ASTM D-3251, the Plastics Pipe Institute and Section 192.59 of U.S. Department of Transportation Standards.

P.E. pipe and fittings shall meet or exceed the following:

<u>Property</u>	<u>Unit</u>	<u>Procedure</u>	<u>Requirements</u>
Material Designation	-	PPI/ASTM	P.E. 2406
Material Classification	-	D-1248	II C5 P34
Cell Classification	-	D-3350	345434C
Density (3)	gm/cm ³	D-1505	0.941
Melt Flow (4)	gm/10 min.	D-1238	0.2 Max
Flexural Modulus (5)	psi	D-790	125,000
Tensile Strength (4)	psi	D-638	2,800
ESCR (3)	Failure % Hrs.	D-1693	>F 5000
Elastic modulus	psi	D-638	110,000
Brittleness Temperature	F	D-746	-180
Vicat Softening Temperature	F	D-1525	235
Thermal Expansion	in/in F	D-696	8x10 ⁻⁵
Hardness	Shore D	D-2240	62
HDB @ 73.4	psi	D-2837	1,250

Pipe and fittings shall be manufactured from identical materials meeting the above requirements. In addition, the manufacturer's equipment and quality control facilities must be adequate to ensure that pipe and fittings are uniform in texture, dimensions and strength.

As part of the manufacturer bid submittal, the pipe manufacturer shall furnish a certificate stating that he is fully competent to manufacture P.E. pipe of uniform texture and strength and in full compliance with these Specifications, and that he has manufactured such pipe and fittings in sufficient quantities to be certain that all requirements of this Specification will be met and that pipe furnished for this project meets the requirements of these specifications.

Testing and inspection of all pipe shall be done at the factory with a certified copy of test results furnished to the Owner/Engineer prior to any pipe being installed. Tests shall be done in accordance with ASTM 2837 and validated in accordance with the latest revision of PPI TR-3. The owner may take random samples and have them tested by an independent laboratory. Samples that fail to comply with the requirements set forth in these Specifications shall be rejected.

Pipe and fittings shall be manufactured in accordance with ASTM F-714. Pipe and fittings, unless otherwise indicated on the Contract Drawings, shall be butt fusion type meeting the requirements of ASTM D-3261. All fittings shall be pressure rated to match the system piping and the outside diameter and minimum wall thickness shall meet the outside diameter and minimum wall thickness specifications of ASTM F-714.

The pipe manufacturer shall coordinate with the Owner/Contractor all points of connections including pipe to valves and other points of connection as may be required. The joining method shall be done in strict accordance with the pipe manufacturer's written instructions. The pipe manufacturer shall visit the site and instruct the Contractor's personnel in the proper method(s) of connections and shall provide a certification that the Contractor's personnel have been properly instructed.

The pipe manufacturer shall provide recommendations relative to the storage and handling of pipes and fittings. At a minimum, pipe and fittings shall be stored on clean, level ground to prevent damage. As a result of shipment, any section found to have cuts or gouges shall not be installed and such sections shall be removed from the project.

The polyethylene gas main and fittings shall not be less than SDR 11 and shall be pressure rated for a maximum available operation pressure (MAOP) of not less than 80 psi as determined by formulae contained in the American Gas Association Plastic Pipe Manual for gas service and in part 192 of Federal Regulations or the U.S. Department of Transportation. Furthermore, upon installation, the P.E. pipe shall be tested in accordance with section 192.513 of the Federal Regulations.

The polyethylene gas main and fittings shall be manufactured by either Phillips Driscopipe, Inc., Plexco, Polypipe, or approved equal.

8. GAS VALVES FOR POLYETHYLENE GAS MAIN

The gas valves for this project shall be quarter- turn, plug or ball shut off valves, and of the size indicated on the Drawings. The valves shall meet the minimum requirements of the U.S. Department of Transportation's Part 192 including Section 192.145(b) 1 and 2. In accordance with this Section, the service pressure rating of the valves shall be 100 psig when operating at maximum service temperature of 73 degrees F. The manufacturer shall submit documentation that the valves have been manufactured, tested and are in full compliance with the requirements of this Section.

In addition, the valves shall be manufactured in compliance with ASTM D-2513 and Shall be otherwise suitable for butt fusion to SDR 11-2406 polyethylene pipe.

Valves shall be manufactured by Nordstom (plug valves), Perfection (ball valve), or Frialen (ball valve) or approved equal.

9. STEEL GAS PIPE

Steel gas pipe shall be manufactured, tested and otherwise supplied in complete accordance with American Petroleum Institute Specification API-5L (latest edition). Unless otherwise noted, steel gas pipe shall be manufactured using X42 steel having a specified minimum yield strength of 42,000 psi. All line pipe shall be furnished in at least forty-foot (40') lengths, with ends beveled in accordance with 7.9.3 of API-5L. The steel gas pipe shall meet all applicable requirements of Part 192 of the U.S. Department of Transportation's (DOT) Pipeline Safety Regulations.

Pipe fittings shall meet the pressure requirements of the steel gas pipe to which the fittings shall be connected and shall fully meet the requirements of 192.149 of the DOT's Pipe Safety Regulations.

All steel gas pipe and fittings, where appropriate, shall be externally coated for external corrosion control. The coating shall be Scotch-Cote 206 thin film fusion bonded epoxy as manufactured by 3M Corporation. Coating thickness shall be a minimum of 12 mils thickness and a maximum of 15 mils unless double coating is required, in which case the minimum coating thickness shall be 25 mils. The coating must be applied on a properly prepared surface and have sufficient adhesion to the metal surface to effectively resist underfilm migration of moisture. The coating must be sufficiently ductile to resist cracking and have sufficient strength to resist damage due to handling and soil stress. All weld joints, service tees, and any attached appurtenances shall be coated with Polyken #1027 pipeline primer, or equivalent, and field wrapped with Polyken #932 joint wrap tape, or equivalent. All external protective coating must be inspected just prior to lowering the pipe into the ditch and backfilling, and any damage detrimental to effective corrosion control must be repaired. If coated pipe is installed by boring, driving, or other similar method, precautions must be taken to minimize damage to the coating during installation.

The steel gas pipe and fittings shall be domestically manufactured and no foreign manufactured pipe and fittings will be accepted.

10. GAS VALVES FOR STEEL GAS MAINS

The gas valves for steel gas mains for this project shall be quarter turn, standard weld end and/or flange end, full-port opening, ball shut-off valves. The valves shall meet the minimum requirements of the U.S. Department of Transportation's Part 192 including Section 192.145 and the minimum requirements of American Petroleum Institute (API) Specification 60 (latest edition). The gas valves shall be Class 300 having the maximum operating pressure rating set forth in Table 2.1 of API-60 for a temperature of 100°F or less.

All valves shall be equipped with wrench and extended operating stem sufficient to locate the operating with one foot of the grade surface, position indicator and valve box. The valve box shall be of a type and shall be installed to avoid transmitting any external loads to the gas main and valve. All valve castings shall be made accurately to the required dimensions and shall be sound, smooth, clean, and free from blisters and other defects. Contact surfaces of frames and covers shall be machined so that the covers rest securely in the frames with the cover in contact with the frames for the entire

perimeter of the contact surface. All castings shall be thoroughly cleaned subsequent to machining and before rusting begins, painted with a bituminous coating.

The manufacturer shall submit certification documentation that the valves have been manufactured, tested, and otherwise are in full compliance with requirements of the Federal Pipeline Safety Regulation, Part 192 and American Petroleum Institute Specification 60.

Valves for the gas main transmission pipe shall be manufactured by Grove or approved equal. Valves for side lines and blow-offs shall be manufactured by Ball-O-Max or approved equal. Main line valves in valve vaults shall have gear operations with 2-inch square operating nut.

11. CATHODIC TEST STATIONS

At locations shown on the Drawings or as directed by the Engineer, cathodic test stations shall be furnished and installed. Test stations shall be two wire, Cathod-O-Flex test station type as manufactured by Carsonite International, 1301 Hot Springs Road, Carson City, Nevada 89706 (800-648-7974) or approved equal.

12. VALVE MARKERS

Where indicated on the Contract Drawings or as directed by the Engineer, 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 Gas 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.

13. PLAIN STONE RIP-RAP

Plain stone rip-rap 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.

GAS 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 underground 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 gas mains 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. 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 gas 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. Unless otherwise noted on the Construction Drawings, trenching for installation of gas transmission and distribution piping shall be such that the pipe will have a minimum cover of forty-eight inches (48") in easements and rights-of-way and forty-eight inches (48") of cover under drainage ditches, creeks and streams. The bottom of trenches must be shaped so that full length of pipe is resting on trench bottom. Blocking shall not be used.

Note: In many cases the gas main shall be required to have more than 48 inches of cover to get under existing utilities or to satisfy other situations. This additional depth, when required, shall be merged into the unit price bid per foot of gas 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 and 911 agencies 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 and, at a minimum, twice the outside diameter of the pipe to be contained in the trench. 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 and to comply with federal and state safety regulations.

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 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 or other approved methods 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, he shall provide written instructions to the Contractor as to the procedure to be followed.

2.6 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.

2.7 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 determined 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.

2.8 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 therefrom. 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 GAS MAIN 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, the recommended practice of the pipe manufacturer, and the requirements of DOT Pipeline Safety Regulation. No person shall make a steel or polyethylene pipe joint unless that person has been qualified under the requirements of DOT Pipeline Safety Regulation, Subpart E 192.221 through 197.245 for steel pipe.

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, 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. 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.

Trench bottoms shall be carefully prepared. 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.

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 and groundwater 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.

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 Steel Pipe

3.3.1 Bending

Bending of the steel pipe shall be performed to conform to the shape of the trench. It is required to limit the number of bends to a minimum and still conform to the trench profile and alignment as well as maintaining required cover over the pipe. To conform to this requirement may require additional grading at crests of ridges, approaches to roads, water courses, other utilities, and other crossings. The Contractor shall eliminate unnecessary bending by varying the depth of the trench whenever practicable while still maintaining the required cover over the pipe.

The Contractor shall make all necessary field pipe bends required in the construction of the pipeline. Bends, such as $90^{\circ}\pm$ elbow, shall be minimum of 3 radii long sweep to accommodate future pigging of pipeline. Miter the ell as needed. The Contractor shall not be paid for any fittings including those shown on the Drawings.

All bending shall be done by the cold-strength method. Bends shall be made by using a type of bending machine approved by the Owner. Pipe with buckles, wrinkles, or flat spots will not be permitted in the pipeline.

The distance between center lines of bending points shall be one (1) pipe diameter. The maximum degree of bending at each bending point shall be one and one-half degrees ($1\text{-}1/2^{\circ}$). An accurate method of measurement shall be used. No bend shall be made nearer than four feet (4') to the end of the joint of pipe. When pipe is double jointed before bending, bend shall not be closer to the weld than three feet (3'). Departure from pipe roundness (the difference between the long and short diameters of the pipe) in any bend shall not exceed two and one-half percent ($2\text{-}1/2\%$) of the nominal diameter of the pipe. On pipe containing a longitudinal weld, the longitudinal weld must be as near as practicable to the neutral axis of the bend.

All pups five feet (5') and over shall be moved ahead daily and installed in line. There shall be a full joint of pipe installed between pups.

Any pipe that is buckled, wrinkled, flattened, or distorted shall be cut out and replaced at Contractor's expense.

3.3.2 Welding

All welding done under these Specifications shall be in accordance with minimum Federal Safety Standards (D.O.T.) Part 192, Subpart E, and with the Standard for Welding Pipe Lines and Related Facilities, API Standard 1104, latest edition.

All welding shall be done by the manual, electric shield-arc process unless written approval of an alternate method has been obtained from the Owner prior to commencement of the work. If alternate welding process is proposed by the Contractor, the Contractor shall submit a complete set of proposed welding specifications for review and approval by the Owner.

The Contractor shall, at all times, use only skilled workmen for welding. Each welder employed by the Contractor shall be required to satisfactorily pass a qualification test as outlined in Section 3 of API Standard 1104, latest edition. The Contractor shall, at its sole expense, prepare pipe specimens, furnish welding materials, beveling machine, coupon cutter, welding machine, and the testing of pipe specimen at an independent testing laboratory which shall be approved by the Owner. A representative of the Owner shall witness all test welding. Should any welder perform work that is not satisfactory to the Owner, such workman shall be immediately released or assigned other non-welding duties by the Contractor.

Line-up clamps will be used whenever practical. Internal line-up clamps will not be removed until the root bead (stringer) is one hundred percent (100%) completed. If an external line-up clamp is used, as much as possible of the root bead shall be completed and uniformly spaced around the circumference of the pipe and shall have an accumulative length of not less than fifty percent (50%) of the circumference before the clamp may be removed.

The adjoining lengths of pipe shall be accurately aligned so that all welding shall be at right angles to the axis of the pipe and accurately spaced before applying the stringer bead. Pipe shall be supported so that there is no strain on the stringer bead and so the pipe will be supported until the weld is complete and has cooled.

Before placing a joint of pipe in alignment, all dirt, mill scale and foreign materials shall be removed from the inside of the pipe by swabbing.

Preparatory to aligning pipe, all paint, rust, scale, dirt or other foreign materials that might affect the welding operation shall be removed by machine buffing and the entire circumference of the pipe joint. Contractor shall re-cut, trim or re-bevel all pipe ends as may be necessary to maintain correct alignment and spacing of the pipe using an approved type beveling machine.

The welding operation shall be protected from weather conditions that would impair the quality of the completed weld.

Welding shall be done by the shielded metal arc process and shall be performed in the vertical down direction. The current used for depositing the filler metal shall be direct reverse polarity. The pipe material shall be on the negative side of the line. The stringer bead shall be deposited using a drag technique so as to completely fuse the abutting edges of the lands and beveled parts of the joint. There shall be complete penetration with a minimum inside buildup. Stringer bead shall be made with 1/8-inch or 5/32-inch AWS Class E-6010 (Fleetweld 5, 5P or equivalent). The stringer bead shall be thoroughly cleaned before starting the Hot Pass. Power brushing may be sufficient, however, disc grinding may be required. The Hot Pass shall be started immediately after completion and cleaning of the stringer bead before the stringer bead can cool--always within five minutes. The 5/32-inch Hot Pass shall be made with AWS Class E-6010 (Fleetweld 5, 5P or equivalent) or AWS Class 7010 (Shield-Arc 85 or equivalent). The Hot Pass shall be cleaned by power brushing or disc grinding. Stripper passes may be used if required. The cover Pass shall be made using 5/32-inch AWS Class E-6010 (Fleetweld 5, 5P or equivalent) or AWS Class E-7010 (Shield-Arc 85 or equivalent) using a weaving motion and should be 1/32-inch to 1/16-inch higher than the pipe wall and overlay the groove by 1/16-inch on each

side. The completed weld shall be thoroughly brushed and cleaned. At the completion of the day's work, all welds that have been started shall be finished.

If more than one welder is used, then all welds shall be stenciled on top quarter of pipe by the Contractor according to numbers assigned to the welders by the Contractor. The Contractor shall furnish the Owner with a record of all numbers assigned. No numbers shall be reassigned. Metallic dies shall not be used to mark the pipe.

The Owner shall be privileged to have the Contractor cut out any questionable weld, and the Owner reserves the right to have any and all welds checked by x-ray or other non-destructive tests. The cost of such non-destructive testing shall be paid by the Owner unless the weld is found to be defective, in which case the Contractor shall be responsible and shall pay the cost of such testing. The Contractor will also allow time to conduct tests prior to coating. The Contractor shall repair or replace any unsatisfactory weld at his own expense.

The intent and purpose of these Specifications is to ensure a one hundred percent (100%) weld strength, ductility, fusion and penetration. Each completed weld shall be free of scale, oxides, gas pockets, air pockets, pin holes, non-metallic inclusions, rivers, undercutting, dirt, slag, or other foreign inclusions or any other defects.

Arc burns outside the area of the finished weld shall be cause for the rejection of the weld. Weld splatter from the welding process shall not be considered an arc burn. Cracked welds shall be rejected. Pin holes, cold laps, rivers, undercutting or any defects whatsoever occurring in any weld shall be repaired or cut out and completely re-welded at no expense to the Owner.

If a weld is repairable, the defective area will be completely removed and the area preheated before re-welding. If a defect is then observed in the repaired area, the entire weld shall be cut out and replaced. Replacement shall be made by welding into the line a pup joint having a minimum length of five feet (5'). Replacement shall be at the expense of the Contractor.

At the end of each day's work or at the end of sections of pipe not tied in, pipe shall be suitably capped in order to keep out foreign matter and shall remain capped until work is resumed or pipe sections are tied in.

3.3.3 Field Coating

All bare steel shall be free of dust, grease, oil, and other foreign matter. Particle removal can be accomplished by either power wire brushing or hand wire brushing. Remove grease and oil by use of a solvent that shall leave no oily or dusty film on the steel surface. All moisture must be removed prior to priming and taping.

Overlap onto factory epoxy coating shall be roughened to provide better adherence. This shall be done with a hand wire brush or 60 grit (or coarser) emery cloth.

Welds shall be cleaned of all welding slag, splatter, scale, sharp edges or burrs; these shall be removed by grinding or filing. Welds shall be no more than warm to the touch prior to priming and taping.

Tapecoat cold primer shall be applied sparingly after proper surface preparation. It shall be applied in a uniform continuous method to the steel surface and at least 4 inches onto the factory coating for at least 1 mil thickness. Apply by either brush or roller. Allow primer to dry to a tacky consistency before applying wrapping tape.

Prime only that amount of pipe that can be wrapped during the same workday; otherwise, the steel must be reprimed. Do not reprime until all dust, dirt and foreign matter has been removed.

Apply tapecoat H30 or polyken wrapping tape after proper surface preparation and priming by removing the release liner and spirally wrapping with a minimum 1/2-inch overlap.

Taping shall start and stop at least 4 inches onto the factory coating. Care shall be taken that the tape conforms to the cutback of the factory coating and the weld area. No voids or wrinkles shall be allowed.

3.3.4 Holiday Detection

Prior to installation of the pipe and subsequent to the installation of external coating, the entire pipe surface shall be tested for weak or defective coating. Two sweeps of the brush electrode may be required. Voltage setting shall be approximately 150 volts per mil thickness but holiday detection shall be field adjusted for proper detection.

3.3.5 Holiday Repairs

Hot melt patch compounds shall be used for holiday repair on fusion bonded epoxy pipe coating. The area around the holiday must be clean and dry. All dust, dirt, scale, and charred or disbonded coating shall be removed. Feather all sharp points, burrs, or rough edges by the use of a draw knife. The adjacent area should be roughened by a wire brush or 60 grit emery cloth to provide better bonding. Heat the area to be repaired to approximately 350 degrees with a non-contaminating heat source. While continuing to heat the cleaned and preheated area, apply the patch compound by rubbing the stick on the area to be repaired. A circular motion shall be used to achieve a smooth, neat patch having a thickness of no less than 15 mils. Do not burn the coating. Do not melt the patch stick directly with a heat source and allow to drip onto the holiday. The patched area must cool before handling.

3.3.6 Pipe Laying

The Contractor shall lay all pipe so that it conforms with the contour of the ditch. Overbends shall be made in such a manner that the middle of the bend shall clear the high point of the bottom of the ditch. Sag bends shall fit the bottom of the ditch. Side bends shall conform to the outside of the ditch. There shall be no points in the ditch where it is necessary to scrub or force the pipe into the ditch to obtain proper depth or lineup. Pipe shall fit the ditch without the use of external force to hold it in place until the backfill is completed.

Coated pipe shall be handled at all times with equipment designed to prevent damage to the coating. Chain or cable slings or other pipe handling equipment found to be injurious to the coating are not to be used. Contractor shall repair any coating damaged in the handling, lowering or removing of the pipe in the ditch so as to leave it in a condition equal to that of the undamaged coating. In lowering coated pipe in rock areas, 4-inch compacted dirt cushion, limestone dust, or sand shall be placed in the bottom of the ditch and the ditch shall be thoroughly padded above the pipe with 8 inches of compacted dirt, limestone dust, or sand to protect coating.

The pipeline must be installed with at least 12 inches of clearance from any other underground structure not associated with the pipeline. If this clearance cannot be attained, approval must be obtained from Engineer representative before installing the pipeline with less clearance. The pipeline must be protected from damage that might result from the proximity of the other structure.

Valves installed by Contractor shall be of the weld-end variety, unless otherwise noted on Contract Drawings, with proper blocking under the valve to prevent settlement.

Test wires shall be installed as required at no cost to the Owner. Contractor will furnish materials. Coating shall be repaired. All costs associated with these test wires, test stations shall be merged into the unit price bid for gas mains.

Contractor shall install the pipeline at all highway, street, and railroad crossings in strict accordance with the specifications required by state highway engineers, city engineers, railroad companies, or any other authority having proper jurisdiction over such installations after the Owner shall have first secured necessary permits for said work.

The pipe at all road crossings shall be buried to a depth to ensure that the top of the pipe or casing shall be at least forty-eight inches (48") below the lowest point in the bottom of the drainage ditch.

Note: For installation of PE gas main materials, the Contractor shall provide and install 3-inch detection tape along with 14-gauge trace wire as per specifications. This detection tape and trace wire shall be placed over the newly installed gas main as shown on the Standard Details included in the Contract Drawings.

3.4 Installation of Fittings

Fittings shall be placed in locations indicated on Drawings or designated by Engineer and shall be installed in accordance with provisions of these Specifications. 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.

3.5 Installation of Valves, Valve Vaults, and Valve Boxes

Valves and valve boxes and/or valve vaults shall be placed in the locations indicated on the Drawings or at locations designated by the Engineer. All valves and valve boxes 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.

All valves must be assembled to the gas main in strict accordance with the requirements and recommendations of the valve manufacturer.

Over each valve, except valve installations with a valve vault, 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.

The valve box shall not come in contact with valve, valve stem, extension, operating nut or gas main 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.

For all steel valve installations on this project, the Contractor shall place 4"x4"x16" solid concrete blocks under steel valves for support.

All valve boxes shall be supported by blocks to assure no weight is exerted onto the new gas mains.

Upon completion of project, the Contractor shall operate all buried valves in the presence of the Engineer to verify proper operation.

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 12 inches of finished grade in unpaved areas, backfill may contain stones up to 6 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 Contract 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. 67** size as designated by the Kentucky Transportation Cabinet Standards for crushed stone used in road surfacing.

4.3 Backfilling Under Pipe

All trenches shall be backfilled by hand from bottom of trench to centerline of pipe. Approved backfill material 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, 6-inch space below pipe shall be backfilled with approved bedding material 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, backfill above the compacted pipe backfill zone (12 inches above pipe) shall be crushed stone (No. 67) or other approved backfill material 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 to 10 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 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.

4.7 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. The Contractor will be required to re-grass lawns or neutral grounds where trenches are excavated in these locations or where the 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 pipeline 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 one day after pipe laying and backfilling or nor 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, hand raking 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 Replacement

In roadway areas, as soon as the pipe has been installed, the trench shall be backfilled as specified and, where directed by Engineer, a temporary pavement patch shall be provided in areas which have permanent paving. "Permanent paving" shall mean asphaltic concrete ("hot mix") or Portland cement concrete. Cold mix, surface treatments, crushed stone are excluded from the "permanent pavement" classification. The temporary pavement patch shall consist of at least 6 inches of compacted stone base brought to within 2 inches of the surface of the existing permanent pavement. A 1-inch layer of cold mix asphaltic concrete shall then be applied to protect the base, prevent "pot holes" or "chuck holes," and provide a reasonably smooth pavement surface until the permanent patch is made. The temporary pavement patch shall be placed within 48 hours of receipt of written instruction of the Engineer.

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 pipes installed parallel with the road, across streets, driveways or parking lots, shall be restored by the following:

Prior to placement of the pavement restoration, the Contractor shall reshape the street or roadway surface. Street preparation shall include all required scarifying, shaping, and rolling in pug mix of areas to be paved. This item will also include the removal of all pavement which is heaved by the Contractor's blasting operations. This street preparation shall return the streets to the template which existed prior to construction. This street preparation shall be satisfactory to the local street department or authority before the street is accepted for paving operations. No separate payment will be allowed for street preparation.

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.

In paved or improved roads, or where sidewalks, curbs, gutters or driveways have been damaged by the Contractor and where replacement of surfaces or damaged items is required, items shall be repaired or replaced without any needless delay and in the best workmanlike manner with same kind of materials as were removed or damaged in construction operation. Underlying foundation courses for roads, etc., finished surfaces, etc. shall conform to undisturbed item.

Decision of the Engineer shall be final as to classification of any form of pavement or surfacing not specified on Construction Drawings or of any forms of pavement or surfacing where classification is at all doubtful. Should the Contractor fail or refuse to repair any damage after receiving directions of the Engineer, the Owner may, after 24 hours written notice, employ such force and furnish such materials as may be necessary to do the work with cost to be billed to the Contractor.

All gas valves, water valves, and manholes will be adjusted to the final surface elevations by the Contractor.

Cost to be merged into price for pavement replacement.

1. Asphalt Pavement Replacement Type A

This item of pavement restoration shall conform to the details included in the Contract Drawings. The leveling binder course and the surface course shall be furnished and placed in accordance with the Kentucky Transportation Cabinet Standard Specifications.

2. Asphalt Driveway and Parking Lot Patch Replacement

Asphalt Driveways and Parking Lots shall be replaced equal to that existing prior to construction and shall consist of no less than 2 inches of surface course conforming to the Kentucky Transportation Cabinet Standard Specifications.

3. Crushed Stone Roadway Replacement or Driveway Replacement

Crushed Stone Roadways and Pavement shall be replaced to that existing prior to construction but in no case less than 6 inches in depth.

4. Concrete Driveway or Ramp Replacement

Concrete driveway shall be replaced equal to that existing prior to construction but in no case less than 6 inches in depth with 4"x4" reinforcing wire mesh.

The above pavement replacements will be measured for payment on linear foot basis unless otherwise indicated.

5.4 Dust Control

From time that backfilling is complete until time permanent pavement surface is replaced or, in absence of pavement replacement, until job is accepted, Contractor shall, at the direction of the Engineer, water or apply calcium chloride to 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.

5.5 Sodding or Sprigging

Where shown on the Drawings or directed by the Engineer, 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, discing, 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). 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 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 Transportation Cabinet.

When working in or near lines of traffic, the Contractor shall provide warning signals or flagmen as required by the Kentucky Transportation Cabinet.

6.2 Gas Main in Bore

The gas pipe in the bore shall be as specified in the Materials section of this Specification. All work performed beneath existing structures, across railroad rights-of-way, and under pavements shall be performed in accordance with the requirements of the parties or agencies having jurisdiction over these locations. The Contractor shall

contact the parties or agencies prior to starting work and shall meet all requirements of the parties or agencies in regard to methods of construction and the safety precautions to be taken in performing the bore work. All costs involved in meeting these requirements shall be paid for by the Contractor and no additional compensation allowed.

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 State of Kentucky Department of Environment and Conservation 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 based shall also be anchored securely to the ground by wooden stakes driven through the based 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.

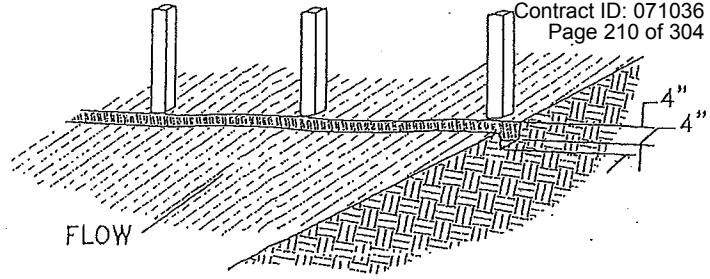
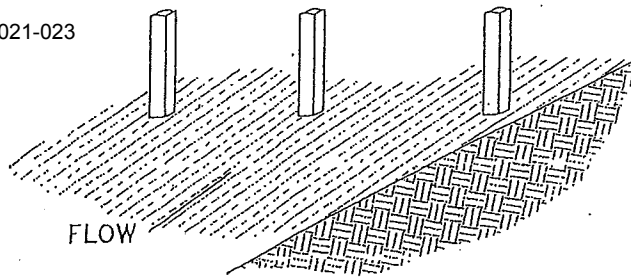
- c. Temporary silt fences - Silt fences utilizing posts, filter cloth (burlap or plastic filter fabric, etc.) or other approved materials are temporary measures for erosion control. These fences shall be installed to retain suspended silt particles in the run-off water.

- 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.

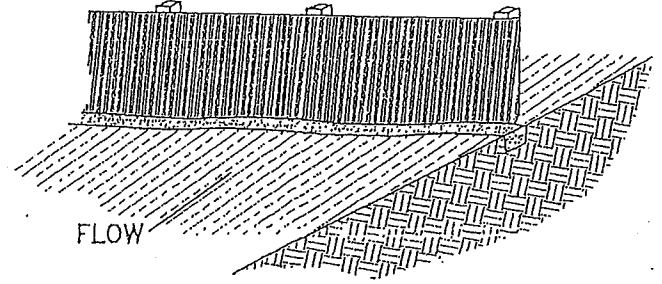
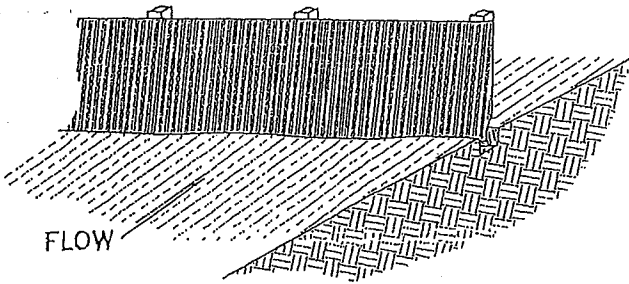
- e. Erosion control outside project area - Temporary pollution control shall include construction work outside the project area where such work is necessary as a result of construction such as borrow pit operations, haul roads and equipment storage sites. Bid price in such cases shall include all necessary 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.

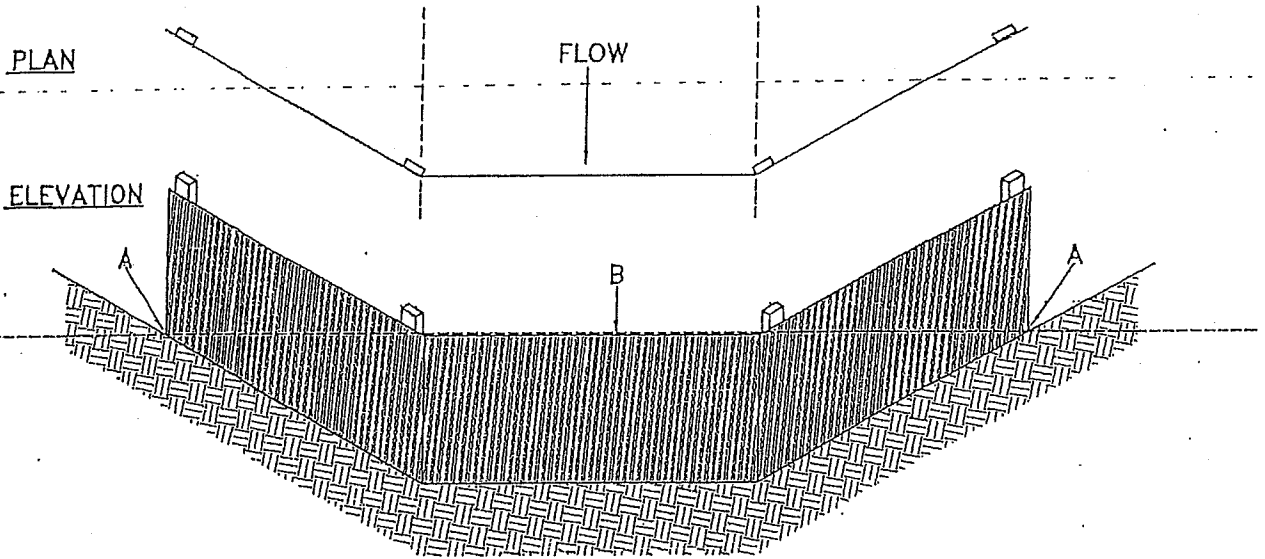


3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.

4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



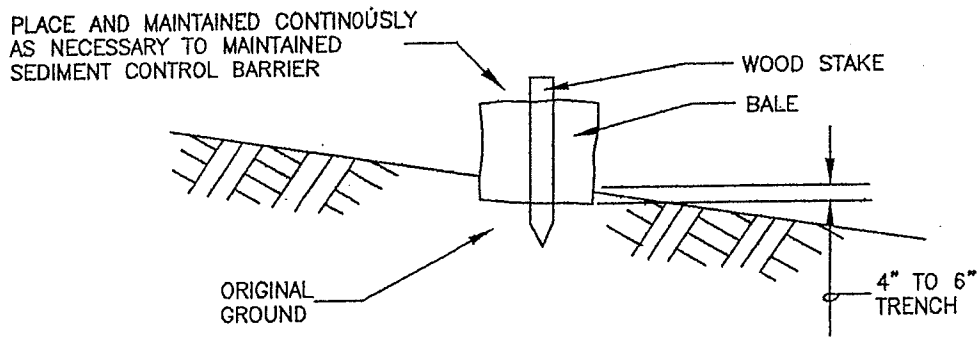
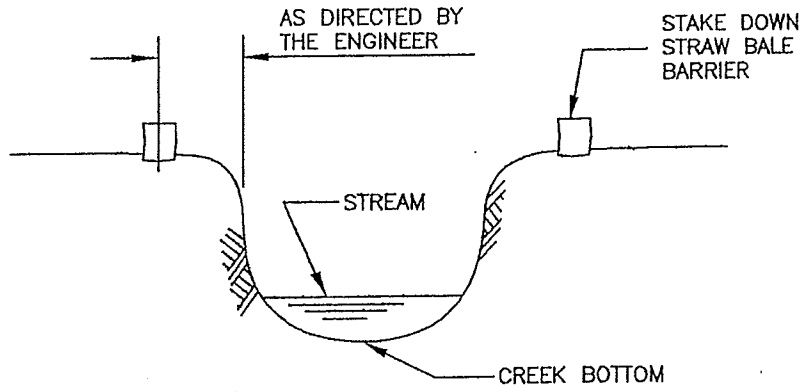
CONSTRUCTION OF A FILTER BARRIER



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

GAS MAINS AND APPURTENANCES

SECTION 4

TESTING AND ACCEPTANCE

1. GENERAL

Upon completion of the construction work, the Contractor shall conduct the necessary pressure tests. The Contractor shall furnish all labor, tools, equipment and materials for making the tests. In the event that the pressure test is unsatisfactory, 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 and shall be conducted in accordance with DOT pipeline safety regulations with particular reference to Sections 192.513, 192.515 and 192.517.

Any repairs required to be made by the Contractor due to faulty or inferior work performed by the Contractors shall be at the Contractor's expense. Any repairs to be made due to defective pipe or material shall be paid for by the Owner at the Contractor's actual cost.

The gas main shall be cleaned internally prior to any tapping or purging operation. Internal cleaning shall be done with cleaning pigs, propelled by compressed air. The number and type of pigs to be run shall be determined by the Engineer. All labor and equipment necessary for the cleaning shall be furnished by the Contractor at no additional cost to the Owner.

Upon completion of the internal cleaning and upon completion and acceptance of pressure test described hereinafter, the Contractor shall make all tie-ins shown on the Drawings to make a complete and operational gas main. Contractor shall submit for approval by the Engineer the method and procedure to be used for required connections. The timing of connections and tie-ins shall be approved by the Owner. The Contractor shall furnish all tapping equipment necessary to make "hot taps" that may be involved with the tie-in. As part of this tie-in, the Contractor shall perform all necessary welding operations, pipe work, and furnish all labor, equipment, and materials for a complete and operational tie-in/connection.

2. PRESSURE TEST

Each section of the completed gas main and service line shall be subjected to a pressure test. The section to be tested shall be valved or blocked off to substantiate the maximum allowable operating/test pressure. The test medium must be air or inert gas or other media as may be approved by the Engineer. Test requirements shall comply fully for Subpart J of the DOT Pipeline Safety Regulations Section 192.501 through 192.517. Relative to these requirements as well as other requirements of Part 192 of the DOT Pipeline, the MAOP established for this project will develop hoop stress of less than 20 percent of the Specified minimum yield strength.

As indicated on the Contract Drawings, the steel gas main shall be tested to 1,080 psig. The Contractor shall sustain the test pressure for a minimum of four hours. An hourly tabulation of test pressure logs and a recording chart of pressure readings shall be maintained by the Contractor suitable for the Owner's permanent record of the main line test. Pressure gauges and recorders shall be calibrated before and after each test using a dead weight tester to be furnished by the Contractor.

The Contractor shall submit to the Engineer for approval the procedures and methods to be used to test the gas mains.

In general terms, a test compressor shall be used to build up the required test pressure. When the test pressure is obtained, the compressor shall be valved off and the pressure observed and recorded over the testing period. A drop in pressure during the test shall be taken as an indication of a leak.

In such case, the Contractor shall make necessary repairs and again conduct the pressure test. This process shall be continued until the acceptable results are obtained.

The Contractor shall provide suitable first quality pressure gauges with 5 lb. or smaller graduations. Pressure recording gauges shall be in good condition and shall be subject to such tests for proof of accuracy as the Engineer may require.

3. TESTING OF VALVES

Upon completion of this project, the Contractor shall operate all buried valves in the presence of the Engineer to verify proper operation of each valve.

GAS MAINS AND APPURTENANCES

SECTION 5

MEASUREMENT AND PAYMENT

1. GENERAL

The Contractor shall furnish all materials, 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, cleaning, pigging, 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.

Gas piping, fittings, valves, and all other materials shall be provided by the Contractor. The Contractor shall merge in items most related to the material and all costs/expenses necessary to load, haul, handle, unload and store such material for subsequent installation.

2. GAS MAINS

A. Measurement - Gas mains shall be measured for payment by horizontal measurements or station distances along the centerline of the pipe to the nearest 0.1 foot. The cost to furnish and install all fittings/bends shall be merged with pipe most related to the fittings. Gas main and service line size shall be based on nominal pipe diameter as shown on the Drawings and/or included in the Bid Proposal.

B. Payment - Gas mains and service lines shall be paid for on the basis of the respective unit prices bid per linear foot for pipe of the various sizes.

For installing the gas mains, payment shall constitute compensation in full for furnishing all materials, labor, tools, equipment and materials and installing and testing the gas mains, fittings/bends complete, including incidental work such as location and protection of existing utilities, clearing, excavation (unclassified), dewatering trenches, bedding with selected material/sand, detectable/marking tape, cathodic test stations, coordination with the Owner for the Owner's non-destructive testing (x-raying), backfilling, 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.

Payment for gas main in bore shall be from face of bore to face of bore and to the limits and sizes established in the Proposal Section. Roadway bores are separated between bores under State Highways and bores under roadways and/or driveways. See Section for "Unit Price Items Ordered by the Engineer."

Note: Casing pipes for bores on steel gas mains are not required.

The Contractor's attention is directed to the fact that portions of the proposed gas mains are to be constructed under existing driveways, roadways, and/or parking lots. The Contractor shall be required to furnish and place crushed stone backfill at these locations from the gas main bedding and envelope to the roadway surface. All costs associated with furnishing and placing this crushed stone backfill shall be merged into the unit price for gas mains. No separate payment shall be made.

3. TOPSOILING AND SEEDING OF TRENCHES

- A. Measurement - Measurement for topsoiling and seeding of trenches will be made by the linear foot of trench along the centerline of the gas 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.

4. GAS LINE/VALVE MARKERS

- A. Measurement - Measurement for gas line/valve markers will be made by actual count of each installed.
- B. Payment - Payment shall be made at the unit price bid and shall include all costs of labor and materials.

5. 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 gas 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 gas 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.

6. SILT FENCING

- A. Measurement - Silt fencing will be measured by the actual quantity measured by the linear foot along the silt fencing required.
- B. Payment - Payment for silt fencing shall be made in accordance with the unit price bid and shall include the cost of all labor, material, and maintenance of the silt fencing required and for the duration needed.

7. CATHODIC TEST STATIONS

Note: Cathodic test stations shall be merged into the unit price bid for gas mains. No separate payment shall be made.

8. ROADWAY MAINTENANCE - "COLD MIX"

- A. Measurement - Measurement for temporary trench repairs using bituminous "cold mix" shall be by the ton.
- B. Payment - Payment for "cold mix" shall be made in accordance with the unit price bid for each ton and shall include the cost of labor and materials necessary for the application of this item.

9. EARTHEN CHECK DAMS

- A. Measurement - Measurement for earthen check dams will be made by the actual number installed.
- B. Payment - Payment shall be made at the unit price bid for each and shall include all costs of labor and materials (including clay soil) for the completion of this item.

10. ROADWAY/DRIVEWAY BORE PIT AND SET-UPS

- A. Measurement - Measurement for the bore pit and set-ups will be measured by actual count of each bore pit and set-up for State Highway, roadway, and/or driveway bored.
- B. Payment - Payment for bore pit and set-up shall constitute compensation in full for all materials, labor, tools, equipment, excavation, stabilization, backfill, dewatering, bedding, disposal of surplus excavated materials, restoration and all other work and materials required.

11. ROADWAY AND/OR DRIVEWAY BORES

Roadway and/or driveways to be bored, except for State Highways, shall be determined by the Owner/Engineer.

Payment to the Contractor will be either open-cut gas main and roadway restoration or bore pit/set-up and gas main in bore. The decision to bore or not to bore is solely the decision of the Owner/Engineer.

12. PLAIN STONE RIP-RAP

- A. Measurement - Measurement for plain stone rip-rap along stream banks will be made by the square yard of rip rap actually installed.
- B. Payment - Payment shall be made at the unit price bid per square yard and shall include all costs of labor and materials (including plain stone rip-rap material) for the completion of this item.

13. CLASS C CONCRETE CAPS

- A. Measurement - Class C concrete used in caps will be measured by linear foot along the centerline of the concrete cap 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 or as indicated on the Drawings.
- 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.

14. 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 $(\frac{4}{3} \text{ pipe O.D.} + 24)/12 \times \text{length} \times \text{depth}$ divided by 27.
- 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.

15. 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 $(\frac{4}{3} \text{ O.D.} + 24/12) (\text{length (ft)}) (\text{depth (ft)})$ 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 gas main and/or gas main under roadway.

16. LUMP SUM CONSTRUCTION ITEMS

Measurement and payment for special Lump Sum Items and/or Lump Sum Each Items shall be as indicated in the Contract Documents.

N O T I C E

**DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
(NATIONWIDE PERMIT AUTHORIZATION)**

PROJECT: Grayson County (US 62), Item No. 4-193.00
Reconstruction of US 62 at Leitchfield, Taylor Fork

The Section 404 activities for this project have been previously permitted under the authority of the Department of the Army Nationwide Permit No. 14 "*Linear Transportation Crossing*". In order for this authorization to be valid, the attached conditions must be followed. The contractor shall post a copy of this Nationwide Permit in a conspicuous location at the project site for the duration of construction and comply with the general conditions as required.

To more readily expedite construction, the contractor may elect to alter the design or perform the work in a manner different from what was originally proposed and specified. Prior to commencing such alternative work, the contractor shall obtain **written** permission from the Division of Construction and the Corps of Engineers. A copy of any request to the Corps of Engineers to alter this proposal and subsequent responses shall be forwarded to the Division of Environmental Analysis, DA Permit Coordinator, for office records and for informational purposes.



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE, KENTUCKY 40201-0059
FAX: (502) 315-6677
<http://www.lrl.usace.army.mil/>

July 23, 2004

Operations Division
Regulatory Branch (South)
ID No. 200400687-bkc

Mr. Keith Crim
Commonwealth of Kentucky
Transportation Cabinet
Division of Environmental Analysis (5-2)
200 Mero Street, 5th Floor
Frankfort, Kentucky 40622

Dear Mr. Crim:

This is in response to your request for authorization to place a culvert in Taylor Fork and two ephemeral streams in connection with the reconstruction of U.S. 62 in Leitchfield, Grayson County, Kentucky. The project identification is Item No. 4-193.00. The information supplied by you was reviewed to determine whether a Department of the Army (DA) permit would be required under the provisions of Section 404 of the Clean Water Act.

Your project is considered a discharge of backfill or bedding material for a road crossing. The project is authorized under the provisions of 33 CFR 330 A Nationwide Permit (NWP) No. 14, Linear Transportation Crossings, as published in the Federal Register January 15, 2002. Under the provisions of this authorization you must comply with the enclosed:

1. Terms for Nationwide Permit No. 14;
2. Nationwide Permit General Conditions; and
3. Water Quality Certification (WQC) Conditions for Nationwide Permit No. 14 dated March 17, 2002, issued by the Kentucky Division of Water.

Once you obtain your certification, or if no application was required, you may proceed with the project without further contact or verification from us. The enclosed Compliance Certification should be signed and returned when the project is completed. This decision is valid for 2 years from the date of this letter. If your project is not completed within this 2-year period or if your project is modified you must contact us for another permit determination. A copy of this letter is being sent to the Division of Water.

If you have any questions, please contact me by writing to the above address, ATTN: CELRL-OP-FS, or by calling (502) 315-6679. Any correspondence on this matter should refer to our ID No. 200400687-bkc.

Sincerely,

A handwritten signature in black ink that reads "Brenda Carter". The signature is written in a cursive, flowing style.

Brenda Carter
Regulatory Specialist
Regulatory Branch

Enclosures

TERMS FOR NATIONWIDE PERMIT NO. 14

Activities required for the construction, expansion, modification, or improvement of linear transportation crossings (e.g., highways, railways, trails, and airport runways and taxiways) in waters of the United States, including wetlands, provided the activity meets the following criteria:

a. This NWP is subject to the following acreage and linear limits:

(1) For public linear transportation projects in non-tidal waters, provided the discharge does not cause the loss of greater than 1/2 acre of waters of the United States, or

(2) For public linear transportation projects in tidal waters or non-tidal wetlands adjacent to tidal waters, provided the discharge does not cause the loss of greater than 1/3 acre of waters of the United States,

b. The permittee must notify the District Engineer in accordance with General Condition 13 if any of the following criteria are met:

(1) The discharge causes the loss of greater than 1/10 acre of waters of the United States; or

(2) There is a discharge in a special aquatic site, including wetlands;

c. The notification must include a compensatory mitigation proposal to offset permanent losses of waters of the United States to ensure that those losses result only in minimal adverse effects to the aquatic environment and a statement describing how temporary losses of waters of the United States will be minimized to the maximum extent practicable;

d. For discharges in special aquatic sites, including wetlands, the notification must include a delineation of the affected special aquatic sites;

e. The width of the fill is limited to the minimum necessary for the crossing;

f. This permit does not authorize stream channelization, and the authorized activities must not cause more than minimal changes to the hydraulic flow characteristics of the stream, increase flooding, or cause more than minimal degradation of water quality of any stream (see General Conditions 9 and 21);

g. This permit cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars; and

h. The crossing is a single and complete project for crossing a water of the United States. Where a road segment (i.e., the shortest segment of a road with independent utility that is part of a larger project) has multiple crossings of streams (several single and complete projects) the Corps will consider whether it should use its discretionary authority to require an individual permit. (Sections 10 and 404)Note: Some discharges for the construction of farm roads, forest roads, or temporary roads for moving mining equipment may be eligible for an exemption from the need for a Section 404 permit (see 33 CFR 323.4).

NATIONWIDE PERMIT CONDITIONS

General Conditions: The following general conditions must be followed in order for any authorization by a NWP to be valid:

1. **Navigation.** No activity may cause more than a minimal adverse effect on navigation.
2. **Proper Maintenance.** Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
4. **Aquatic Life Movements.** No activity may substantially disrupt the life-cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. **Equipment.** Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. **Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions, which may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state or tribe in its Section 401 Water Quality Certification and Coastal Zone Management Act consistency determination.
7. **Wild and Scenic Rivers.** No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible mix inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, US Forest Service, Bureau of Land Management, US Fish and Wildlife Service).
8. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
9. **Water Quality.** (a) In certain States and tribal lands an individual 401 water quality certification must be obtained or waived (See 33 CFR 330.4(c)).
(b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the State or tribal 401 certification (either generically or individually) does not require or approve a water quality management measures, the permittee must provide water quality management measures that will ensure that the authorized work does not result in more than minimal degradation of water quality (or the Corps determines that compliance with state or local standards, where applicable, will ensure no more than minimal adverse effect on water quality). An important component of a water quality management plan includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality (Refer to General Condition 21 for stormwater management requirements). Another important component of a water quality management plan is the establishment and maintenance of vegetated buffers next to open waters, including streams (Refer to General Condition 19 for vegetated buffer requirements for the NWPs). This condition is only applicable to projects that have the potential to affect water quality. While appropriate measures must be taken, in most cases it is not necessary to conduct detailed studies to identify such measures or to require monitoring.
10. **Coastal Zone Management.** In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived (see 33 CFR 330.4(d)).
11. **Endangered Species.** (a) No activity is authorized under any NWP, which is likely to jeopardize the continued existence of a threatened or endangered species, or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. As a result of formal or informal consultation with the FWS or NMFS, the District Engineer may add species-specific regional endangered species conditions to the NWPs.
(b) Authorization of an activity by a nationwide permit does not authorize the 'take' of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with 'incidental take' provisions, etc.) from the US Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal 'takes' of protected species are in violation of the Endangered Species Act. Information on the location of threatened and endangered species and their critical habitat can

be obtained directly from the offices of the US Fish and Wildlife Service and National Marine Fisheries Service or their World Wide Web pages at <http://www.fws.gov/r9endspp/endspp.html> and http://www.nfms.noaa.gov/prot_res/overview/es.html, respectively.

12. Historic Properties. No activity, which may affect historic properties, listed, or eligible for listing, in the National Register of Historic Places is authorized, until the DE has complied with the provisions of 33 CFR part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)). For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the notification must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

13. Notification. (a) **Timing:** Where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a preconstruction notification (PCN) as early as possible. The District Engineer must determine if the PCN is complete within 30 days of the date of receipt and can request the additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the District Engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the District Engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division Engineer; or

(2) If notified in writing by the District or Division Engineer that an individual permit is required; or

(3) Unless 45 days have passed from the District Engineer's receipt of the complete notification and the prospective permittee has not received written notice from the District or Division Engineer. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) **Contents of Notification:** The notification must be in writing and include the following information:

(1) Name, address, and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) Used or intended to be Used to authorize any part of the proposed project or any related activity. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP (Sketches usually clarify the project and when provided result in a quicker decision); and

(4) For NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43, the PCN must also include a delineation of affected special aquatic sites, including wetlands, vegetated shallows (e.g., submerged aquatic vegetation, seagrass beds), and riffle and pool complexes (see paragraph 13(f));

(5) For NWP 7, Outfall Structures and Maintenance, the PCN must include information regarding the original design capacities and configurations of those areas of the facility where maintenance dredging or excavation is proposed.

(6) For NWP 14, Linear Transportation Projects, the PCN must include a compensatory mitigation proposal to offset permanent losses of waters of the US and a statement describing how temporary losses of waters of the US will be minimized to the maximum extent practicable.

(7) For NWP 21, Surface Coal Mining Activities, the PCN must include an Office of Surface Mining (OSM) or state-approved mitigation plan. To be authorized by this NWP, the District Engineer must determine that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are minimal both individually and cumulatively and must notify the project sponsor of this determination in writing;

(8) For NWP 27, Stream and Wetland Restoration Activities, the PCN must include documentation of the prior condition of the site that will be reverted by the permittee.

(9) For NWP 29, Single-Family Housing, the PCN must also include:

(i) Any past use of this NWP by the individual permittee and/or the permittee's spouse;

(ii) A statement that the single-family housing activity is for a personal residence of the permittee;

(iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 1/4 acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 1/4 acre in size, a formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(10) For NWP 31, Maintenance of Existing Flood Control Facilities, the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

(i) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site.

(11) For NWP 33, Temporary Construction, Access, and Dewatering, the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources.

(12) For NWP's 39, 43, and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization of losses of waters of the US were achieved on the project site.

(13) For NWP 39 and NWP 42, the PCN must include a compensatory mitigation proposal that offsets unavoidable losses of waters of the US or justification explaining why compensatory mitigation should not be required. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(14) For NWP 40 (Agricultural Activities), the PCN must include a compensatory mitigation proposal to offset losses of waters of the US. This NWP does not authorize the relocation of greater than 300 linear-feet of existing serviceable drainage ditches constructed in non-tidal streams unless, for drainage ditches constructed in intermittent non-tidal streams, the District Engineer waives this criterion in writing, and the District Engineer has determined that the project complies with all terms and conditions of this NWP, and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;

(15) For NWP 43 (Stormwater Management Facilities), the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with state and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the US. For discharges that cause the loss of greater than 300 linear feet of an intermittent streambed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(16) For NWP 44, Mining Activities, the PCN must include a description of all waters of the US adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the US, a description of measures taken to comply with the criteria of the NWP, and a reclamation plan (for aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral mining activities).

(17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work.

(18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include vicinity map indicating the location of the historic property.

(c) Form of Notification: The standard individual permit application form (Form ENG 4345) may be Used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(19) of General Condition 13. A letter containing the requisite information may also be used.

(d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may, optionally, submit a proposed mitigation plan with the PCN to expedite the process and the District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary. Any compensatory mitigation proposal must be approved by the District Engineer prior to commencing work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant stating that the project can proceed under the terms and conditions of the nationwide permit. If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then he will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the District Engineer determines that mitigation is required in order to ensure no more than minimal adverse effects on the aquatic environment, the activity will be authorized within the 45-day PCN period, including the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level. When conceptual mitigation is included, or a mitigation plan is required under item (2) above, no work in waters of the US will occur until the District Engineer has approved a specific mitigation plan.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and State agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse effects on the aquatic environment to a minimal level.

For activities requiring notification to the District Engineer that result in the loss of greater than 1/2 acre of waters of the US, the District Engineer will, upon receipt of a notification, provide immediately (e.g., via facsimile transmission, overnight mail, or other expeditious manner), a copy to the appropriate offices of the Fish and Wildlife Service, State natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the National Marine Fisheries Service. With the exception of NWP 37, these agencies will then have 10 calendar days from the

date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 15 calendar days before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. As required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, the District Engineer will provide a response to National Marine Fisheries Service within 30 days of receipt of any Essential Fish Habitat conservation recommendations. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(f) **Wetlands Delineations:** Wetland delineations must be prepared in accordance with the current method required by the Corps. For NWP 29 see paragraph (b)(9)(iii) for parcels less than 1/4 acre in size. The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 45-day period will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

14. Compliance Certification. Every permittee who has received a nationwide permit verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter. The certification will include: (a) A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions; (b) A statement that any required mitigation was completed in accordance with the permit conditions; and (c) The signature of the permittee certifying the completion of the work and mitigation.

15. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the US authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the US for the total project cannot exceed 1/3 acre.

16. Water Supply Intakes. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may occur in the proximity of a public water supply intake except where the activity is for repair of the public water supply intake structures or adjacent bank stabilization.

17. Shellfish Beds. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4.

18. Suitable Material. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.) and material Used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

19. Mitigation. The District Engineer will consider the factors discussed below when determining the acceptability of appropriate and practicable mitigation necessary to offset adverse effects on the aquatic environment that are more than minimal.

(a) The project must be designed and constructed to avoid and minimize adverse effects to waters of the US to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland impacts requiring a PCN, unless the District Engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. Consistent with National policy, the District Engineer will establish a preference for restoration of wetlands as compensatory mitigation, with preservation used only in exceptional circumstances.

(d) Compensatory mitigation (i.e., replacement or substitution of aquatic resources for those impacted) will not be used to increase the acreage losses allowed by the acreage limits of some of the NWPs. For example, 1/4 -acre of wetlands cannot be created to change a 3/4 -acre loss of wetlands to a 1/2 -acre loss associated with NWP 39 verification. However, 1/2 -acre of created wetlands can be used to reduce the impacts of a 1/2 -acre loss of wetlands to the minimum impact level in order to meet the minimal impact requirement associated with NWPs.

(e) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., easements, deed restrictions) of vegetated buffers to open waters. In many cases, vegetated buffers will be the only compensatory mitigation required. Vegetated buffers should consist of native species. The width of the vegetated buffers required will address documented water quality or aquatic habitat loss concerns. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineers may require slightly wider vegetated buffers to address documented water quality or habitat loss concerns. Where both wetlands and

open waters exist on the project site, the Corps will determine the appropriate compensatory mitigation (e.g., stream buffers or wetlands

compensation) based on what is best for the aquatic environment on a watershed basis. In cases where vegetated buffers are determined to be the most appropriate form of compensatory mitigation, the District Engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland impacts.

(g) Compensatory mitigation proposals submitted with the "notification" may be either conceptual or detailed. If conceptual plans are approved under the verification, then the Corps will condition the verification to require detailed plans be submitted and approved by the Corps prior to construction of the authorized activity in waters of the US.

(h) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases that require compensatory mitigation, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

20. Spawning Areas. Activities, including structures and work in navigable waters of the US or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.

21. Management of Water Flows. To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and provide for not increasing water flows from the project site, relocating water, or redirecting water flow beyond preconstruction conditions. Stream channelizing will be reduced to the minimal amount necessary, and the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows. In most cases, it will not be a requirement to conduct detailed studies and monitoring of water flow.

This condition is only applicable to projects that have the potential to affect waterflows. While appropriate measures must be taken, it is not necessary to conduct detailed studies to identify such measures or require monitoring to ensure their effectiveness. Normally, the Corps will defer to state and local authorities regarding management of water flow.

22. Adverse Effects From Impoundments. If the activity, including structures and work in navigable waters of the US or discharge of dredged or fill material, creates an impoundment of water, adverse effects on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.

23. Waterfowl Breeding Areas. Activities, including structures and work in navigable waters of the US or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

24. Removal of Temporary Fills. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

25. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed threatened and endangered species, coral reefs, State natural heritage sites, and outstanding national resource waters or other waters officially designated by a State as having particular environmental or ecological significance and identified by the District Engineer after notice and opportunity for public comment. The District Engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Except as noted below, discharges of dredged or fill material into waters of the US are not authorized by NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. Discharges of dredged or fill materials into waters of the US may be authorized by the above NWPs in National Wild and Scenic Rivers if the activity complies with General Condition 7. Further, such discharges may be authorized in designated critical habitat for Federally listed threatened or endangered species if the activity complies with General Condition 11 and the US Fish and Wildlife Service or the National Marine Fisheries Service has concurred in a determination of compliance with this condition.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with General Condition 13, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The District Engineer may authorize activities under these NWPs only after he determines that the impacts to the critical resource waters will be no more than minimal.

26. Fills Within 100-Year Floodplains. For purposes of this General Condition, 100-year floodplains will be identified through the existing Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or FEMA-approved local floodplain maps.

(a) *Discharges in Floodplain; Below Headwaters.* Discharges of dredged or fill material into waters of the US within the mapped 100-year floodplain, below headwaters (i.e. five cfs), resulting in permanent above-grade fills, are not authorized by NWPs 39, 40, 42, 43, and 44.

(b) *Discharges in Floodway; Above Headwaters.* Discharges of dredged or fill material into waters of the US within the FEMA or locally mapped floodway, resulting in permanent above-grade fills, are not authorized by NWPs 39, 40, 42, and 44.

(c) The permittee must comply with any applicable FEMA-approved state or local floodplain management requirements.

27. Construction Period. For activities the Corps has not verified that and the project were commenced or under contract to commence by the

expiration date of the NWP (or modification or revocation date), the work must be completed within 12 months after such date (including any modification that affects the project).

For activities that have been verified and the project was commenced or under contract to commence within the verification period, the work must be completed by the date determined by the Corps.

For projects that have been verified by the Corps, an extension of a Corps approved completion date maybe requested. This request must be submitted at least one month before the previously approved completion date.

D. Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other Federal, State, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.

Section 10 Special Condition: The permittee understands and agrees that, if future operations by the US require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or is authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structure work or obstructions caused thereby, without expense to the US. No claim shall be made against the US on account of any such removal or alteration.

Compliance Certification:

Permit Number: 200400687-bkc

Name of Permittee: Commonwealth of Kentucky Transportation Cabinet

Date of Issuance: July 23, 2004

Upon completion of the activity authorized by this permit and any mitigation required by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
CELRL-OP-FS
P.O. Box 59
Louisville, Kentucky 40201

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

N O T I C E

DIVISION OF WATER (WATER QUALITY CERTIFICATION)

PROJECT: Grayson County (US 62), Item No. 4-193.00
Reconstruction of US 62 at Leitchfield, Taylor Fork

The Division of Water has previously approved the Section 401 activities for this project by issuance of a General Water Quality Certification for Nationwide Permit #14, "Road Crossings". In order for this authorization to be valid, the attached conditions must be followed. The contractor shall post a copy of this Water Quality Certification in a conspicuous location at the project site for the duration of construction and comply with the general conditions as required.

To more readily expedite construction, the contractor may elect to alter the design or perform the work in a manner different from what was originally proposed and specified. Prior to commencing such alternative work, the contractor shall obtain **written** permission from the Division of Construction and the appropriate permit agency. A copy of any request to alter this proposal and subsequent responses shall be forwarded to the Division of Environmental Analysis, DA Permit Coordinator, for office records and for informational purposes.

JAMES E. BICKFORD
SECRETARY



PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

General Certification--Nationwide Permit #14
Road Crossings

This General Certification is issued on March 17, 2002, in conformity with the requirements of Section 401 of the Clean Water Act of 1977, as amended (33USC 1314), as well as Kentucky Statute KRS 224.16-070.

The Commonwealth of Kentucky hereby certifies under Section 401 of the Clean Water Act (CWA) that it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 5, established pursuant to Sections 301, 302, 304, 306 and 307 of the CWA, will not be violated for the activity covered under 33 CFR Part 330 Appendix A(B) (14), namely road crossings provided that the following conditions are met:

1. Individual road culvert or bridges, either for public or private purposes, that exceed 200 linear feet in width shall require an individual Water Quality Certification.
2. Stream and riparian impacts will be limited to the minimum necessary to construct the road crossing. For the purpose of this General Certification, streams are defined as a solid or dashed blue line on the most recent version of USGS 1:24,000 topographic map.
3. All equipment access and excavations within a stream, necessary to complete a road crossing project, shall be done in such a manner as to prevent degradation of Waters of the Commonwealth. Temporary equipment crossing structures shall be constructed with sufficient pipe capacity so as not to impede normal stream flow.
4. Stream bed gravel and rock shall not be used for construction material.
5. The stream crossing structure shall be constructed in such a manner that does not impede the movement of aquatic organisms. The bottom of any culverts shall be level with the stream bed.
6. This General Certification shall not apply to those waters of the Commonwealth identified as Outstanding State Resource Waters, Exceptional Waters or Cold Water Aquatic Habitat Waters, as designated by the Division of Water. An individual Water Quality Certification will be required for projects in these waters.
7. Stream impacts covered under this nationwide permit and undertaken by those persons defined as an agricultural operation under the Agricultural Water Quality Act must be completed in compliance with the Kentucky Agricultural Water Quality Plan.



Nationwide Permit # 14
Page Two

Non-compliance with the conditions of this general certification or violation of Kentucky state water quality standards may result in civil penalties.

This general certification will expire on March 19, 2007, or sooner if the COE makes significant changes to this nationwide permit.

ADDRESS FOR COORDINATING AGENCY

Mr. Jeffrey W. Pratt
Director
Division of Water
Natural Resources and Environmental
Protection Cabinet
18 Reilly Road, Ash Building
Frankfort, Kentucky 40601

KyTC BMP Plan for Project PCN ## - #####



Kentucky Transportation Cabinet

Highway District 4

And

_____ **(2), Construction**

**Kentucky Pollutant Discharge Elimination System
Permit KYR10
Best Management Practices (BMP) plan**

Groundwater protection plan

For Highway Construction Activities

For

**The Widening of US62 from KY259 to the
Leitchfield Bypass**

Project: PCN ## - #####

KyTC BMP Plan for Project PCN ## - #####

Project information

Note – (1) = Design (2) = Construction (3) = Contractor

1. Owner – Kentucky Transportation Cabinet, District 4
2. Resident Engineer: (2)
3. Contractor name: (2)
Address: (2)

Phone number: (2)
Contact: (2)
Contractors agent responsible for compliance with the KPDES permit requirements (3):
4. Project Control Number (2)
5. Route – **US62**
6. Latitude/Longitude – **37 Degrees 29 minutes north, 86 degrees 17 minutes west**
7. County - **Grayson**
8. Project start date (date work will begin): (2)
9. Projected completion date: (2)

KyTC BMP Plan for Project PCN ## - #####

A. Site description:

1. Nature of Construction Activity – **Roadway Widening**
2. Order of major soil disturbing activities (2) and (3)
3. Projected volume of material to be moved – **14,621 cubic yards**
4. Estimate of total project area – **Approximately 25 acres**
5. Estimate of area to be disturbed – **Approximately 20 acres.**
6. Post construction runoff coefficient will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information.
7. Data describing existing soil condition (2)
8. Data describing existing discharge water quality (2)
9. Receiving water name – **Taylor Fork**
10. TMDLs and Pollutants of Concern in Receiving Waters: **No TMDLs were involved on this project.**
11. Site map – Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.

12. Potential sources of pollutants:

The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include oil/fuel/grease from servicing and operating construction equipment, concrete washout water, sanitary wastes and trash/debris. (3)

KyTC BMP Plan for Project PCN ## - #####

B. Sediment and Erosion Control Measures:

1. Plans for highway construction projects will include erosion control sheets that depict Disturbed Drainage Areas (DDAs) and related information. These plan sheets will show the existing project conditions with areas delineated by DDA within the right of way limits, the discharge points and the areas that drain to each discharge point. Project managers and designers will analyze the DDAs and identify Best Management Practices (BMPs) that are site specific. The balance of the BMPs for the project will be listed in the bid documents for selection and use by the contractor on the project with approval by the resident engineer.

Projects that do not have DDAs annotated on the erosion control sheets will employ the same concepts for development and managing BMP plans.

2. Following award of the contract, the contractor and resident engineer will annotate the erosion control sheets showing location and type of BMPs for each of the DDAs that will be disturbed at the outset of the project. This annotation will be accompanied by an order of work that reflects the order or sequence of major soil moving activities. The remaining DDAs are to be designated as "Do Not Disturb" until the contractor and resident engineer prepare the plan for BMPs to be employed. The initial BMP's shall be for the first phase (generally Clearing and Grubbing) and shall be modified as needed as the project changes phases. The BMP Plan will be modified to reflect disturbance in additional DDA's as the work progresses. All DDA's will have adequate BMP's in place before being disturbed.
3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:
 - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
 - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.

KyTC BMP Plan for Project PCN ## -

- Clearing and Grubbing – The following BMP's will be considered and used where appropriate.
 - Leaving areas undisturbed when possible.
 - Silt basins to provide silt volume for large areas.
 - Silt Traps Type A for small areas.
 - Silt Traps Type C in front of existing and drop inlets which are to be saved
 - Diversion ditches to catch sheet runoff and carry it to basins or traps or to divert it around areas to be disturbed.
 - Brush and/or other barriers to slow and/or divert runoff.
 - Silt fences to catch sheet runoff on short slopes. For longer slopes, multiple rows of silt fence may be considered.
 - Temporary Mulch for areas which are not feasible for the fore mentioned types of protections.
 - Non-standard or innovative methods.
- Cut & Fill and placement of drainage structures - The BMP Plan will be modified to show additional BMP's such as:
 - Silt Traps Type B in ditches and/or drainways as they are completed
 - Silt Traps Type C in front of pipes after they are placed
 - Channel Lining
 - Erosion Control Blanket
 - Temporary mulch and/or seeding for areas where construction activities will be ceased for 21 days or more.
 - Non-standard or innovative methods
- Profile and X-Section in place – The BMP Plan will be modified to show elimination of BMP's which had to be removed and the addition of new BMP's as the roadway was shaped. Probably changes include:
 - Silt Trap Type A, Brush and/or other barriers, Temporary Mulch, and any other BMP which had to be removed for final grading to take place.
 - Additional Silt Traps Type B and Type C to be placed as final drainage patterns are put in place.
 - Additional Channel Lining and/or Erosion Control Blanket.
 - Temporary Mulch for areas where Permanent Seeding and Protection cannot be done within 21 days.
 - Special BMP's such as Karst Policy
- Finish Work (Paving, Seeding, Protect, etc.) – A final BMP Plan will result from modifications during this phase of construction. Probably changes include:
 - Removal of Silt Traps Type B from ditches and drainways if they are protected with other BMP's which are sufficient to control erosion, i.e. Erosion Control Blanket or Permanent Seeding and Protection on moderate grades.

KyTC BMP Plan for Project PCN ## -

- Permanent Seeding and Protection
 - Placing Sod
 - Planting trees and/or shrubs where they are included in the project
- BMP's including Storm Water Management Devices such as velocity dissipation devices and Karst policy BMP's to be installed during construction to control the pollutants in storm water discharges that will occur after construction has been completed are: Permanent riprap channel lining is used in high velocity areas to dissipate the energy.

C. Other Control Measures

1. No solid materials, including building materials, shall be discharged to waters of the commonwealth, except as authorized by a Section 404 permit.
2. Waste Materials

All waste materials that may leach pollutants (paint and paint containers, caulk tubes, oil/grease containers, liquids of any kind, soluble materials, etc.) will be collected and stored in appropriate covered waste containers. Waste containers shall be removed from the project site on a sufficiently frequent basis as to not allow wastes to become a source of pollution. All personnel will be instructed regarding the correct procedure for waste disposal. Wastes will be disposed in accordance with appropriate regulations. Notices stating these practices will be posted in the office.

3. Hazardous Waste

All hazardous waste materials will be managed and disposed of in the manner specified by local or state regulation. The contractor shall notify the Resident Engineer if there any hazardous wastes being generated at the project site and how these wastes are being managed. Site personnel will be instructed with regard to proper storage and handling of hazardous wastes when required. The Transportation Cabinet will file for generator, registration when appropriate, with the Division of Waste Management and advise the contractor regarding waste management requirements.

4. Spill Prevention

The following material management practices will be used to reduce the risk of spills or other exposure of materials and substances to the weather and/or runoff.

- **Good Housekeeping:**

KyTC BMP Plan for Project PCN ## -

The following good housekeeping practices will be followed onsite during the construction project.

- An effort will be made to store only enough product required to do the job
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure
- Products will be kept in their original containers with the original manufacturer's label
- Substances will not be mixed with one another unless recommended by the manufacturer
- Whenever possible, all of the product will be used up before disposing of the container
- Manufacturers' recommendations for proper use and disposal will be followed
- The site contractor will inspect daily to ensure proper use and disposal of materials onsite

➤ **Hazardous Products:**

These practices will be used to reduce the risks associated with any and all hazardous materials.

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data sheets (MSDS) will be reviewed and retained
- Contractor will follow procedures recommended by the manufacturer when handling hazardous materials
- If surplus product must be disposed of, manufacturers' or state/local recommended methods for proper disposal will be followed

The following product-specific practices will be followed onsite:

➤ **Petroleum Products:**

Vehicles and equipment that are fueled and maintained on site will be monitored for leaks, and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.

KyTC BMP Plan for Project PCN ## -

This project (will / will not) (3) have over 1,320 gallons of petroleum products with a total capacity, sum of all containers 55 gallon capacity and larger.

➤ **Fertilizers:**

Fertilizers will be applied at rates prescribed by the contract, standard specifications or as directed by the resident engineer. Once applied, fertilizer will be covered with mulch or blankets or worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

➤ **Paints:**

All containers will be tightly sealed and stored indoors or under roof when not being used. Excess paint or paint wash water will not be discharged to the drainage or storm sewer system but will be properly disposed of according to manufacturers' instructions or state and local regulations.

➤ **Concrete Truck Washout:**

Concrete truck mixers and chutes will not be washed on pavement, near storm drain inlets, or within 75 feet of any ditch, stream, wetland, lake, or sinkhole. Where possible, excess concrete and wash water will be discharged to areas prepared for pouring new concrete, flat areas to be paved that are away from ditches or drainage system features, or other locations that will not drain off site. Where this approach is not possible, a shallow earthen wash basin will be excavated away from ditches to receive the wash water

➤ **Spill Control Practices**

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted. All personnel will be made aware of procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area. Equipment and materials will include as appropriate, brooms, dust pans, mops, rags, gloves, oil absorbents, sand, sawdust, and plastic and metal trash containers.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.

KyTC BMP Plan for Project PCN ## -

- Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
- The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
- Spills of products will be cleaned up promptly. Wastes from spill clean up will be disposed in accordance with appropriate regulations.

D. Other State and Local Plans

This BMP plan shall include any requirements specified in sediment and erosion control plans, storm water management plans or permits that have been approved by other state or local officials. Upon submittal of the NOI, other requirements for surface water protection are incorporated by reference into and are enforceable under this permit (even if they are not specifically included in this BMP plan). This provision does not apply to master or comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state or local officials.

E. Maintenance

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.
- Maintenance of BMPs during construction shall be a result of weekly and post rain event inspections with action being taken by the contractor to correct deficiencies.
 - Post Construction maintenance will be a function of normal highway maintenance operations. Following final project acceptance by the cabinet, district highway crews will be responsible for identification and correction of deficiencies regarding ground cover and cleaning of storm water BMPs. The project manager shall identify any BMPs that will be for the purpose of post construction storm water management with specific guidance for any non-routine maintenance. (1)

F. Inspections

Inspection and maintenance practices that will be used to maintain erosion and sediment controls:

KyTC BMP Plan for Project PCN ## -

- All erosion prevention and sediment control measures will be inspected at least once each week and following any rain of one-half inch or more.
- Inspections will be conducted by individuals that have received KyTC Grade Level II training or other qualification as prescribed by the cabinet that includes instruction concerning sediment and erosion control.
- Inspection reports will be written, signed, dated, and kept on file.
- Areas at final grade will be seeded and mulched within 14 days.
- Areas that are not at final grade where construction has ceased for a period of 21 days or longer and soil stock piles shall receive temporary mulch no later than 14 days from the last construction activity in that area.
- All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of being reported.
- Built-up sediment will be removed from behind the silt fence before it has reached halfway up the height of the fence.
- Silt fences will be inspected for bypassing, overtopping, undercutting, depth of sediment, tears, and to ensure attachment to secure posts.
- Sediment basins will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 70 percent of the design capacity and at the end of the job.
- Diversion dikes and berms will be inspected and any breaches promptly repaired. Areas that are eroding or scouring will be repaired and re-seeded / mulched as needed.
- Temporary and permanent seeding and mulching will be inspected for bare spots, washouts, and healthy growth. Bare or eroded areas will be repaired as needed.
- All material storage and equipment servicing areas that involve the management of bulk liquids, fuels, and bulk solids will be inspected weekly for conditions that represent a release or possible release of pollutants to the environment.

G. Non – Storm Water discharges

It is expected that non-storm water discharges may occur from the site during the construction period. Examples of non-storm water discharges include:

- Water from water line flushings.
- Water from cleaning concrete trucks and equipment.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).

KyTC BMP Plan for Project PCN ## -

- Uncontaminated groundwater and rain water (from dewatering during excavation).

All non-storm water discharges will be directed to the sediment basin or to a filter fence enclosure in a flat vegetated infiltration area or be filtered via another approved commercial product.

H. Groundwater Protection Plan (3)

This plan serves as the groundwater protection plan as required by 401 KAR 5:037.

- Contractors statement: (3)

The following activities, as enumerated by 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan, will or may be conducted as part of this construction project:

_____ 2. (e) land treatment or land disposal of a pollutant;

_____ 2. (f) Storing, ..., or related handling of hazardous waste, solid waste or special waste, ..., in tanks, drums, or other containers, or in piles, (This does not include wastes managed in a container placed for collection and removal of municipal solid waste for disposal off site);

_____ 2. (g) Handling of materials in bulk quantities (equal or greater than 55 gallons or 100 pounds net dry weight transported held in an individual container) that, if released to the environment, would be a pollutant;

_____ 2. (j) Storing or related handling of road oils, dust suppressants,, at a central location;

_____ 2. (k) Application or related handling of road oils, dust suppressants or deicing materials, (does not include use of chloride-based deicing materials applied to roads or parking lots);

_____ 2. (m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes, (this does not include bore holes for the purpose of explosive demolition);

Or, check the following only if there are no qualifying activities

_____ There are no activities for this project as listed in 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan.

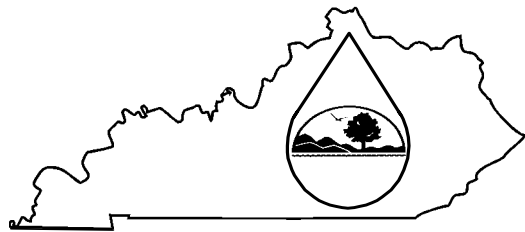
KyTC BMP Plan for Project PCN ## - #####

The contractor is responsible for the preparation of a plan that addresses the

401 KAR 5:037 Section 3. (3) Elements of site specific groundwater protection plan:

- (a) General information about this project is covered in the Project information;
- (b) Activities that require a groundwater protection plan have been identified above;
- (c) Practices that will protect groundwater from pollution are addressed in section C. Other control measures.
- (d) Implementation schedule – all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity;
- (e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provide to the resident engineer.
- (f) Areas of the project and groundwater plan activities will be inspected as part of the weekly sediment and erosion control inspections
- (g) Certification (see signature page.)

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:	KYTC District 4	Phone:	270-766-5066
Address:	634 East Dixie, P. O. Box 309	Status of Owner/Operator:	S
City, State, Zip Code:	Elizabethtown, KY 42702		

II. Facility/Site Location Information

Name:	KYTC PCN		
Address:	US62		
City, State, Zip Code:	Leitchfield, KY 42754		
County:	Grayson		
Site Latitude: (degrees/minutes/seconds)	37 Degrees 29 Minutes North	Site Longitude: (degrees/minutes/seconds)	86 Degrees 17 Minutes West

III. Site Activity Information

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

IV. Additional Information Required FOR CONSTRUCTION ACTIVITIES ONLY

Project Start Date:	Completion Date:
Estimated Area to be disturbed (in acres):	25 Acres
Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

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

Printed or Typed Name:	Patty Dunaway, D4 Chief District Engineer	
Signature:	Date:	

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

WHO MUST FILE A NOTICE OF INTENT (NOI) FORM

Federal law at 40 CFR Part 122 prohibits point source discharges of stormwater associated with industrial activity to a water body of the Commonwealth of Kentucky without a Kentucky Pollutant Discharge Elimination System (KPDES) permit. The operator of an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under the KPDES Storm Water General Permit. If you have questions about whether you need a permit under the KPDES Storm Water program, or if you need information as to whether a particular program is administered by the state agency, call the **Storm Water Contact, Industrial Section, Kentucky Division of Water at (502) 564-3410.**

WHERE TO FILE NOI FORM

NOIs must be sent to the following address:

Section Supervisor
Inventory & Data Management Section
KPDES Branch, Division of Water
Frankfort Office Park
14 Reilly Road
Frankfort, KY 40601

COMPLETING THE FORM

Type or print legibly in the appropriate areas only. If you have any questions regarding the completion of this form call the **Storm Water Contact, Industrial Section, at (502) 564-3410.**

SECTION I - FACILITY OPERATOR INFORMATION

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

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

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

SECTION II - FACILITY/SITE LOCATION INFORMATION

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

SECTION III - SITE ACTIVITY INFORMATION

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

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

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges. If data is available submit with this form.

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

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

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

SECTION IV - ADDITIONAL INFORMATION REQUIRED FOR CONSTRUCTION ACTIVITIES ONLY

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

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

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

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

SECTION V - CERTIFICATION

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, state, Federal, or other public facility: by either a principal executive officer or ranking elected official.

LETTING March 2007

**KENTUCKY TRANSPORTATION CABINET
COMMUNICATING ALL PROMISES (CAP)**

GRAYSON COUNTY

4-193.00

(NO CAPS INVOLVED IN PROJECT)

PART II

SPECIFICATIONS AND STANDARD DRAWINGS

**Supplemental Specifications to The Standard Specifications
for Road and Bridge Construction, 2004 Edition**
(Effective with the July 27, 2007 Letting)

SUBSECTION: REVISION:	105.07 COOPERATION WITH UTILITIES. In the last paragraph, replace “KRS 367 Sections 1 through 10” with “KRS 367.4901 through 367.4917”
SUBSECTION: REVISION:	108.01 SUBCONTRACTING OF CONTRACT. Replace the second and third sentence of the first paragraph with the following: When the Engineer gives such consent, the Engineer will allow the Contractor to subcontract a portion, but the Contractor must perform with his own organization work amounting to no less than 30 percent of the total Contract cost. The Department will not allow any subcontractor to exceed the percentage to be performed by the Contractor and will require the Contractor to maintain a supervisory role over the entire project.
SUBSECTION: REVISION:	109.07 PRICE ADJUSTMENT. Replace the section with the following: 109.07 PRICE ADJUSTMENTS. Due to the fluctuating costs of petroleum products, the Department will adjust the compensation of specified liquid asphalt items and diesel fuel in contracts when contract quantity thresholds are met. 109.07.01 Liquid Asphalt. The Department will compare the Kentucky Average Price Index (KAPI), for the month that the Contract is let, to the index for the month that the Contractor places the material on the project to determine the percent change. When the original contract quantity for asphalt items is equal to or greater than 3,000 tons and when the average price of the liquid asphalt products increases or decreases more than 5 percent, the Department will adjust the Contractor’s compensation. The KAPI is calculated monthly using the average price, per ton at the terminal, from the active suppliers of liquid asphalt. <u>Adjustable Contract Items:</u> <ul style="list-style-type: none">• Asphalt Curing Seal• Asphalt Material for Prime• Asphalt Base, All Classes• Asphalt Binder• Asphalt Surface, All Classes• Sand Asphalt Surface• Asphalt Open-Graded Surface• Asphalt Seal Coat• Asphalt Mixture for Leveling and Wedging• Drainage Blanket - Type II - Asphalt The Department will determine the price adjustment using the following formulas: <u>When PC is greater than PL</u> Asphalt Price Adjustment = $(Q \times A)/100 \times PL \times [(PC-PL)/PL - 0.05]$ <u>When PC is less than PL</u> Asphalt Price Adjustment = $(Q \times A)/100 \times PL \times [(PC-PL)/PL + 0.05]$ Where: Q = Tons of material or mixture placed each month. A = Percent of material or mixture that is asphalt. PL = KAPI for the month that the Contract is let. PC = KAPI for the month that the Contractor places the material or mixture. The job-mix formula for asphalt base, binder, and surface mixtures determines “A”, which is the percent of asphalt. For recycled mixtures, the Department will determine the adjustment for the new asphalt cement only. The Department will consider materials for prime and seal as 100 percent asphalt.

**Supplemental Specifications to The Standard Specifications
for Road and Bridge Construction, 2004 Edition**
(Effective with the July 27, 2007 Letting)

Revision
Continued

109.07.02 Fuel. The Department will adjust the Contractor's compensation when the average price of diesel fuel increases or decreases more than 5 percent and the original Contract quantity for the item on which the fuel is consumed is equal to or greater than the threshold quantities listed in the following table.

<u>Item</u>	<u>Threshold Quantity</u>	<u>Fuel/Work</u>
Roadway Excavation	10,000 cubic yards	0.25
Embankment-in-Place	10,000 cubic yards	0.25
Borrow Excavation	10,000 cubic yards	0.25
DGA Base or Crushed Stone Base	5,000 tons	0.52
Stabilized Aggregate Base	5,000 tons	0.52
Drainage Blanket, Cement Treated or Untreated	5,000 tons	0.52
Drainage Blanket, Asphalt Treated	5,000 tons	3.00
Crushed Sandstone Base (Cement Treated)	5,000 tons	0.52
Hot-Mixed Asphalt Mixtures for Pavements or Shoulders	3,000 tons ⁽¹⁾	3.00
PCC Pavement, Base, or Shoulders	2,000 square yards ⁽²⁾	0.14

⁽¹⁾Total of all hot mixed asphalt Contract items.

⁽²⁾Total of all JPC pavement, JPC shoulder, and PCC base, Contract items.

The Department will determine the price adjustment using the following formulas:

When PC is greater than PL

$$\text{Fuel Price Adjustment} = Q \times F \times PL \times [(PC-PL)/PL - 0.05]$$

When PC is less than PL

$$\text{Fuel Price Adjustment} = Q \times F \times PL \times [(PC-PL)/PL + 0.05]$$

Where:

Q = Quantity for applicable item placed or performed that month.

F = The fuel to work unit ratio for each applicable item.

PL = Average reseller price of diesel fuel, excluding taxes, discounts, and superfund line items, in the Kentucky region for the month that the Contract is let.

PC = Average reseller price of diesel fuel, excluding taxes, discounts, and superfund line items, in the Kentucky region for the month that the Contractor uses the fuel on the project.

109.07.03 Payments and Deductions. When thresholds are met, the Department will adjust the Contractor's compensation for each eligible pay item, paid or deducted, monthly.

If later price decreases indicate that the Department made an overpayment, the Department will withhold the overpayment from succeeding pay estimates on the project, or the Contractor shall immediately refund the over payment to the Department.

When the Contractor places materials during any month after the month that the Contract time (including all approved time extensions) expires, the Department will use the average price for the month that the Contractor places the material or the average price for the last month of the Contract time; whichever is least.

The Department will not grant a time extension for any overrun in the Contract amount due to payments made according to this section. The Department will not make any additional compensation due to adjustments made according to this section.

The Department will adjust the Contractor's compensation on the following months pay estimate and on the final pay estimate. The Department will make the final adjustment of the Contractor's compensation on the final estimate for the project.

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<p>SUBSECTION: 110.01 MOBILIZATION. REVISION: Replace the third paragraph with the following:</p>	<p>Do not bid an amount for Mobilization that exceeds 5 percent of the sum of the total amounts bid for all items in the Bid Proposal, excluding Mobilization, Demobilization, and contingent amounts established for adjustments and incentives. The Department will automatically adjust any bids in excess of this amount to 5 percent for bid comparisons. The Department will base the award on the maximum allowable bid of 5 percent. If any errors in unit bid prices for other Contract items in a Contractor's Bid Proposal are discovered after bid opening and such errors reduce the total amount bid for all other items, excluding Mobilization, Demobilization, and contingent amounts established for adjustments and incentives, so that the percent bid for Mobilization is larger than 5 percent, the Department will adjust the amount bid for Mobilization to 5 percent of the sum of the corrected total bid amounts.</p>						
<p>SUBSECTION: 110.02 DEMOBILIZATION. REVISION: Replace the first sentence of the third paragraph with the following:</p>	<p>Do not bid an amount for Demobilization that is less than 1.5 percent of the sum of the total amounts bid for all other items in the Bid Proposal, excluding Mobilization, Demobilization, and contingent amounts established for adjustments and incentives.</p>						
<p>SUBSECTION: 206.03.03 Compaction. REVISION: Replace "KM 64-412" with "KM 64-002"</p>							
<p>SUBSECTION: 206.04.01 Embankment-in-Place. REVISION: Replace the first sentence of the sixth paragraph with the following:</p>	<p>When payment is made for Embankment-in-Place, the Department will make payment for all embankment constructed on the project, including roadway embankment, refill in cuts, and embankment placed in embankment benches.</p>						
<p>SUBSECTION: 212.03.03 Permanent Seeding and Protection. PART: Delete Part C) and replace Parts A) and B) with the following: REVISION: A) Seed Mixtures for Permanent Seeding.</p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-left: 20px;">Seed Mix Type I:</td> <td style="padding-left: 20px;">30% Kentucky 31 Tall Fescue (<i>Festuca arundinacea</i>) 20% Creeping Red Fescue (<i>Festuca rubra</i>) 35% Hard Fescue (<i>Festuca (Festuca longifolia)</i>) 10% Ryegrass, Perennial (<i>Lolium perenne</i>) 5% White Dutch Clover (<i>Trifolium repens</i>)</td> </tr> <tr> <td style="padding-left: 20px;">Seed Mix Type II:</td> <td style="padding-left: 20px;">55% Kentucky 31 Tall Fescue (<i>Festuca arundinacea</i>) 15% Ryegrass, Perennial (<i>Lolium perenne</i>) 15% (based on pure live seed, PLS) Little Bluestem (<i>Schizachyrium scoparium</i>) 15% Crown Vetch (<i>coronilla varia</i>)</td> </tr> <tr> <td style="padding-left: 20px;">Seed Mix Type III:</td> <td style="padding-left: 20px;">40% Kentucky 31 Tall Fescue (<i>Festuca arundinacea</i>) 15% Perennial Ryegrass <i>Lolium perenne</i>) 20% Sericea Lespedeza (<i>Lespedeza cuneata</i>) 25% (based on pure live seed, PLS) Little Bluestem (<i>Schizachyrium scoparium</i>)</td> </tr> </table> <ol style="list-style-type: none"> 1) Permanent Seeding on Slopes 3:1 or Less. Apply seed mix Type I at a minimum application rate of 100 pounds per acre. 2) Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 4, 5, 6, and 7. Apply seed mix Type II at a minimum application rate of 100 pounds per acre plus a nurse crop of either Cereal Rye or German Foxtail-Millet based on the time of year. During the months of June through August, apply 10 pounds of German Foxtail-Millet (<i>Setaria italica</i>). During the months of September through May, apply 56 pounds of Cereal Rye (<i>Secale cereale</i>). If adjacent to golf courses replace the crown vetch with Kentucky 31 Tall Fescue 	Seed Mix Type I:	30% Kentucky 31 Tall Fescue (<i>Festuca arundinacea</i>) 20% Creeping Red Fescue (<i>Festuca rubra</i>) 35% Hard Fescue (<i>Festuca (Festuca longifolia)</i>) 10% Ryegrass, Perennial (<i>Lolium perenne</i>) 5% White Dutch Clover (<i>Trifolium repens</i>)	Seed Mix Type II:	55% Kentucky 31 Tall Fescue (<i>Festuca arundinacea</i>) 15% Ryegrass, Perennial (<i>Lolium perenne</i>) 15% (based on pure live seed, PLS) Little Bluestem (<i>Schizachyrium scoparium</i>) 15% Crown Vetch (<i>coronilla varia</i>)	Seed Mix Type III:	40% Kentucky 31 Tall Fescue (<i>Festuca arundinacea</i>) 15% Perennial Ryegrass <i>Lolium perenne</i>) 20% Sericea Lespedeza (<i>Lespedeza cuneata</i>) 25% (based on pure live seed, PLS) Little Bluestem (<i>Schizachyrium scoparium</i>)
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Seed Mix Type III:	40% Kentucky 31 Tall Fescue (<i>Festuca arundinacea</i>) 15% Perennial Ryegrass <i>Lolium perenne</i>) 20% Sericea Lespedeza (<i>Lespedeza cuneata</i>) 25% (based on pure live seed, PLS) Little Bluestem (<i>Schizachyrium scoparium</i>)						

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revision continued	<p>3) Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 1, 2, 3, 8, 9, 10, 11, and 12. Apply seed mix Type III at a minimum application rate of 100 pounds per acre plus a nurse crop of either Cereal Rye or German Foxtail-Millet based on the time of year. During the months of June through August, apply 10 pounds of German Foxtail-Millet (<i>Setaria italica</i>). During the months of September through May, apply 56 pounds of Cereal Rye (<i>Secale cereale</i>). If adjacent to crop land or golf course replace the <i>Sericea Lespedeza</i> with Kentucky 31 Tall Fescue.</p> <p>B) Procedures for Permanent Seeding. Include a seeding plan in the Best Management Practices plan (BMP) according to Section 213. Prepare a seedbed and incorporate fertilizer and agricultural limestone as needed. Do not apply dry agricultural Limestone when it may generate a traffic hazard. Remove all rock and dirt clods over 4 inches in diameter from the surface of the seedbed. Unless the Engineer directs otherwise, track all slopes 3:1 or greater. Ensure that tracking is performed up and down and not across. Native Grass seed should be calculated figuring seed on a pure live seed basis (PLS), using the least amount of inert matter available. Seed and mulch to produce a uniform vegetation cover using the seeding rates as indicated to each application. Mulch with clean, weed free straw. Place straw to an approximate 2-inch loose depth (2 tons per acre) and anchor it into the soil by mechanically crimping it into the soil surface or applying tackifier to provide a protective cover. For the periods of March 1 through May 15 and from September 1 through November 1, the Department will allow the option of using hydromulch at minimum rate of 1,500 pounds per acre in place of straw with tackifier. Regardless of materials used, ensure the protective cover holds until seeding is acceptably established according to part G) of this subsection.</p>
SUBSECTION: REVISION:	213.03.01 Best Management Practices (BMP). Replace the second and third sentence of the first paragraph with the following: Include erosion control for all off right of way work performed under a Department acquired permit. Ensure that the BMP provides storage for 3,600 cubic feet of water per surface acre disturbed.
SUBSECTION: REVISION:	213.03.02 Progress Requirements. Add the following after the first sentence of the third paragraph: Seed and mulch areas at final grade within 14 days. Temporary mulch areas not at final grade if work stops for longer than 21 days. Temporary mulch soil stock piles within 14 days of the last construction activity in that area.
SUBSECTION: REVISION:	213.03.03 Inspection and Maintenance Replace both "0.1-inch" references with "0.5-inch". Add the following sentence to the end of the second paragraph: Initiate corrective action within 24 hours of any reported deficiency.
SUBSECTION: PART: REVISION:	213.03.05 Temporary Control Measures. B) Silt Checks. B) Silt Checks. Use one of the following types: 1) Silt Check Type II - Crushed stone such as cyclopean stone riprap, quarry run stone, or other size material approved by the Engineer, dumped in place and shaped to the configuration required. 2) Silt Check Type III - Blasted or broken rock dumped in place and shaped to the configuration required. Remove and properly dispose of sediment deposited at silt checks as necessary. When no longer needed, remove the silt checks and dispose of surplus materials as excavated materials according to Section 204. Seed and protect the entire area disturbed, as directed. Do not leave silt checks in place after completion of the project unless allowed by the Engineer or specified in the Plans.

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<p>SUBSECTION: 213.03.05 Temporary Control Measures. PART: F) Temporary Seeding and Protection. REVISION: Replace the first sentence with the following:</p>	<p>Apply seed mix Type I at a minimum application rate of 100 pounds per acre plus a nurse crop of either Cereal Rye or German Foxtail-Millet based on the time of year. During the months of June through August, apply 10 pounds of German Foxtail-Millet (<i>Setaria italica</i>). During the months of September through May, apply 56 pounds of Cereal Rye (<i>Secale cereale</i>). Obtain the Engineer's approval for the seed before use.</p>
<p>SUBSECTION: 213.03.05 Temporary Control Measures. PART: G) Temporary Mulch. REVISION: Replace the last sentence with the following:</p>	<p>Place temporary mulch to an approximate 2-inch loose depth (2 tons per acre) and apply tackifier.</p>
<p>SUBSECTION: 213.04.15 Temporary Silt Ditch. REVISION: Replace with the following:</p>	<p>The Department will measure the quantity in linear feet.</p>
<p>SUBSECTION: 213.04 MEASUREMENT. REVISION: Add the following Subsection:</p>	<p>213.04.24 Clean Temporary Silt Ditch. The Department will measure the quantity in linear feet along the ditch line.</p>
<p>SUBSECTION: 213.05 PAYMENT. REVISION: Add the following lines:</p>	<p>20594 Temporary Silt Ditch Linear Foot 20601 Clean Temporary Silt Ditch Linear Foot</p>
<p>SUBSECTION: 303.03.01 Mixture PART: C) Cement Treated Mixture. REVISION: Delete the "For asphalt pavements" from the second paragraph.</p>	
<p>SUBSECTION: 303.03.01 Mixture PART: C) Cement Treated Mixture. REVISION: Delete requirement "2".</p>	
<p>SUBSECTION: 401.02.01 All Asphalt Mixing Plants. REVISION: Replace the third paragraph and numbers 1) and 2) with the following:</p>	<p>When plants are in operation, the Department will require one computer on the site of operations for the purpose of recording and submitting test data. Ensure Microsoft Office 2003 Professional, full installation, is installed on the computer and used for data submittal.</p>
<p>SUBSECTION: 402.03.02 Acceptance. PART: D) Testing Responsibilities. NUMBER: 4) Density. REVISION: Replace the first sentence of the third paragraph with the following:</p>	<p>For surface mixtures placed on driving lanes and ramps, furnish 2 cores per subplot to the nearest laboratory facility (Contractor or Department lab) for density determination by the Engineer.</p>
<p>SUBSECTION: 402.03.02 Acceptance. PART: H) Unsatisfactory Work. NUMBER: 1) Based on Lab Data. REVISION: Replace the "AASHTO MP2" references in the second paragraph with "AASHTO M 323".</p>	
<p>SUBSECTION: 402.04 MEASUREMENT. REVISION: Replace the last sentence with the following:</p>	<p>The Department will not measure construction of rolled rumble strips or pavement wedge texturing for payment and will consider them incidental to the asphalt mixture.</p>

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SUBSECTION:	402.04.01 Weight.												
REVISION:	Replace first sentence of the second paragraph with the following: The Department will determine the bulk, oven-dry specific gravity for the fine and coarse aggregates according to KM64-605 and AASHTO T 85, respectively.												
SUBSECTION:	402.04.02 Thickness on New Construction.												
REVISION:	Delete the third paragraph and add the following at the end of the subsection: The Department will not measure initial thickness check coring or coring of corrective work for payment and will consider it incidental to the asphalt mixture.												
SUBSECTION:	402.05.02												
PARTS:	Lot Pay Adjustment Schedule, Compaction Option A, Base and Binder Mixtures Lot Pay Adjustment Schedule, Compaction Option A, Surface Mixtures Lot Pay Adjustment Schedule, Compaction Option B Mixtures												
REVISION:	Replace the VMA table with the following:												
<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th colspan="2">VMA</th> </tr> <tr> <th>Pay Value</th> <th>Deviation From Minimum</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.00</td> <td style="text-align: center;">≤ 0.5 below min. VMA</td> </tr> <tr> <td style="text-align: center;">0.95</td> <td style="text-align: center;">0.6-1.0 below min.</td> </tr> <tr> <td style="text-align: center;">0.90⁽²⁾</td> <td style="text-align: center;">1.1-1.5 below min.</td> </tr> <tr> <td style="text-align: center;">⁽¹⁾/₍₂₎</td> <td style="text-align: center;">> 1.5 below min.</td> </tr> </tbody> </table>		VMA		Pay Value	Deviation From Minimum	1.00	≤ 0.5 below min. VMA	0.95	0.6-1.0 below min.	0.90 ⁽²⁾	1.1-1.5 below min.	⁽¹⁾ / ₍₂₎	> 1.5 below min.
VMA													
Pay Value	Deviation From Minimum												
1.00	≤ 0.5 below min. VMA												
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0.90 ⁽²⁾	1.1-1.5 below min.												
⁽¹⁾ / ₍₂₎	> 1.5 below min.												
SUBSECTION:	403.03.03 Preparation of Mixture.												
PART:	A) Mixture Composition.												
REVISION:	Replace the “AASHTO MP2” reference in the first paragraph with “AASHTO M 323”. From the aggregate requirements list, delete 3) Type C.												
SUBSECTION:	403.03.03 Preparation of Mixture.												
PART:	C) Mix Design Criteria.												
REVISION:	Replace the “AASHTO MP2” references with “AASHTO M 323”. Replace the “AASHTO PP28” references in the second paragraph with “AASHTO R 35”.												
SUBSECTION:	403.03.03 Preparation of Mixture.												
PART:	C) Mix Design Criteria.												
NUMBER	1) Preliminary Mix Design.												
REVISION:	Add the following footnote to the table and associate it with the ESAL’s field “<0.3”: * For CL1 ASPH SURF 0.38D PG64-22 only.												
SUBSECTION:	403.03.06 Thickness Tolerances.												
PART:	B) New Construction.												
REVISION:	Replace the first paragraph with the following: Under the Engineer’s supervision, perform coring for thickness checks according to KM 64-420, as soon as practical after completion of all, or a major portion, of the asphalt base. The Engineer will measure the cores. Fill all core holes either with compacted asphalt mixture or non-shrink grout. Complete all remedial overlay work before placing the final course.												

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SUBSECTION: 403.03.08 Rumble Strips.
REVISION: Replace with the following:

403.03.08 Shoulder Rumble Strips and Pavement Wedge Texturing.

A) Shoulder Rumble Strips.

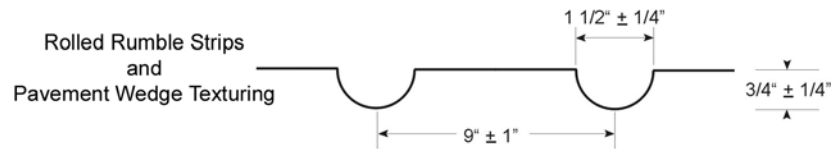
1) Interstates and Parkways. Construct sawed rumble strips on all mainline shoulders to the dimensions shown below. Do not place rumble strips on ramps.

2) Other Roads. Construct rolled rumble strips on shoulders of facilities with posted speed limits greater than 45 MPH. Unless specified in the plans or directed by the Engineer, do not construct rumble strips on facilities with posted speed limits of 45 MPH or less.

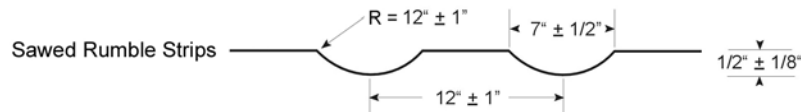
Construct rolled rumble strips on mainline shoulders to the dimensions shown below. On shoulders less than 3 feet wide, shorten the width and distance of the strips as the Engineer directs. Time the rolling operation so indentations are at the specified size and depth without causing unacceptable displacement of the asphalt mat. Correct unacceptable rolled rumble strips by sawing.

B) Pavement Wedge Texturing. Perform texturing on all pavement wedges constructed monolithically with the mainline or constructed using a surface mixture. When furnishing Asphalt Mixture for Pavement Wedge, binder, or a base mixture for the wedge, the Department will not require texturing.

Texture to the dimensions shown below. On wedges less than 3 feet, shorten the length and distance of the texturing as the Engineer directs. Time the rolling operation so indentations are at the specified size and depth without causing unacceptable displacement of the asphalt mat.



Place one foot out from the mainline pavement and to a width of 2 feet.



Place one foot out from the mainline pavement and to a width of 16 inches.

SUBSECTION: 403.04.03 Asphalt Mixtures.
REVISION: Replace the second sentence with the following:

The Department will not measure rolled rumble strips or pavement wedge texturing for payment and will consider them incidental to this bid item.

SUBSECTION: 403.04.07 Sawed Rumble Strips.
REVISION: Add the following subsection:

403.04.07 Sawed Rumble Strips. The Department will measure the quantity in linear feet. When rolled in rumble strips are specified, the Department will not measure sawed rumble strips for payment and will consider them incidental to the asphalt mixture.

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SUBSECTION:	403.05 PAYMENT						
REVISION:	Add the following bid item:						
	<table border="0"> <thead> <tr> <th align="left"><u>Code</u></th> <th align="left"><u>Pay Item</u></th> <th align="left"><u>Pay Unit</u></th> </tr> </thead> <tbody> <tr> <td>20362</td> <td>Shoulder Rumble Strips – Sawed</td> <td>Linear Foot</td> </tr> </tbody> </table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	20362	Shoulder Rumble Strips – Sawed	Linear Foot
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>					
20362	Shoulder Rumble Strips – Sawed	Linear Foot					
SUBSECTION:	501.03.20 Opening to Public Traffic.						
REVISION:	Delete the last sentence of the first paragraph.						
SUBSECTION:	501.03.21 Tolerance in Pavement Thickness.						
REVISION:	Add the following: Core the pavement as the Engineer directs.						
SUBSECTION:	501.04.06 Thickness.						
REVISION:	Add the following: The Department will not measure coring for payment and will consider it incidental to the concrete pay items.						
SUBSECTION:	502.03 CONSTRUCTION.						
PART:	C) Curing and Protecting Pavement.						
NUMBER:	3)						
REVISION:	Replace the last sentence with the following: The Department will allow permanent removal of the cover when the concrete attains the required opening strength of 3,000 psi.						
SUBSECTION:	502.03 CONSTRUCTION.						
PART:	D) Strength Testing and Opening to Traffic.						
NUMBER:	2) Testing.						
REVISION:	Replace the second paragraph with the following: When the average compressive strength is 3,000 psi, the Department will allow the pavement to be opened to traffic and will test the remaining sets of cylinders at the required age. When the average compressive strength is less than 3,000 psi at the required age, do not open the pavement to traffic until the pavement has been in place for 7 days. The Engineer may accept the pavement based on additional testing.						
SUBSECTION:	503.03.09 Ride Quality.						
REVISION:	Replace parts 5) and 6) with the following: 5) Perform corrective work to achieve the required IRI by regrinding the entire width of the traffic lane at areas having a high IRI. The Engineer may exclude pavement areas where grinding alone will not correct deficiency. 6) The Department will create a strip chart when the test results show that the IRI is greater than 60 or upon request for lower IRI values.						
SUBSECTION:	601.03.02 Concrete Producer Responsibilities.						
REVISION:	Replace the first sentence with the following: Use a concrete producer from the List of Approved Materials when the quantity of concrete delivered to the project in a plastic condition is 250 cubic yards or more. Ensure that the concrete producer complies with the following requirements:						

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SUBSECTION: 601.03.02 Concrete Producer Responsibilities. PART: C) Quality Control. REVISION: Replace the first paragraph with the following: Take full responsibility for the batch weight calculations and quality control of concrete mixtures at the plant. Ensure that the Level II concrete technician is present when work is in progress and is responsible for inspecting trucks, batch weight calculations, monitoring batching, making mixture adjustments, reviewing the slump, air content and unit weight tests, and monitoring the concrete temperature, all to provide concrete to the project conforming to specifications. A Level I concrete technician is responsible for testing production material for slump, entrained air, unit weight and temperature of the mixture. Ensure the technician performs all sampling and testing according to the appropriate Kentucky Methods. Delete the third paragraph.
SUBSECTION: 601.03.02 Concrete Producer Responsibilities. PART: F) Records. REVISION: Retain all concrete technician records, test results and batch tickets pertaining to concrete produced for a Department project for at least 3 years after formal acceptance of the project. Make all records available to the Engineer and the Contractor on the project for review upon request.
SUBSECTION: 601.03.02 Concrete Producer Responsibilities. PART: G) Mix Designs. REVISION: Replace the last sentence of the first paragraph with the following: Before producing any concrete for the project, submit a proposed mixture design to the Engineer and obtain the District Materials engineer's or the Central Office Material's approval. Submit the mix design electronically using Microsoft Office 2003 Professional, full installation, and the Concrete Mix Design Spreadsheet located on the Division of Materials Website.
SUBSECTION: 601.03.02 Concrete Producer Responsibilities. PART: G) Mix Designs. NUMBER: 1) New Mixture Designs. REVISION: Replace the first sentence with the following: Base the proposed mix design on standard Department methods unless the District Materials Engineer, or Central Office Materials approves otherwise.
SUBSECTION: 601.03.02 Concrete Producer Responsibilities. PART: G) Mix Designs. NUMBER: 1) New Mixture Designs. LETTER: b) REVISION: Replace the second sentence with the following: The District Materials Engineer or Central Office Materials will provide an average value of the specific gravity aggregate absorption.
SUBSECTION: 601.03.02 Concrete Producer Responsibilities. PART: G) Mix Designs. NUMBER: 1) New Mixture Designs. LETTER: g) REVISION: Replace the fourth and fifth sentence with the following: Central Office Materials will observe all phases of the trial batches. Have the producer submit a report containing mix proportions and test results for slump, air content, water/cement ratio, unit weight, and compressive strength for each trial batch to the Engineer for Central Office Materials review and approval.

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SUBSECTION: 601.03.02 Concrete Producer Responsibilities. PART: G) Mix Designs. NUMBER: 2) Approval. REVISION: Replace the first sentence with the following: The District Materials Engineer or Central Office Materials will base approval of the mixture design on the following criteria:
SUBSECTION: 601.03.02 Concrete Producer Responsibilities. PART: G) Mix Designs. NUMBER: 3) Changes in Approved Mix Designs. REVISION: Replace the first sentence with the following: Do not change the source of supply of the mixture ingredients without the District Materials Engineer's or Central Office Materials written permission. Replace the third sentence with the following: Upon the District Materials Engineer's or Central Office Materials written approval, the Department will allow the use of aggregate from the new source.
SUBSECTION: 601.03.03 Proportioning and Requirements. PART: A) Concrete. TABLE: INGREDIENT PROPORTIONS AND REQUIREMENTS FOR VARIOUS CLASSES OF CONCRETE REVISION: Under Class of Concrete replace "AAA ⁽⁹⁾ " with "AAA ⁽⁸⁾ "
SUBSECTION: 601.03.03 Proportioning and Requirements. PART: A) Concrete. FOOTNOTE: (6) REVISION: Add the following after the first sentence of the first paragraph: For products with voids, the slump may be increased to 7 inches. Replace the "0.3" requirement for Spring and Fall mix designs with "0.37".
SUBSECTION: 601.03.03 Proportioning and Requirements. PART: A) Concrete. FOOTNOTE: (7) REVISION: Replace with the following: The precast fabricator may increase the slump of Class A concrete to a maximum of 7 inches provided the fabricator uses a high range water reducer (Type F and G) and maximum water/cement ratio of 0.46.
SUBSECTION: 601.03.03 Proportioning and Requirements. PART: E) Measuring. NUMBER: 3) Water. REVISION: Delete the last sentence of the second paragraph.

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SUBSECTION: PART: NUMBER: REVISION:	601.03.03 Proportioning and Requirements. E) Measuring. 4) Measuring Admixtures. Replace with the following: 4) Measuring Admixtures. Introduce liquid admixtures into the concrete batch along with, or as part of, the mixing water. Keep air-entraining admixtures completely separate from all other admixtures until introduction into the batch. Maintain and equip dispensing equipment to ensure no chlorides are introduced into any Department mix. Use approved dispensing equipment with a meter, gauge, or scale that can accurately be pre-set for the needed amount of admixture and can consistently deliver quantities of admixture to successive batches at any setting with satisfactory accuracy. The dispensing equipment must be visible to the batch operator if the actual dispensed amounts are not recorded on the computer batch ticket. Ensure admixture dispensers are inspected, calibrated and certified every 6 months. The Department may allow admixtures to be added, to the truck, at the project site provided the Engineer's approval is obtained first.
SUBSECTION: REVISION:	601.03.04 Classes and Primary Uses. Add the following part: R) Dry Cast. Precast units.
SUBSECTION: REVISION:	601.03.05 Admixtures. Replace the last sentence of the fourth paragraph with the following: Store admixtures where the liquid temperatures can be maintained between 32 and 110 °F.
SUBSECTION: PART: REVISION:	601.03.09 Placing Concrete. D) Weather Limitations and Protection. Delete the last sentence of paragraph two.
SUBSECTION: REVISION:	605.03 CONSTRUCTION. Insert the following sentence after the first sentence: Ensure all non-composite box beam concrete contains an approved corrosion inhibitor from the List of Approved Materials.
SUBSECTION: REVISION:	605.03.03 Casting. Delete the first sentence in the first paragraph. Add the following after the first sentence of the third paragraph: Do not vibrate Self-Consolidating Concrete (SCC).
SUBSECTION: REVISION:	605.03.04 Tack welding. Replace the first sentence with the following: When tack welding steel reinforcement, use ASTM A 706 steel and conform to the following conditions.
SUBSECTION: NUMBER: REVISION:	605.03.04 Tack Welding. 3) Replace the first sentence with the following: Tack weld only at intersections of bars except do not tack weld in any bend or within 2 bar diameters of a bend.
SUBSECTION: NUMBER: REVISION:	605.03.04 Tack Welding. 5) Replace the last sentence with the following: Each sample must meet the minimum requirement for elongation, ductility, tensile and yield strength of the bar stock.

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SUBSECTION:	605.03.04 Tack Welding.
NUMBER:	6)
REVISION:	Delete the last sentence.
SUBSECTION:	605.03.04 Tack Welding.
REVISION:	Change footnote "(4) (d)" to "(5)"
SUBSECTION:	605.03.07 Removal of Forms and Surface Finish.
REVISION:	Add the following sentence before the last sentence of the paragraph: Finish dry cast products according to the Precast/Prestressed Concrete Manual.
SUBSECTION:	611.02.01 Concrete.
REVISION:	Replace with the following: Conform to Subsections 601.02 and 601.03 and the Precast/Prestress Concrete Manual.
SUBSECTION:	611.03.02 Precast Unit Construction.
REVISION:	Replace "AASHTO C 1433" with "ASTM C 1433"
SUBSECTION:	611.03.02 Precast Unit Construction.
NUMBER:	2)
REVISION:	Replace with the paragraph with the following: Mark all box culverts sections with the following information on the inside top of each section with letters no less than 2 inches high: <ul style="list-style-type: none"> a) Span, rise, maximum and minimum design earth cover, and KY Table 3. b) Date of manufacture. c) Name and trademark of the manufacturer. For entrance and exit box sections, indent the required information. Mark interior sections by indenting or with waterproof paint.
SUBSECTION:	701.02.05 Backfill Materials.
PART:	A) Granular Backfill.
NUMBER:	1)
REVISION:	Remove "A2" from the list of acceptable materials.
SUBSECTION:	701.03.03 Pipe Bedding.
REVISION:	Replace with the following: 701.03.03 Pipe Bedding. A) Reinforced Concrete Pipe. Construct bedding according to the Standard Drawings and this section. <ul style="list-style-type: none"> 1) Type 1 Installation. When working on a rock foundation, place bedding to a depth of 6 inches or equal to $Bc/12$, the pipe diameter in inches divided by 12, whichever is greater. For all other foundations, place a minimum of 4 inches of bedding. Shape the bedding to conform to the invert shape throughout the entire width and length of the proposed structure. Compact the bedding, but leave the center third of the pipe diameter ($Bc/3$) uncompacted. Place and compact additional bedding material in lifts 6 inches or less to an elevation of 0.30 the culvert diameter. 2) Type 4 Installation. When working on a rock foundation, place bedding to a depth of 6 inches or equal to $Bc/12$, the pipe diameter in inches divided by 12, whichever is greater. For all other foundations, place a minimum of 4 inches of bedding. B) Corrugated Metal, Thermoplastic, and Structural Plate Pipe. Place and compact bedding to provide 4 inches of bedding below the outside invert of the pipe after shaping. Shape the bedding to conform to the invert shape throughout the entire width and length of the proposed structure. Place and compact additional bedding material in lifts 6 inches or less to an elevation of 0.30 the culvert diameter.

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<p>SUBSECTION: 701.03.06 Initial Backfill. PART: A) Reinforced Concrete REVISION: Replace with the following:</p>	<p>A) Reinforced Concrete Pipe.</p> <ol style="list-style-type: none"> 1) Type 1 Installation. When the top of the pipe is not within one pipe diameter of the subgrade, backfill with granular backfill, additional bedding material, or flowable fill from the top of the bedding to an elevation equal to 1/2 the pipe diameter, and either granular backfill, flowable fill, or embankment material in 6-inch lifts to an elevation of one-foot above the pipe. 2) Type 4 Installation. Backfill from the top of the bedding with granular backfill, flowable fill, or embankment material in 6-inch lifts to an elevation of one-foot above the pipe. The Department will allow Type 4 installations for median drains and pipe installations located 35 feet or more from the edge of shoulder, back of curb, or any paved surface.
<p>SUBSECTION: 701.05 PAYMENT. REVISION: Replace bid item “2599 Fabric-Geotextile, Type IV Square Yard” with “21433ES214 Fabric-Geotextile, Type IV for Pipe Square Yard⁽²⁾”</p>	<p>Replace foot note “** The unit bid price is \$2.00 per square yard for Geotextile Fabric, Type III” with “⁽²⁾The unit price is \$2.00 per square yard for Fabric-Geotextile, Type IV for Pipe”</p>
<p>SUBSECTION: 710.02.15 Plastic Adjusting Rings. REVISION: Replace this section with:</p>	<p>710.02.15 Plastic or Rubber Adjusting Rings. Provide plastic or rubber adjusting rings that are on the Department’s List of Approved Materials.</p>
<p>SUBSECTION: 710.03.03 Adjusted Small Drainage Structures. REVISION: Replace the last sentence of the first paragraph:</p>	<p>For plastic or rubber adjusting rings, install and seal according to the manufacturer’s recommendations.</p>
<p>SUBSECTION: 711.02 MATERIALS. REVISION: Replace with the following:</p>	<p>Conform to the Contract requirements.</p>
<p>SUBSECTION: 713.03 CONSTRUCTION. REVISION: Add the following after the third paragraph:</p>	<p>Offset longitudinal lines at least 2 inches from longitudinal pavement construction joints. Offset longitudinal lane lines on multi-lane highways 2 inches towards the median.</p>
<p>SUBSECTION: 714.03.06 Proving Period for Durable Markings. PART: B) Failure. REVISION: Replace the first sentence with the following:</p>	<p>During the proving period, the Department will consider markings defective when the retroreflectivity falls below the minimum required or the material fails to meet the other requirements of A) above. Additionally, when more than 10 percent of any one-mile section or individual gore area is defective, the Department will consider the entire section defective.</p>
<p>SUBSECTION: 716.03.08 Testing. REVISION: Replace “10 megohms” with “100 megohms”</p>	
<p>SUBSECTION: 721.03 CONSTRUCTION. REVISION: Replace the third paragraph with the following:</p>	<p>Install fence 18 inches inside the right-of-way line or in other locations specifically indicated.</p>
<p>SUBSECTION: 723.03 CONSTRUCTION. REVISION: Replace the first sentence of the fourth paragraph with the following:</p>	<p>Set right-of-way markers within 12 inches of the right-of-way line.</p>

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SUBSECTION:	724.02.01 Plants.
REVISION:	Replace the reference “American Association of Nurserymen” with “American Nursery and Landscape Association”.
SUBSECTION:	801.01 REQUIREMENTS.
REVISION:	Add the following sentence after the third sentence of the first paragraph: Mills must request and be approved by the Department to supply cement with an SO ₃ content above the value in Table 1 of ASTM C 150.
SUBSECTION:	804.01.03 Conglomerate Sand.
REVISION:	Replace second sentence of the paragraph with the following: Conglomerate sand may include some material which has been produced by crushing larger pieces of the parent material.
SUBSECTION:	804.02 Approval.
REVISION:	Replace first sentence of the second paragraph with the following: The Department will consider a source for inclusion on the Aggregate Source List when the aggregate producer complies with KM 64-608 and provides the following:
SUBSECTION:	804.03 Concrete.
REVISION:	Second sentence in first paragraph should be a separate paragraph immediately following the first and should read as follows: Provide natural, crushed, or conglomerate sand. The Department will allow any combination of natural, crushed, or conglomerate sand when the combination is achieved in the concrete plant weigh hopper. The Engineer may allow other sands. Use natural or conglomerate sands as fine aggregates in concrete intended as a wearing surface for traffic. Conform to the following:
SUBSECTION:	804.04.03 Polish-Resistant Aggregate.
REVISION:	Add the following paragraph: Provide a signed certification from the aggregate producer for the manufactured polish-resistant fine aggregate stating that the aggregate is supplied from the approved parent material as found on the Department’s List of Approved Materials, Polish-Resistant Aggregate Source List and Guidelines on the Division of Materials’ webpage.
SUBSECTION:	804.04.04 Requirements for Combined Aggregates.
PART:	D) Absorption.
REVISION:	Delete the first sentence and replace the second sentence with the following: Provide total combined fine aggregates having a water absorption of no more than 4.0 percent.
SUBSECTION:	804.11 Sampling and Testing.
REVISION:	For Absorption (Fine Aggregate), replace method “AASHTO T 84” with “KM 64-605”
SUBSECTION:	805.02 Approval.
REVISION:	Replace first sentence of the second paragraph with the following: The Department will consider a source for inclusion on the Aggregate Source List when the aggregate producer complies with KM 64-608 and provides the following:

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SUBSECTION:	805.04.01 JPC Base, JPC Pavement, JPC Shoulders, and Concrete for Bridge Decks.
REVISION:	Replace the subsection heading and first sentence with the following: 805.04.01 JPC Base, JPC Pavement, JPC Shoulders, Concrete for Bridge Decks, and Precast Products. Add the following paragraph: Provide a signed certification from the aggregate producer for the approved freeze-thaw coarse aggregate stating that the aggregate is supplied from the approved parent material as found on the Department's List of Approved Materials and Concrete Aggregate Restriction List.
SUBSECTION:	805.04.01 JPC Base, JPC Shoulders, and Concrete for Bridge Decks.
PART:	3)
REVISION:	Replace the "tests" with "test" in the last sentence.
SUBSECTION:	805.05.05 Polish-Resistant Aggregate.
REVISION:	Add the following paragraph: Provide a signed certification from the aggregate producer for the manufactured polish-resistant coarse aggregate stating that the aggregate is supplied from the approved parent material as found on the Department's List of Approved Materials, Polish-Resistant Aggregate Source List and Guidelines on the Division of Materials' webpage.
SUBSECTION:	805.13.01 Cyclopean Stone Riprap and Channel Lining Class III.
REVISION:	Replace the subsection with the following: 805.13.01 Cyclopean Stone Riprap and/or Channel Lining Class III. Provide material meeting the general requirements of Section 805. Ensure that 100 percent passes through a square opening of 16 inches by 16 inches, and no more than 20 percent passes through square openings of 8 inches by 8 inches. The Department may allow stones of smaller sizes for filling voids in the upper surface and dressing to the proper slope.
SUBSECTION:	806.03.01 General Requirements.
TEST:	Dynamic Shear
REVISION:	Replace the 100% pay range "5,000-5,500" with "0-5,500"
SUBSECTION:	806.03.03 Modification.
REVISION:	Replace the first sentence with the following: Use only styrene-butadiene (SB) or styrene-butadiene-styrene (SBS) modifiers.
SUBSECTION:	810.02 APPROVAL.
REVISION:	Replace reference "KM 114" with "KM 115".
SUBSECTION:	810.03.06 Identification and Markings.
REVISION:	Delete the following text from the first paragraph: "When the manufacturer has more than one plant, include the plant letter assigned by the Division of Materials after the date of manufacture as follows: L-Louisville N-London" Delete the following paragraph: "The Department will not require the certification on the shipment approval form to be notarized. The Department will not require the information under "Pipe Data" on the approval form when the manufacture's shipment ticket is attached and contains the necessary information."

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SUBSECTION: 811.02.01 Requirements. REVISION: Replace the subsection with the following: Furnish bar reinforcement for bridges, cast-in-place culverts, and cast-in-place retaining walls that conforms to ASTM A 615 (billet) or ASTM A 996 (rail). ASTM A 706 steel is acceptable with prior approval of the Division of Materials. Do not weld any steel bar reinforcement unless it is ASTM A 706 rebar. The Engineer will accept rail steel bar reinforcement in straight lengths only. Do not use rail steel reinforcement where field bending is allowed or required.
SUBSECTION: 811.09.02 Dowel Bars. REVISION: Replace the reference to "ASTM A 616" with "ASTM A 996" Insert the following sentence between the third and fourth sentence of the first paragraph: Broken or sheared ends are acceptable with prior approval of the Division of Materials.
SUBSECTION: 811.06 BAR MATS. REVISION: Replace the subsection with the following: Conform to ASTM A 184 and fabricate by welding deformed Grade 60 weldable bars.
SUBSECTION: 811.09.02 Dowel Bars. REVISION: Replace the first paragraph with the following: Furnish dowel bars that are plain round bars conforming to ASTM A 706, A 615, A 996, or A 617 with respect to mechanical properties only. Provide either Grade 40, 50 or 60 steel. Saw cut the free ends of the dowels and ensure that they are free of burrs or projections. Broken or sheared ends are acceptable with prior approval of the Division of Materials. Coat dowel bars according to AASHTO M 254 with the following exceptions for Type B coatings:
SUBSECTION: 811.10.02 Epoxy Coating Material. REVISION: Replace both the reference to "ASTM D 3963 Annex" and "ASTM D 3963" with "AASHTO M 284".
SUBSECTION: 812.01.02 Hot-Rolled Carbon Steel Sheets and Strip of Structural Quality, Grade 33 (Corrugated Steel Plank for Bridge Floors). REVISION: Replace the reference to "ASTM A 570" with "ASTM A 1011"

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SUBSECTION: 827.04 SEED.

REVISION: Replace with the following:

827.04 SEED. Conform to the requirements outlined in the “Kentucky Seed Law and Provisions for Seed Certification in Kentucky” and the “Regulations under the Kentucky Seed Law”, with following exceptions:

- 1) Obtain seed only through registered dealers that are permitted for labeling of seed.
- 2) Ensure all deliveries and shipments of premixed seed are accompanied with a master blend sheet.
- 3) Ensure all bags and containers have an acceptable seed tag attached.
- 4) The Department may sample the seed at the job site at any time.

Do not use seed (grasses, native grasses, and legumes) if the weed seed is over one percent, total germination (including hard seed) is less than 80 percent, if the seed test date is over 9 months old exclusive of the month tested, or if the limits of noxious weed seed is exceeded.

Ensure that noxious weed seeds contained in any seed or seed mixture does not exceed the maximum permitted rate of occurrence per pound.

<u>Name of Kind</u>	<u>Max. No. Seeds (per pound)*</u>
Balloon Vine (<i>Cardiospermum halicacabum</i>)	0
Purple Moonflower (<i>Ipomoea turbinata</i>)	0
Canada Thistle (<i>Cirsium Arvense</i>)	0
Johnsongrass (<i>Sorghum halepense</i> and <i>Sorghum almum</i> and perennial rhizomatous derivatives of these species)	0
Quackgrass (<i>Elytrigia Repens</i>)	0
Annual Bluegrass (<i>Poa annua</i>)	120
Buckhorn Plantain (<i>Plantago lanceolata</i>)	120
Corncockle (<i>Agrostemma githago</i>)	18
Dodder (<i>Cuscuta</i> spp.)	18
Giant Foxtail (<i>Setaria faberii</i>)	18
Oxeye Daisy (<i>Chrysanthemum leucanthemum</i>)	120
Sorrel (<i>Rumex acetosella</i>)	120
Wild Onion and Wild Garlic (<i>Allium</i> spp.)	18

* Seed or seed mixtures that contain in excess of 120 total noxious seeds per pound is prohibited

Wildflower seed shall not be planted until approved by the MCL.

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REQUIREMENTS FOR SEEDS			
	Purity (Min. %)	Germination (Min. %) Including Hard Seed and Dormant Seed	Hard Seed (Max. %) Allowed in Germination
Grasses			
Bentgrass (<i>Argrostis palustris</i>)	98	85	-
Bermudagrass, common (<i>Cynodon dactylon</i>)	97	85	-
Bluegrass, Kentucky (<i>Poa pratensis</i>)	98	85	-
Brome, smooth (<i>Bromus inermis</i>)	95	80	-
Canarygrass, reed (<i>Phalaris arundinacea</i>)	95	80	-
Fescue, chewings (<i>Festuca rubra</i> var. <i>commutata</i>)	97	85	-
Fescue, hard (<i>Festuca trachyphlla</i>)	97	85	-
Fescue, meadow (<i>Festuca elatior</i>)	97	85	-
Fescue, red (<i>Festuca rubra</i>)	97	85	-
Fescue, tall (<i>Festuca arundinacca</i>)	97	85	-
Orchardgrass (<i>Dactylis glomerata</i>)	97	85	-
Redtop (<i>Agrostic alba</i>)	95	80	-
Ryegrass, annual, common or Italian (<i>Lotium multiflorum</i>)	97	85	-
Ryegrass, perennial (<i>Lolium perenne</i>)	97	85	-
Lovegrass, Weeping (<i>Eragrostic curvula</i>)	96	80	-
Oat (<i>Avena Sativa</i>)	98	85	-
Rye (<i>Secale cereale</i>)	98	85	-
Timothy (<i>Phleum pratense</i>)	98	85	-
Wheat, common (<i>Triticum aestivum</i>)	98	85	-
Legumes			
Alfalfa (<i>Medicago sativa</i>)	98	85	25
Clover, alsike (<i>Trifolium hybridum</i>)	97	85	25
Clover, ladino (<i>Trifolium repens</i>)	98	85	25
Clover, white (<i>Trifolium repens</i>)	98	85	25
Crownvetch (<i>Coronilla varia</i>)	97	85	25
Lespedeza, Korean (<i>Lespedeza stipulacea</i>)	97	85	20
Lespedeza, Sericea (<i>Lespedeza cuneata</i>)	97	85	20
Sweetclover, white (<i>Melilotus alba</i>)	98	85	25
Sweetclover, yellow (<i>Melilotus officinalis</i>)	98	85	25
Trefoil, birdsfoot (<i>Lotus corniculatus</i>)	97	85	25
Native Grasses			
Little Bluestem (<i>Schizachyrium scoparium</i>)	85	80	-
Big Blustem (<i>Andropogon gerardii</i>)	85	80	-
Indian Grass (<i>Sorghastrum nutans</i>)	85	80	-
Switchgrass (<i>Panicum virgatum</i>)	85	80	-

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<p>SUBSECTION: 827.07 EROSION CONTROL BLANKET. REVISION: Replace the subsection with the following:</p> <p>827.07 EROSION CONTROL BLANKET. Use a blanket from the Department's List of Approved Materials. Blankets must be machine constructed with two-sided netting filled with curled wood fiber mat, straw, or a straw and coconut fiber combination. Ensure the blanket is smolder resistant without the use of chemical additives.</p> <p>A) Dimensions. Furnish in strips with a minimum width of 4 feet and length of 50 feet. B) Weight.</p> <p>1) Curled Wood Fiber. Ensure a minimum mass per unit area of 7.25 ounce per square yard according to ASTM D 6475. 2) Straw. Ensure a minimum mass per unit area of 7.5 ounce per square yard according to ASTM D 6475. 3) Straw/Coconut Fiber. Ensure a minimum mass per unit area of 6.75 pounds per square yard according to ASTM D 6475.</p> <p>C) Fill. Ensure the fill is evenly distributed throughout the blanket.</p> <p>1) Curled Wood Fiber. Use curled wood fiber of consistent thickness with at least 80 percent of its fibers 6 inches or longer in length. 2) Straw. Use only weed free agricultural straw. 3) Straw/Coconut Fiber. Conform to the straw requirements above and ensure the coconut fiber is evenly distributed throughout the blanket and accounts for 30% or more of the fill.</p> <p>D) Netting. Use photodegradable extruded plastic mesh or netting, with a maximum spacing width of one inch square, on both sides of the blanket. Secure the netting by stitching or other method to ensure the blanket retains its integrity. E) Staples. Use steel wire U-shaped staples with a minimum diameter of 0.09 inches (11 gauge), a minimum width of one inch, and a minimum length of 6 inches. Use a heavier gauge when working in rocky or clay soils and longer lengths in sandy soils. Provide staples with colored tops when requested by the Engineer. F) Performance.</p> <p>1) C-Factor. Ensure the ratio of soil loss from protected slope to ratio of soil loss from unprotected is ≤ 0.15 for a slope of 3:1 when tested according to ECTC method 2. 2) Shear Stress. Ensure the blanket can sustain a minimum shear stress of 1.75 pounds per square foot without physical damage or excess erosion (> 0.5 inches soil loss) when tested according to ECTC Method 3.</p>
<p>SUBSECTION: 828.02 APPROVAL. REVISION: Add the following:</p> <p>The Department will continue to include the masonry coatings on the list contingent upon receiving an annual certification containing the following information:</p> <p>1) A statement that the masonry coating to be furnished during the particular calendar year is of the same composition as that previously approved for inclusion on the approved list. 2) A statement that the masonry coating conforms to the appropriate requirements of the Kentucky Standard Specifications for Road and Bridge Construction. 3) A statement that notification will be made to the Division of Materials of any changes in composition for review and approval before furnishing the material to projects.</p>
<p>SUBSECTION: 843.01.02 Acceptance Procedures for Non-Specification Fabric. TABLE: GRAB STRENGTH PAYMENT REDUCTION REVISION: Add the following note:</p> <p>The Department will use the lowest value of MACHINE and CROSS for the reduction calculation.</p>

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SUBSECTION: 844.02.01 Fly Ash. PART: 1) REVISION: Delete the last sentence.
SUBSECTION: 844.02.01 Fly Ash. REVISION: Replace the subsection with the following: 844.02.01 Fly Ash. Select from the Department's List of Approved Materials for fly ash sources. To be placed on the list, furnish samples and ASTM C 618 test data developed over the previous 3 months, and confirm to the requirements in KM 64-325.

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

TRANSPORTATION CABINET DEPARTMENT OF HIGHWAYS

LABOR AND WAGE REQUIREMENTS APPLICABLE TO OTHER THAN FEDERAL-AID SYSTEM PROJECTS

- I. Application
- II. Nondiscrimination of Employees (KRS 344)
- III. Payment of Predetermined Minimum Wages
- IV. Statements and Payrolls

I. APPLICATION

1. These contract provisions shall apply to all work performed on the contract by the contractor with his own organization and with the assistance of workmen under his immediate superintendence and to all work performed on the contract by piecework, station work or by subcontract. The contractor's organization shall be construed to include only workmen employed and paid directly by the contractor and equipment owned or rented by him, with or without operators.

2. The contractor shall insert in each of his subcontracts all of the stipulations contained in these Required Provisions and such other stipulations as may be required.

3. A breach of any of the stipulations contained in these Required Provisions may be grounds for termination of the contract.

II. NONDISCRIMINATION OF EMPLOYEES

AN ACT OF THE KENTUCKY
GENERAL ASSEMBLY TO PREVENT
DISCRIMINATION IN EMPLOYMENT
KRS CHAPTER 344
EFFECTIVE JUNE 16, 1972

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy). The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, disability or age (between forty and seventy), except that such notice or advertisement may indicate a preference, limitation, or specification based on religion, or national origin when religion, or national origin is a bona fide occupational qualification for employment.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual

because of his race, color, religion, national origin, sex, disability or age (between forty and seventy), in admission to, or employment in any program established to provide apprenticeship or other training.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

III. PAYMENT OF PREDETERMINED MINIMUM WAGES

1. These special provisions are supplemented elsewhere in the contract by special provisions which set forth certain predetermined minimum wage rates. The contractor shall pay not less than those rates.

2. The minimum wage determination schedule shall be posted by the contractor, in a manner prescribed by the Department of Highways, at the site of the work in prominent places where it can be easily seen by the workers.

IV. STATEMENTS AND PAYROLLS

1. All contractors and subcontractors affected by the terms of KRS 337.505 to 337.550 shall keep full and accurate payroll records covering all disbursements of wages to their employees to whom they are required to pay not less than the prevailing rate of wages. Payrolls and basic records relating thereto will be maintained during the course of the work and preserved for a period of one (1) year from the date of completion of this contract.

2. The payroll records shall contain the name, address and social security number of each employee, his correct classification, rate of pay, daily and weekly number of hours worked, itemized deductions made and actual wages paid.

3. The contractor shall make his daily records available at the project site for inspection by the State Department of Highways contracting office or his authorized representative.

Periodic investigations shall be conducted as required to assure compliance with the labor provisions of the contract. Interrogation of employees and officials of the contractor shall be permitted during working hours.

Aggrieved workers, Highway Managers, Assistant District Engineers, Resident Engineers and Project Engineers shall report all complaints and violations to the Division of Contract Procurement.

The contractor shall be notified in writing of apparent violations. The contractor may correct the reported violations and notify the Department of Highways of the action taken or may request an informal hearing. The request for hearing shall be in writing within ten (10) days after receipt of the notice of the reported violation. The contractor may submit

records and information which will aid in determining the true facts relating to the reported violations.

Any person or organization aggrieved by the action taken or the findings established as a result of an informal hearing by the Division of Contract Procurement may request a formal hearing.

4. The wages of labor shall be paid in legal tender of the United States, except that this condition will be considered satisfied if payment is made by a negotiable check, on a solvent bank, which may be cashed readily by the employee in the local community for the full amount, without discount or collection charges of any kind. Where checks are used for payments, the contractor shall make all necessary arrangements for them to be cashed and shall give information regarding such arrangements.

5. No fee of any kind shall be asked or accepted by the contractor or any of his agents from any person as a condition of employment on the project.

6. No laborers shall be charged for any tools used in performing their respective duties except for reasonably avoidable loss or damage thereto.

7. Every employee on the work covered by this contract shall be permitted to lodge, board, and trade where and with whom he elects and neither the contractor nor his agents, nor his employees shall directly or indirectly require as a condition of employment that an employee shall lodge, board or trade at a particular place or with a particular person.

8. Every employee on the project covered by this contract shall be an employee of either the prime contractor or an approved subcontractor.

9. No charge shall be made for any transportation furnished by the contractor or his agents to any person employed on the work.

10. No individual shall be employed as a laborer or mechanic on this contract except on a wage basis, but this shall not be construed to prohibit the rental of teams, trucks or other equipment from individuals.

No Covered employee may be employed on the work except in accordance with the classification set forth in the schedule mentioned above; provided, however, that in the event additional classifications are required, application shall be made by the contractor to the Department of Highways and (1) the Department shall request appropriate classifications and rates from the proper agency, or (2) if there is urgent need for additional classification to avoid undue delay in the work, the contractor may employ such workmen at rates deemed comparable to rates established for similar classifications provided he has made written application through the Department of Highways, addressed to the proper agency, for the supplemental rates. The contractor shall retroactively adjust, upon receipt of the supplemental rates schedule, the wages of any employee paid less than the established rate and may adjust the wages of any employee overpaid.

11. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic in any work-week in which he is employed on such work, to work in excess of eight hours in any calendar day or in excess of forty hours in such work-week unless such laborer or mechanic receives compensation at a rate not less than one and one half times his basic rate of pay for all hours worked in excess of eight hours in any calendar day or in excess of forty hours in such work-week. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. This agreement shall be in writing and shall be executed prior to the employee working in excess of eight (8) hours, but not more than ten (10) hours, in any one (1) calendar day.

12. Payments to the contractor may be suspended or withheld due to failure of the contractor to pay any laborer or

mechanic employed or working on the site of the work, all or part of the wages required under the terms of the contract. The Department may suspend or withhold payments only after the contractor has been given written notice of the alleged violation and the contractor has failed to comply with the wage determination of the Department of Highways.

13. Contractors and subcontractors shall comply with the sections of Kentucky Revised Statutes, Chapter 337 relating to contracts for Public Works.

Revised 2-16-95

EXECUTIVE BRANCH CODE OF ETHICS

In the 1992 regular legislative session, the General Assembly passed and Governor Brereton Jones signed Senate Bill 63 (codified as KRS 11A), the Executive Branch Code of Ethics, which states, in part:

KRS 11A.040 (6) provides:

No present or former public servant shall, within six (6) months of following termination of his office or employment, accept employment, compensation or other economic benefit from any person or business that contracts or does business with the state in matters in which he was directly involved during his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved in state government. This subsection shall not prohibit the performance of ministerial functions, including, but not limited to, filing tax returns, filing applications for permits or licenses, or filing incorporation papers.

KRS 11A.040 (8) states:

A former public servant shall not represent a person in a matter before a state agency in which the former public servant was directly involved, for a period of one (1) year after the latter of:

- a) The date of leaving office or termination of employment; or
- b) The date the term of office expires to which the public servant was elected.

This law is intended to promote public confidence in the integrity of state government and to declare as public policy the idea that state employees should view their work as a public trust and not as a way to obtain private benefits.

If you have worked for the executive branch of state government within the past six months, you may be subject to the law's prohibitions. The law's applicability may be different if you hold elected office or are contemplating representation of another before a state agency.

Also, if you are affiliated with a firm which does business with the state and which employs former state executive-branch employees, you should be aware that the law may apply to them.

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, Room 136, Capitol Building, 700 Capitol Avenue, Frankfort, Kentucky 40601; telephone (502) 564-7954.

Kentucky Equal Employment Opportunity Act of 1978

The requirements of the Kentucky Equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) shall apply to this Contract. The apparent low Bidder will be required to submit EEO forms to the Division of Construction Procurement, which will then forward to the Finance and Administration Cabinet for review and approval. No award will become effective until all forms are submitted and EEO/CC has certified compliance. The required EEO forms are as follows:

- EEO-1: Employer Information Report
- Affidavit of Intent to Comply
- Employee Data Sheet
- Subcontractor Report

These forms are available on the Finance and Administration's web page under ***Vendor Information, Standard Attachments and General Terms*** at the following address:
<https://www.eProcurement.ky.gov>.

Bidders currently certified as being in compliance by the Finance and Administration Cabinet may submit a copy of their approval letter in lieu of the referenced EEO forms.

For questions or assistance please contact the Finance and Administration Cabinet by email at **finance.contractcompliance@ky.gov** or by phone at 502-564-2874.

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

HIGHWAY BASIC HOURLY RATES	FRINGE BENEFIT PAYMENTS COMBINED
<u>CRAFTS:</u>	
Breckinridge County:	
Bricklayers	25.90.....10.70
Bullitt, Carroll, Grayson, Hardin, Henry, Jefferson, Larue, Marion, Meade, Nelson, Oldham, Shelby, Spencer and Trimble Counties:	
Bricklayers	22.93.....8.85
Bracken, Gallatin, Grant, Mason and Robertson Counties:	
Bricklayers	25.86.....9.49
Boyd, Carter, Elliott, Fleming, Greenup, Lewis and Rowan Counties:	
Bricklayers	25.49.....13.86
Anderson, Bath, Bourbon, Boyle, Clark, Fayette, Franklin, Harrison, Jessamine, Madison, Mercer, Montgomery, Nicholas, Owen, Scott, Washington and Woodford Counties:	
Bricklayers	22.93.....8.85
Bricklayers (Layout Men)	23.18.....8.85
Refractory/Acid Brick/Glass	23.43.....8.85
All Counties	
Carpenters:	23.60.....8.97
Divers	35.78.....8.97
Piledrivermen	23.85.....8.97
Bracken and Grant Counties:	
Millwrights.....	21.90.....7.92
Anderson, Bath, Bourbon, Boyle, Clark, Fayette, Franklin, Harrison, Jessamine, Madison, Mercer, Montgomery, Nicholas, Owen, Scott and Woodford Counties:	
Millwrights.....	21.75.....12.50
Boyd, Carter, Elliott, Fleming, Greenup, Lewis, Mason, Robertson, and Rowan Counties:	
Millwrights.....	29.25.....12.16
Breckinridge, Bullitt, Carroll, Gallatin, Grayson, Hardin, Henry, Jefferson, Larue, Marion, Meade, Nelson, Oldham, Shelby, Spencer, Trimble and Washington Counties:	
Millwrights.....	23.65.....14.22
Bracken, Gallatin and Grant Counties:	
Electricians.....	24.24.....9.34
Sound Communications:	
CablePuller.....	9.00.....2.64
Installer.....	18.00.....3.475

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

HIGHWAY BASIC HOURLY RATES	FRINGE BENEFIT PAYMENTS COMBINED
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CRAFTS: (continued)

Boyd, Carter, Elliott and Rowan Counties:

Electricians:

Cable Splicers	27.46	16.12
Electricians	26.15	16.08

Anderson, Bath, Bourbon, Boyle, Breckinridge, Bullitt, Carroll, Clark, Fayette, Franklin, Grayson, Hardin, Harrison, Henry, Jefferson, Jessamine, Larue, Madison, Marion, Meade, Mercer, Montgomery, Nelson, Nicholas, Oldham, Owen, Robertson, Scott, Shelby, Spencer, Trimble, Washington and Woodford Counties:

Electricians.....	25.91	23.5% + 4.55
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Fleming, Greenup, Lewis and Mason Counties:

Electricians.....	27.94	11.35
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Bourbon (Northern third, including Townships of Jackson, Millersburg, Ruddel Mills & Shawhan); Carroll (Eastern third, including the Township of Ghent); Fleming (Western part, excluding Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksville, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford); Mason (Western two-thirds, including Townships of Dover, Lewisburg, Mays Lick, Maysville, Minerva, Moranburg, Murphysville, Ripley, Sardis, Shannon, South Ripley & Washington);

Nicholas (Townships of Barefoot, Barterville, Carlisle, Ellisville, Headquarters, Henryville, Morningglory, Myers & Oakland Mills); Owen (Townships of Beechwood, Bromley, Fairbanks, Holbrook, Jonesville, Long Ridge, Lusby's Mill, New, New Columbus, New Liberty, Owenton, Poplar Grove, Rockdale, Sanders, Teresita & Wheatley); Scott (Northern two-thirds, including Townships of Biddle, Davis, Delaplain, Elmville, Longlick, Muddy Ford, Oxford, Rogers Gap, Sadieville, Skinnersburg & Stonewall) & Bracken, Gallatin, Grant, Harrison & Robertson Counties:

Ironworkers:

Fence Erector	22.52	15.35
Structural.....	25.02	15.35

Bourbon (Southern two-thirds, including Townships of Austerlity, Centerville, Clintonville, Elizabeth, Hutchison, Little Rock, North Middletown & Paris); Carroll (Western two-thirds, including Townships of Carrollton, Easterday, English, Locust, Louis, Prestonville & Worthville); Clark (Western two-thirds, including Townships of Becknerville, Flanagan, Ford, Pine Grove, Winchester & Wyandotte); Owen (Eastern eighth, including Townships of Glenmary, Gratz, Monterey, Perry Park & Tacketts Mill); Scott (Southern third, including Townships of Georgetown, Great Crossing, Newtown, Stamping Ground & Woodlake); Anderson, Boyle, Breckinridge, Bullitt, Fayette, Franklin, Grayson, Hardin, Henry, Jefferson,

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

HIGHWAY BASIC HOURLY RATES	FRINGE BENEFIT PAYMENTS COMBINED
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CRAFTS: (continued)

Jessamine, Larue, Madison, Marion, Meade, Mercer, Nelson, Oldham, Shelby, Spencer, Trimble, Washington & Woodford Counties:

Ironworkers23.49.....15.99

Bourbon (Northern third, including Townships of Jackson, Millersburg, Ruddel Mills & Shawhan); Carroll (Eastern third, including the Townships of Ghent); Fleming (Western part, excluding Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksrige, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford); Mason (Western two-thirds, including Townships of Dover, Lewisburg, Mays Lick, Maysville, Minerva, Moranburg, Murphysville, Ripley, Sardis, Shannon, South Ripley & Washington); Nicholas (Townships of Barefoot, Barterville, Carlisle, Ellisville, Headquarters, Henryville, Morningglory, Myers & Oakland Mills); Owen (Townships of Beechwood, Bromley, Fairbanks, Holbrook, Jonesville, Long Ridge, Lusby's Mill, New, New Columbus, New Liberty, Owenton, Poplar Grove, Rockdale, Sanders, Teresita & Wheatley); Scott (Northern two-thirds, including Townships of Biddle, Davis, Delaplain, Elmville, Longlick, Muddy Ford, Oxford, Rogers Gap, Sadieville, Skinnersburg & Stonewall); Bracken, Gallatin, Grant, Harrison & Robertson Counties:

Ironworkers:

Up to and including 30- mile radius of Hamilton County, Ohio Courthouse23.70.....14.00

Beyond 30- mile radius of Hamilton County, Ohio Courthouse23.95.....14.00

Clark (Eastern third, including Townships of Bloomingdale, Hunt, Indian Fields, Kiddville, Loglick, Rightangele & Thomson); Fleming (Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksrige, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford); Mason (Eastern third, including Townships of Helena, Marshall, Orangeburg, Plumville & Springdale); Nicholas (Eastern eighth, including the Township of Moorefield Sprout); Bath, Boyd, Carter, Elliott, Greenup, Lewis, Montgomery & Rowan Counties:

Ironworkers:

Zone 126.8715.82

Zone 227.2715.82

Zone 328.8715.82

Zone 1 - Up to 10 mi. radius of union hall, Ashland, KY, 1643 Greenup Avenue;

Zone 2 - 10 to 50 mi. radius of union hall;

Zone 3 - 50 mi. radius and beyond.

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

HIGHWAY BASIC HOURLY RATES	FRINGE BENEFIT PAYMENTS COMBINED
<u>CRAFTS:</u> (continued)	
Anderson, Breckinridge, Bullitt, Carroll, Grayson, Hardin, Henry, Jefferson, Larue, Marion, Meade, Nelson, Oldham, Shelby, Spencer, Trimble and Washington Counties:	
Painters:	
Brush & Roller	17.879.07
Spray, Sand Blast, Power Tools, Water Blast & Steam Cleaning	18.629.07
Bracken, Gallatin, Grant, Mason, and Owen Counties:	
Painters:	
(Heavy and Highway Bridges- Guardrails-Lightpoles-Striping):	
Bridge/Equipment Tender and Containment Builder	20.406.30
Brush and Roller	23.006.30
Elevated Tanks; Steeplejack Work; Bridge & Lead Abatement	
24.00	6.30
Sand Blasting & Water Blasting	
23.75	6.30
Spray	23.506.30
Bath, Bourbon, Boyle, Clark, Fayette, Fleming, Franklin, Harrison, Jessamine, Madison, Mercer, Montgomery, Nicholas, Robertson, Scott and Woodford Counties	
Painters:	
Brush & Roller	21.305.90
Elevated Tanks; Steeplejack Work; Bridge & Lead Abatement	
22.30	5.90
Sandblasting & Waterblasting	22.055.90
Spray	21.805.90
Bridge/Equipment Tender and/or Containment Builder	
18.90	5.90
Boyd, Carter, Elliott, Greenup, Lewis and Rowan Counties	
Painters:	
Bridges	24.9310.90
All Other Work	20.3810.90

**TRANSPORTATION CABINET
 DIVISION OF CONSTRUCTION PROCUREMENT
 COMPLIANCE SECTION
 PROJECT WAGE RATES**

HIGHWAY BASIC HOURLY RATES	FRINGE BENEFIT PAYMENTS COMBINED
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CRAFTS: (continued)

Breckinridge, Bullitt, Carroll (Western Half), Franklin (Western three-fourths), Grayson, Hardin, Henry, Jefferson, Larue, Marion, Meade, Nelson, Oldham, Shelby, Spencer, Trimble and Washington Counties:

Plumber 27.20 12.47

Boyd, Carter, Elliott, Greenup, Lewis and Rowan Counties:

Plumbers and Steamfitters 24.61 15.98

Bracken, Carroll (Eastern Half), Gallatin, Grant, Mason, Owen and Robertson Counties:

Pipefitters and Plumbers 26.93 12.61

LABORERS:

Bath, Bourbon, Boyd, Boyle, Bracken, Carter, Clark, Elliott, Fayette, Fleming, Franklin, Gallatin, Grant, Greenup, Harrison, Jessamine, Lewis, Madison, Mason, Mercer, Montgomery, Nicholas, Owen, Robertson, Rowan, Scott, & Woodford Counties:

GROUP 1 - Aging and curing of concrete, Asbestos Abatement Worker, Asphalt Plant, Asphalt, Batch Truck Dump, Carpenter Tender, Cement Mason Tender, Cleaning of Machines, Concrete, Demolition, Dredging, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Level D, Flagperson, Grade Checker, Hand Digging and Hand Back Filling, Highway Marker Placer, Landscaping Mesh Handler and Placer, Puddler, Railroad, Rip-Rap and Grouter, Right-of-Way Sign, Guard rail and Fence Installer, Signal Person, Sound Barrier Installer, Storm and Sanitary Sewer, Swamper, Truck Spotter and Dumper, and Wrecking of Concrete Forms, General Cleanup.

BASE RATE 19.33

FRINGE BENEFITS 9.18

Group 2 - Batter Board Man (Sanitary And Storm Sewer), Brickmason Tender, Mortar Mixer Operator, Scaffold Builder, Burner and Welder, Bushhammer, Chain Saw Operator, Concrete Saw Operator, Deckhand Scow Man, Dry Cement Handler, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Level C, Forklift Operator for Masonary, Form Setter, Green Concrete Cutting, Hand Operated Grouter and Grinder Machine Operator, Jackhammer, Pavement Breaker, Paving Joint Machine, Pipelayer, Plastic Pipe Fusion, Power Driven Georgia Buggy and Wheel Barrow, Power Post Hole Digger, Precast Manhole Setter, Walk-Behind Tamper, Walk-Behind Trencher, Sand Blaster, Concrete Chipper, Surface Grinder, Vibrator Operator and Wagon Driller.

BASE RATE 19.58

FRINGE BENEFITS 9.18

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

LABORERS: (continued)

GROUP 3 - Asphalt Luteman and Raker, Gunnite Nozzleman, Gunnite Operator and Mixer, Grout Pump Operator, Side Rail Setter, Rail Paved Ditch, Screw Operator, Tunnel (Free Air) and Water Blaster.

BASE RATE19.63
FRINGE BENEFITS9.18

GROUP 4 - Caisson Worker (Free Air), Cement Finisher, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Levels A and B, Miner and Driller (Free Air), Tunnel Blaster and Tunnel Mucker (Free Air), Directional & Horizontal Boring, Air Track Drillers (all types), Powdermen & Blasters, Troxler & Concrete Tester if Laborer is Utilized.

BASE RATE20.23
FRINGE BENEFITS9.18

LABORERS:

Anderson, Bullitt, Carroll, Hardin, Henry, Jefferson, Larue, Marion, Meade, Nelson, Oldham, Shelby, Spencer, Trimble & Washington Counties:

GROUP 1 - Aging and curing of concrete, Asbestos Abatement Worker, Asphalt Plant, Asphalt, Batch Truck Dump, Carpenter Tender, Cement Mason Tender, Cleaning of Machines, Concrete, Demolition, Dredging, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Level D, Flagperson, Grade Checker, Hand Digging and Hand Back Filling, Highway Marker Placer, Landscaping Mesh Handler and Placer, Puddler, Railroad, Rip-Rap and Grouter, Right-of-Way Sign, Guard rail and Fence Installer, Signal Person, Sound Barrier Installer, Storm and Sanitary Sewer, Swamper, Truck Spotter and Dumper, and Wrecking of Concrete Forms, General Cleanup.

BASE RATE19.33
FRINGE BENEFITS9.18

Group 2 - Batter Board Man (Sanitary And Storm Sewer), Brickmason Tender, Mortar Mixer Operator, Scaffold Builder, Burner and Welder, Bushhammer, Chain Saw Operator, Concrete Saw Operator, Deckhand Scow Man, Dry Cement Handler, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Level C, Forklift Operator for Masonary, Form Setter, Green Concrete Cutting, Hand Operated Grouter and Grinder Machine Operator, Jackhammer, Pavement Breaker, Paving Joint Machine, Pipelayer, Plastic Pipe Fusion, Power Driven Georgia Buggy and Wheel Barrow, Power Post Hole Digger, Precast Manhole Setter, Walk-Behind Tamper, Walk-Behind Trencher, Sand Blaster, Concrete Chipper, Surface Grinder, Vibrator Operator and Wagon Driller.

BASE RATE19.58
FRINGE BENEFITS9.18

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

LABORERS: (continued)

GROUP 3 - Asphalt Luteman and Raker, Gunnite Nozzleman, Gunnite Operator and Mixer, Grout Pump Operator, Side Rail Setter, Rail Paved Ditch, Screw Operator, Tunnel (Free Air) and Water Blaster.

BASE RATE19.63
FRINGE BENEFITS9.18

GROUP 4 - Caisson Worker (Free Air), Cement Finisher, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Levels A and B, Miner and Driller (Free Air), Tunnel Blaster and Tunnel Mucker (Free Air), Directional & Horizontal Boring, Air Track Drillers (all types), Powdermen & Blasters, Troxler & Concrete Tester if Laborer is Utilized.

BASE RATE20.23
FRINGE BENEFITS9.18

LABORERS:

Breckinridge & Grayson Counties:

GROUP 1 - Aging and curing of concrete, Asbestos Abatement Worker, Asphalt Plant, Asphalt, Batch Truck Dump, Carpenter Tender, Cement Mason Tender, Cleaning of Machines, Concrete, Demolition, Dredging, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Level D, Flagperson, Grade Checker, Hand Digging and Hand Back Filling, Highway Marker Placer, Landscaping Mesh Handler and Placer, Puddler, Railroad, Rip-Rap and Grouter, Right-of-Way Sign, Guard rail and Fence Installer, Signal Person, Sound Barrier Installer, Storm and Sanitary Sewer, Swamper, Truck Spotter and Dumper, and Wrecking of Concrete Forms, General Cleanup.

BASE RATE19.88
FRINGE BENEFITS8.63

Group 2 - Batter Board Man (Sanitary And Storm Sewer), Brickmason Tender, Mortar Mixer Operator, Scaffold Builder, Burner and Welder, Bushhammer, Chain Saw Operator, Concrete Saw Operator, Deckhand Scow Man, Dry Cement Handler, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Level C, Forklift Operator for Masonary, Form Setter, Green Concrete Cutting, Hand Operated Grouter and Grinder Machine Operator, Jackhammer, Pavement Breaker, Paving Joint Machine, Pipelayer, Plastic Pipe Fusion, Power Driven Georgia Buggy and Wheel Barrow, Power Post Hole Digger, Precast Manhole Setter, Walk-Behind Tamper, Walk-Behind Trencher, Sand Blaster, Concrete Chipper, Surface Grinder, Vibrator Operator and Wagon Driller.

BASE RATE20.13
FRINGE BENEFITS8.63

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

LABORERS: (continued)

GROUP 3 - Asphalt Luteman and Raker, Gunnite Nozzleman, Gunnite Operator and Mixer, Grout Pump Operator, Side Rail Setter, Rail Paved Ditch, Screw Operator, Tunnel (Free Air) and Water Blaster.

BASE RATE20.18
FRINGE BENEFITS8.63

GROUP 4 - Caisson Worker (Free Air), Cement Finisher, Environmental - Nuclear, Radiation, Toxic and Hazardous Waste - Levels A and B, Miner and Driller (Free Air), Tunnel Blaster and Tunnel Mucker (Free Air), Directional & Horizontal Boring, Air Track Drillers (all types), Powdermen & Blasters, Troxler & Concrete Tester if Laborer is Utilized.

BASE RATE20.78
FRINGE BENEFITS8.63

TRUCK DRIVER CLASSIFICATIONS:

BASE RATE

GROUP 1 - Mobile Batch Truck Tender 16.57

GROUP 2 - Greaser, Tire Changer and Mechanic Tender 16.68

GROUP 3 - Single Axle Dump, Flatbed, Semi-trailer or Pole Trailer when used to pull building materials and equipment, Tandem Axle Dump, Distributor, Mixer and Truck Mechanic 16.86

GROUP 4 - Euclid & Other Heavy Earthmoving Equipment & Lowboy, Articulator Cat, 5-Axle Vehicle, Winch & A-Frame when used in transporting materials, Ross Carrier, Forklift when used to transport building materials and Pavement Breaker16.96

FRINGE BENEFITS.....7.34

OPERATING ENGINEERS:

A-Frame Winch Truck, Auto Patrol, Backfiller, Batcher Plant, Bituminous Paver, Bituminous Transfer Machine, Boom Cat, Bulldozer, Mechanic, Cableway, Carry-All Scoop, Carry Deck Crane, Central Compressor Plant, Clamshell, Concrete Mixer (21 Cu. Ft. or Over), Concrete Paver, Truck-Mounted Concrete Pump, Core Drill, Crane, Crusher Plant, Derrick, Derrick Boat, Ditching and Trenching Machine, Dragline, Dredge Operator, Dredge Engineer, Elevating Grader and Loaders, Grade-All, Gurries, Heavy Equipment Robotics Operator/Mechanic, High Lift, Hoe-Type Machine, Hoist (two or more drums), Hoisting Engine (two or more drums), Horizontal Directional Drill Operator, Hydrocrane, Hyster, Kecal Loader, Letourneau, Locomotive,

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

OPERATING ENGINEERS: (continued)

Mechanically Operated Laser Screed, Mechanic Welder, Mucking Machine, Motor Scraper, Orangepeel Bucket, Piledriver, Power Blade, Pumpcrete, Push Dozer, Rock Spreader Attached to Equipment, Rotary Drill, Roller (Bituminous), Scarifier, Scoopmobile, Shovel, Side Boom, Subgrader, Tailboom, Telescoping Type Forklift, Tow or Push Boat, Tower Crane (French, German and other types), Tractor Shovel and Truck Crane, Tunnel Mining Machines, Including Moles, Shields or similar types of Tunnel Mining Equipment.

BASE RATE22.95
FRINGE BENEFITS11.90

Air Compressor (over 900 cu. ft. per min.), Bituminous Mixer, Boom Type Tamping Machine, Bull Float, Concrete Mixer (under 21 cu. ft.), Dredge Engineer, Electric Vibrator Compactor/Self-Propelled Compactor, Elevator (one drum or Buck Hoist), Elevator (when used to hoist building material), Finish Machine, Fireman & Hoist (one drum), Flexplane, Forklift (regardless of lift height), Form Grader, Joint Sealing Machine, Outboard Motor Boat, Power Sweeper (riding type), Roller (rock), Ross Carrier, Skid Mounted Or Trailer Mounted Concrete Pump, Skid Steer Machine with all attachments, Switchman or Brakeman, Throttle Valve Person, Tractair and Road Widening Trencher, Tractor (50 H.P. or over), Truck Crane Oiler, Tugger, Welding Machine, Well Points and Whirley Oiler.

BASE RATE20.53
FRINGE BENEFITS11.90

All off road material handling equipment, including Articulating Dump Trucks, Greaser on Grease facilities servicing heavy equipment.

BASE RATE20.91
FRINGE BENEFITS11.90

Bituminous Distributor, Burlap and Curing Machine, 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), Steerman, Tamping Machine, Tractor (under 50 H.P.) and Vibrator.

BASE RATE20.27
FRINGE BENEFITS11.90

Cranes - with Booms 150 ft. and over (including jib), and where the length of the Boom in combination with the length of the piling leads equals or exceeds 150 ft. - \$1.00 over Group 1 rate.

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

Employees assigned to work below ground level are to be paid 10% above basic wage rate. This does not apply to open cut work.

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

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

These rates are listed pursuant to Kentucky Determination No. CR-05-III HWY dated May 16, 2006 and/or Federal Decision Number KY20070027 dated February 9, 2007 modification #1 dated May 4, 2007, modification #2 dated June 1, 2007 and modification #3 dated July 6, 2007.

No laborer, workman or mechanic shall be paid at a rate less than that of a Journeyman except those classified as bona fide apprentices.

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

Before using apprentices on the job the contractor shall present to the Contracting Officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U. S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U. S. Bureau of Apprenticeship and Training.

The contractor shall submit to the Contracting Officer, written evidence of the established apprenticeship-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

**TRANSPORTATION CABINET
DIVISION OF CONSTRUCTION PROCUREMENT
COMPLIANCE SECTION
PROJECT WAGE RATES**

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

The wages indicated on this wage schedule are the least permitted to be paid for the occupations indicated. When an employee works in more than one classification, the employer must record the number of hours worked in each classification at the prescribed hourly base rate.

OVERTIME:

Overtime is to be paid after an employee works eight (8) hours a day or forty (40) hours a week, whichever gives the employee the greater wages. At least time and one-half the base rate is required for all overtime. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. Wage violations or questions should be directed to the designated Engineer or the undersigned.

Steve Waddle, Director
Division of Construction Procurement
Frankfort, Kentucky 40622

PART IV
INSURANCE

INSURANCE

The Contractor shall carry the following insurance in addition to the insurance required by law:

1. Contractor's Public Liability Insurance not less than \$100,000.00 for damages arising out of bodily injuries to or death to one person. Not less than \$300,000.00 for damages arising out of bodily injuries to or death to two or more persons.
2. Contractor's Property Damages Liability Insurance. Not less than \$100,000.00 for all damages arising out of injury or destruction of property in any one accident. Not less than \$300,000.00 for all damages during the policy period.
3. Contractor's Protective Public Liability and Property Damage Insurance. The contractor shall furnish evidence with respect to operations performed for him by subcontractors that he carries in his own behalf for the above stipulated amounts.
4. The insurance required above must be evidenced by a Certificate of Insurance and this Certificate of Insurance must contain one of the following statements:
 - a. "policy contains no deductible clauses."
 - b. "policy contains _____ (amount) deductible property damage clause but company will pay claim and collect the deductible from the insured."
5. WORKMEN'S COMPENSATION INSURANCE. The contractor shall furnish evidence of coverage of all his employees or give evidence of self-insurance by submitting a copy of a certificate issued by the Workmen's Compensation Board.

PART V

STATEMENT OF INCOMPLETE WORK

PART VI

BID ITEMS

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 1

Contract ID: 07-1036

GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
SHOWING TOTAL AMOUNT BID USING FIGURES ONLY

Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
		ROADWAY			.	.
0010	00001	DGA BASE	9,122.00	TON	.	.
0020	00078	CRUSHED AGGREGATE SIZE NO 2	5,000.00	TON	.	.
0030	00190	LEVELING & WEDGING PG64-22	1,961.00	TON	.	.
0040	00221	CL2 ASPH BASE 0.75D PG64-22	14,619.00	TON	.	.
0050	00307	CL2 ASPH SURF 0.38B PG64-22	3,199.00	TON	.	.
0060	00440	ENTRANCE PIPE-15 INCH	43.10	LF	.	.
0070	00521	STORM SEWER PIPE-15 INCH	2,581.40	LF	.	.
0080	00522	STORM SEWER PIPE-18 INCH	2,997.60	LF	.	.
0090	00523	STORM SEWER PIPE-21 INCH	1,287.60	LF	.	.
0100	00524	STORM SEWER PIPE-24 INCH	2,387.90	LF	.	.
0110	00530	STORM SEWER PIPE-48 INCH	92.40	LF	.	.
0120	00560	STORM SEWER PIPE-48 INCH EQUIV	259.20	LF	.	.
0130	00981	SLOTTED DRAIN PIPE-15 INCH	323.40	LF	.	.
0140	01310	REMOVE PIPE	2,292.00	LF	.	.
0150	01314	PLUG PIPE	1.00	EACH	.	.
0160	01456	CURB BOX INLET TYPE A	1.00	EACH	.	.
0170	01480	CURB BOX INLET TYPE B	69.00	EACH	.	.
0180	01487	CURB BOX INLET TYPE F	2.00	EACH	.	.
0190	01490	DROP BOX INLET TYPE 1	1.00	EACH	.	.
0200	01496	DROP BOX INLET TYPE 3	9.00	EACH	.	.
0210	01538	DROP BOX INLET TYPE 7	1.00	EACH	.	.
0220	01541	DROP BOX INLET TYPE 10	1.00	EACH	.	.
0230	01544	DROP BOX INLET TYPE 11	7.00	EACH	.	.
0240	01559	DROP BOX INLET TYPE 13G	7.00	EACH	.	.
0250	01580	DROP BOX INLET TYPE 15	1.00	EACH	.	.
0260	01581	DROP BOX INLET TYPE 16G	2.00	EACH	.	.

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 2

Contract ID: 07-1036

GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
SHOWING TOTAL AMOUNT BID USING FIGURES ONLY

Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
0270	01585	REMOVE DROP BOX INLET	23.00	EACH	.	.
0280	01641	JUNCTION BOX-15 INCH	1.00	EACH	.	.
0290	01642	JUNCTION BOX-18 INCH	3.00	EACH	.	.
0300	01643	JUNCTION BOX-24 INCH	3.00	EACH	.	.
0310	01644	JUNCTION BOX-30 INCH	1.00	EACH	.	.
0320	01651	JUNCTION BOX-MODIFIED	1.00	EACH	.	.
0330	01710	FILL AND CAP CATCH BASIN	6.00	EACH	.	.
0340	01810	STANDARD CURB AND GUTTER	10,090.00	LF	.	.
0350	01875	STANDARD HEADER CURB	2,230.00	LF	.	.
0360	01880	BARRIER HEADER CURB	128.00	LF	.	.
0370	01895	VALLEY GUTTER	191.00	LF	.	.
0380	01946	MOUNTABLE MEDIAN TYPE 2A	26.40	SQYD	.	.
0390	02101	CEM CONC ENT PAVEMENT-8 INCH	4,355.00	SQYD	.	.
0400	02159	TEMPORARY DITCH	7,229.00	LF	.	.
0410	02200	ROADWAY EXCAVATION	14,621.00	CUYD	.	.
0420	02242	WATER	200.00	MGAL	.	.
0430	02437	R/W MARKER MUNICIPAL TYPE 1	80.00	EACH	.	.
0440	02483	CHANNEL LINING CLASS II	183.00	TON	.	.
0450	02545	CLEARING AND GRUBBING 5 ACRES	1.00	LS	.	.
0460	02551	CONCRETE-CLASS A FOR STEPS	31.00	CUYD	.	.
0470	02555	CONCRETE-CLASS B	386.00	CUYD	.	.
0480	02562	SIGNS	100.00	SQFT	.	.
0490	02585	EDGE KEY	125.00	LF	.	.
0500	02596	FABRIC-GEOTEXTILE TYPE I	413.00	SQYD	.	.
0510	02598	FABRIC-GEOTEXTILE TYPE III	5,500.00	SQYD	.	.
0520	02611	HANDRAIL-TYPE A-1	359.00	LF	.	.

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 3

Contract ID: 07-1036

GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
SHOWING TOTAL AMOUNT BID USING FIGURES ONLY

Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
0530	02650	MAINTAIN & CONTROL TRAFFIC	1.00	LS	.	.
0540	02651	DIVERSIONS (BY-PASS DETOURS)	1.00	LS	.	.
0550	02677	ASPH PAVE MILLING & TEXTURING	77.00	TON	.	.
0560	02690	SAFELOADING	17.00	CUYD	.	.
0570	02701	TEMPORARY SILT FENCE	2,564.00	LF	.	.
0580	02703	SILT TRAP TYPE A	10.00	EACH	.	.
0590	02704	SILT TRAP TYPE B	43.00	EACH	.	.
0600	02706	CLEAN SILT TRAP TYPE A	20.00	EACH	.	.
0610	02707	CLEAN SILT TRAP TYPE B	43.00	EACH	.	.
0620	02709	CLEAN TEMPORARY SILT FENCE	2,564.00	LF	.	.
0630	02720	SIDEWALK-4 INCH CONCRETE	6,321.00	SQYD	.	.
0640	02726	STAKING	1.00	LS	.	.
0650	03383	PVC PIPE-4 INCH	24.00	LF	.	.
0660	03387	PVC PIPE-8 INCH	15.20	LF	.	.
0670	03391	PVC PIPE-12 INCH	26.00	LF	.	.
0680	05950	EROSION CONTROL BLANKET	15,530.00	SQYD	.	.
0690	05952	TEMPORARY MULCH	17,066.00	SQYD	.	.
0700	05953	TEMP SEEDING AND PROTECTION	7,766.00	SQYD	.	.
0710	05985	SEEDING AND PROTECTION	15,530.00	SQYD	.	.
0720	05990	SODDING	4,433.00	SQYD	.	.
0730	06510	PAVE STRIPING-TEMP PAINT-4 IN	26,775.00	LF	.	.
0740	06514	PAVE STRIPING-PERM PAINT-4 IN	29,683.00	LF	.	.
0750	06530	PAVE STRIPING REMOVAL-4 INCH	14,280.00	LF	.	.
0760	06566	PAVE MARKING-THERMO X-WALK-12 IN	1,760.00	LF	.	.
0770	06568	PAVE MARKING-THERMO STOP BAR-24IN	450.00	LF	.	.
0780	06573	PAVE MARKING-PRE THERM STR ARROW	2.00	EACH	.	.
0790	06574	PAVE MARKING-PRE THERM CURV ARROW	27.00	EACH	.	.

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 4

Contract ID: 07-1036

GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
SHOWING TOTAL AMOUNT BID USING FIGURES ONLY

Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
0800	06575	PAVE MARKING-PRE THERM COMB ARROW	2.00	EACH	.	.
0810	06576	PAVE MARKING-PREF THERMO ONLY	10.00	EACH	.	.
0820	06589	PAVEMENT MARKER TYPE V-MW	28.00	EACH	.	.
0830	06591	PAVEMENT MARKER TYPE V-BY	312.00	EACH	.	.
0840	08100	CONCRETE-CLASS A	10.00	CUYD	.	.
0850	08150	STEEL REINFORCEMENT	660.00	LB	.	.
0860	10000NS	LOT PAY ADJUSTMENT	38,718.00	DOLL	1.0000	38,718.00
0870	10020NS	FUEL ADJUSTMENT	19,604.00	DOLL	1.0000	19,604.00
0880	10030NS	ASPHALT ADJUSTMENT	34,846.00	DOLL	1.0000	34,846.00
0890	20496NS843	SILT TRAP TYPE C	109.00	EACH	.	.
0900	20497NS843	CLEAN SILT TRAP TYPE C	109.00	EACH	.	.
0910	20588NC	INSTALL PROJECT IDENTIFICATION SIGNS	2.00	EACH	.	.
0920	21433ES214	FABRIC GEOTEXTILE TY IV FOR PIPE	13,686.00	SQYD	2.0000	27,372.00
		BRIDGE			.	.
0930	02403	REMOVE CONCRETE MASONRY	84.50	CUYD	.	.
0940	08001	STRUCTURE EXCAVATION-COMMON	100.00	CUYD	.	.
0950	08002	STRUCTURE EXCAV-SOLID ROCK	32.00	CUYD	.	.
0960	08100	CONCRETE-CLASS A	110.60	CUYD	.	.
0970	08150	STEEL REINFORCEMENT	15,044.00	LB	.	.
		GAS			.	.
0980	02235	BACKFILLING UNDERCUT	100.00	CUYD	.	.
0990	03400	GAS LINE-2 INCH	763.00	LF	.	.
1000	03404	GAS LINE-4 INCH	10,126.00	LF	.	.
1010	21207ND	POLYVALVE AND BOX-4 IN	25.00	EACH	.	.
1020	21208ND	POLYVALVE AND BOX-2 IN	7.00	EACH	.	.
1030	21213ED	CONCRETE PAVING REPLACEMENT	1,099.00	LF	.	.

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 5

Contract ID: 07-1036

GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
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Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
1040	21233ED	ASPHALT PAVING REPLACEMENT	1,835.00	LF	.	.
1050	21475ED	SERVICE TUBING-3/4 IN	720.00	LF	.	.
1060	21933EN	AGGREGATE SURFACE REPLACEMENT	583.00	LF	.	.
1070	21952EN	CONCRETE FOR THRUST BLOCKS-ETC	13.00	CUYD	.	.
1080	21953EN	UNCLASSIFIED EXCAVATION FOR UNDERCUTS	100.00	CUYD	.	.
1090	21954EN	GAS MAIN 4 IN-WITH STEEL PIPE 8 IN	224.00	LF	.	.
1100	21955EN	BORE AND JACK PIPE-4 IN	492.00	LF	.	.
1110	21956EN	GAS MAIN 2 IN-WITH STEEL PIPE 8 IN	18.00	LF	.	.
1120	21957EN	BORE AND JACK PIPE-2 IN	58.00	LF	.	.
1130	21958NN	REMOVE AND RESET GAS METER	4.00	EACH	.	.
1140	21959NN	GAS SERVICE CONNECTION	58.00	EACH	.	.
1150	21960NN	CONNECT TO GAS MAIN	13.00	EACH	.	.
1160	21961NN	CUT AND CAP GAS MAIN	13.00	EACH	.	.
		SEWER			.	.
1170	01050	SEWER PIPE-4 INCH	304.00	LF	.	.
1180	01095	DUCTILE IRON PIPE-8 INCH	509.00	LF	.	.
1190	01105	DUCTILE IRON PIPE-18 INCH	82.00	LF	.	.
1200	01786	FILL AND CAP MANHOLE	11.00	EACH	.	.
1210	01787	REMOVE MANHOLE	1.00	EACH	.	.
1220	02235	BACKFILLING UNDERCUT	100.00	CUYD	.	.
1230	03385	PVC PIPE-6 INCH	765.00	LF	.	.
1240	03387	PVC PIPE-8 INCH	3,341.00	LF	.	.
1250	03389	PVC PIPE-10 INCH	249.00	LF	.	.
1260	03442	DUCTILE IRON FITTINGS	95.00	LB	.	.
1270	03443	CUT CAP & BLOCK	37.00	EACH	.	.
1280	03444	RECONNECT SEWER SERVICE	40.00	EACH	.	.
1290	03495	AIR RELEASE VALVE	1.00	EACH	.	.

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 6

Contract ID: 07-1036

GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
SHOWING TOTAL AMOUNT BID USING FIGURES ONLY

Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
1300	20423EC	WATERTIGHT FRAME AND LID	3.00	EACH	.	.
1310	20796ED	PVC PIPE-15 IN	249.00	LF	.	.
1320	20901ED	CONC FLOWABLE FILL FOR PIPELINE TRENCH	139.00	LF	.	.
1330	21213ED	CONCRETE PAVING REPLACEMENT	475.00	LF	.	.
1340	21233ED	ASPHALT PAVING REPLACEMENT	675.00	LF	.	.
1350	21290ND	BORE AND JACK 18 IN PIPE	56.00	LF	.	.
1360	21350ND	CAST IRON MANHOLE FRAME AND COVER	30.00	EACH	.	.
1370	21384ED	BORE AND JACK PIPE-6 IN	100.00	LF	.	.
1380	21401ED	BORE AND JACK PIPE-8 IN	142.00	LF	.	.
1390	21825EN	PVC PIPE-18 IN	10.00	LF	.	.
1400	21916EN	PVC PIPE 6 IN-WITH STEEL PIPE 12 IN	57.00	LF	.	.
1410	21918NN	MANHOLE-4 FT	30.00	EACH	.	.
1420	21919NN	MANHOLE-5 FT	3.00	EACH	.	.
1430	21921EN	MANHOLE-4 FT BARREL EXTENSION	95.00	VTFT	.	.
1440	21922EN	MANHOLE-5 FT BARREL EXTENSION	17.00	VTFT	.	.
1450	21933EN	AGGREGATE SURFACE REPLACEMENT	20.00	LF	.	.
1460	21949EN	PVC PIPE 8 IN-WITH STEEL PIPE 12 IN	232.00	LF	.	.
1470	21952EN	CONCRETE FOR THRUST BLOCKS-ETC	8.00	CUYD	.	.
1480	21953EN	UNCLASSIFIED EXCAVATION FOR UNDERCUTS	100.00	CUYD	.	.
1490	21955EN	BORE AND JACK PIPE-4 IN	56.00	LF	.	.
1500	21962EN	PVC PIPE 18 IN-WITH STEEL PIPE 24 IN	27.00	LF	.	.
1510	21963NN	DROP PIPE ASSEMBLY FOR MANHOLE	3.00	EACH	.	.
1520	21964NN	KOR-N-SEAL CONNECT TO MANHOLE	3.00	EACH	.	.
1530	21965EN	PVC PIPE 4 IN-WITH STEEL PIPE 6 IN	46.00	LF	.	.
		SIGNALS			.	.
1540	04700	POLE 30 FT MTG HT	2.00	EACH	.	.
1550	04750	TRANSFORMER BASE	2.00	EACH	.	.

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 7

Contract ID: 07-1036

GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
SHOWING TOTAL AMOUNT BID USING FIGURES ONLY

Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
1560	04793	CONDUIT-1 1/4 INCH	220.00	LF	.	.
1570	04795	CONDUIT-2 INCH	377.00	LF	.	.
1580	04811	JUNCTION BOX TYPE B	6.00	EACH	.	.
1590	04820	TRENCHING AND BACKFILLING	295.00	LF	.	.
1600	04821	OPEN CUT ROADWAY	105.00	LF	.	.
1610	04830	LOOP WIRE	6,021.00	LF	.	.
1620	04844	CABLE-NO. 14/5C	4,291.00	LF	.	.
1630	04845	CABLE-NO. 14/7C	649.00	LF	.	.
1640	04850	CABLE-NO. 14/1 PAIR	3,054.00	LF	.	.
1650	04882	SIGNAL PEDESTAL	3.00	EACH	.	.
1660	04885	MESSENGER-10800 LB	960.00	LF	.	.
1670	04887	INSTALL LED SIGNAL	4.00	EACH	.	.
1680	04895	LOOP SAW SLOT AND FILL	2,472.00	LF	.	.
1690	04900	PEDESTRIAN DETECTOR	20.00	EACH	.	.
1700	04930	BEACON CONTROLLER-2 CIRCUIT	2.00	EACH	.	.
1710	04931	INSTALL CONTROLLER TYPE 170	3.00	EACH	.	.
1720	04932	INSTALL STEEL STRAIN POLE	12.00	EACH	.	.
1730	04950	REMOVE SIGNAL EQUIPMENT	5.00	EACH	.	.
1740	06472	INSTALL SPAN MOUNTED SIGN	2.00	EACH	.	.
1750	20093ES835	INSTALL PEDESTRIAN HEAD-LED	20.00	EACH	.	.
1760	20094ES835	TEMP RELOCATION OF SIGNAL HEAD	30.00	EACH	.	.
1770	20188ES835	INSTALL LED SIGNAL-3 SECTION	18.00	EACH	.	.
1780	20189ES835	INSTALL LED SIGNAL-5 SECTION	2.00	EACH	.	.
1790	20266ES835	INSTALL LED SIGNAL- 4 SECTION	2.00	EACH	.	.
		WATERLINE			.	.
1800	01093	DUCTILE IRON PIPE-6 INCH	459.00	LF	.	.
1810	01099	DUCTILE IRON PIPE-12 INCH	164.00	LF	.	.

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 8

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GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
SHOWING TOTAL AMOUNT BID USING FIGURES ONLY

Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
1820	01315	BLOW-OFF ASSEMBLY	1.00	EACH	.	.
1830	02235	BACKFILLING UNDERCUT	100.00	CUYD	.	.
1840	02605	REMOVE & RESET FIRE HYDRANT	11.00	EACH	.	.
1850	03360	COPPER PIPE-3/4 INCH	1,000.00	LF	.	.
1860	03381	PVC PIPE-2 INCH	584.00	LF	.	.
1870	03383	PVC PIPE-4 INCH	60.00	LF	.	.
1880	03385	PVC PIPE-6 INCH	10,424.00	LF	.	.
1890	03387	PVC PIPE-8 INCH	27.00	LF	.	.
1900	03437	RECONNECT SERVICE	84.00	EACH	.	.
1910	03442	DUCTILE IRON FITTINGS	7,128.00	LB	.	.
1920	03460	TIE-IN TO WATER LINE	20.00	EACH	.	.
1930	03522	GATE VALVE-2 INCH	3.00	EACH	.	.
1940	03524	GATE VALVE-4 INCH	2.00	EACH	.	.
1950	03526	GATE VALVE-6 INCH	54.00	EACH	.	.
1960	03528	GATE VALVE-8 INCH	1.00	EACH	.	.
1970	03550	CUT & CAP EXIST WATER MAIN	20.00	EACH	.	.
1980	20156EC	FIRE HYDRANT ASSEMBLY	20.00	EACH	.	.
1990	20887ND	WATER SERVICE CONNECTION TO WATER MAIN	86.00	EACH	.	.
2000	20901ED	CONC FLOWABLE FILL FOR PIPELINE TRENCH	190.00	LF	.	.
2010	21213ED	CONCRETE PAVING REPLACEMENT	1,222.00	LF	.	.
2020	21233ED	ASPHALT PAVING REPLACEMENT	1,890.00	LF	.	.
2030	21344ND	REM AND RESET WATER METER AND BOX	74.00	EACH	.	.
2040	21384ED	BORE AND JACK PIPE-6 IN	496.00	LF	.	.
2050	21400ED	BORE AND JACK PIPE-12 IN	92.00	LF	.	.
2060	21401ED	BORE AND JACK PIPE-8 IN	72.00	LF	.	.
2070	21908NN	BUTTERFLY VALVE AND BOX-12 IN	2.00	EACH	.	.
2080	21916EN	PVC PIPE 6 IN-WITH STEEL PIPE 12 IN	193.00	LF	.	.

TRANSPORTATION CABINET

Department of Highways

FRANKFORT, KY 40622

Sheet No: 9

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GRAYSON COUNTY

FD04 043 0062 021-023

Letting: 7/27/07

THE BIDDER MUST MAKE THE EXTENSIONS AND ADDITIONS
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Item No.	Code No.	Item	Approximate Quantity	Unit	Unit Price Dollars	Amount Dollars
2090	21933EN	AGGREGATE SURFACE REPLACEMENT	730.00	LF	.	.
2100	21949EN	PVC PIPE 8 IN-WITH STEEL PIPE 12 IN	4.00	LF	.	.
2110	21950EN	DIP 6 IN-WITH STEEL PIPE 12 IN	29.00	LF	.	.
2120	21951EN	PVC PIPE 4 IN-WITH STEEL PIPE 8 IN	17.00	LF	.	.
2130	21952EN	CONCRETE FOR THRUST BLOCKS-ETC	55.00	CUYD	.	.
2140	21953EN	UNCLASSIFIED EXCAVATION FOR UNDERCUTS	100.00	CUYD	.	.
		MOBILIZATION AND DEMOBILIZATION			.	.
2150	02568	MOBILIZATION	1.00	LS	.	.
2160	02569	DEMOBILIZATION	1.00	LS	.	.
TOTAL BID					\$.

PART VII
CERTIFICATIONS

PROVISIONS RELATIVE TO SENATE BILL 258 (1994)

During the performance of the contract, the contractor agrees to comply with applicable provisions of:

1. KRS 136 Corporation and Utility Taxes
2. KRS 139 Sale and Use Taxes
3. KRS 141 Income Taxes
4. KRS 337 Wages and Hours
5. KRS 338 Occupational Safety and Health of Employees
6. KRS 341 Unemployment Compensation
7. KRS 342 Workers Compensation

Any final determinations of a violation by the contractor within the previous five (5) years pursuant to the applicable statutes above are revealed as follows:

NON-COLLUSION CERTIFICATION

COMMONWEALTH OF KENTUCKY

COUNTY _____

PROJECT NO. _____

I, _____, _____, under
(Name of officer signing certification) (Title)

penalty of perjury under the laws of the United States, do hereby certify that

(Insert name of Individual, Joint Venture, Co-partnership, or Corporation submitting bid)

its agent, officers or employees have not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding in connection with this proposal.

(Signature)

(Title)

REVISED: 8-23-89

NON-COLLUSION CERTIFICATION

COMMONWEALTH OF KENTUCKY

COUNTY _____

PROJECT NO. _____

I, _____, _____, under
(Name of officer signing certification) (Title)

penalty of perjury under the laws of the United States, do hereby certify that

(Insert name of Individual, Joint Venture, Co-partnership, or Corporation submitting bid)

its agent, officers or employees have not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding in connection with this proposal.

(Signature)

(Title)

REVISED: 8-23-89

CERTIFICATION OF BID PROPOSAL

We (I) propose to furnish all labor, equipment and materials necessary to construct and/or improve the subject project in accordance with the plans, the Transportation Cabinet's Standard Specifications for Road and Bridge Construction, current edition, special provisions, notes applicable to the project as indicated herein and all addenda issued on this project subsequent to purchase of proposal.

We (I) attach a bid proposal guaranty as provided in the special provisions in an amount not less than 5% of the total bid. We agree to execute a contract in accordance with this bid proposal within 15 calendar days after the receipt of the notice of award for the project.

We (I) have examined the site of proposed work, project plans, specifications, special provisions, and notes applicable to the project referred to herein. We understand that the quantities shown herein are estimated quantities subject to increase or decrease as provided in the specifications.

We (I) acknowledge receipt of all addendum(s) (if applicable) and have made the necessary revisions to the bid proposal. We have considered all addendum(s) in the calculation of the submitted bid and applied the updated bid items, which are included.

- No Addendum(s) have been posted

Name of Contracting Firm

BY: _____
Authorized Agent (Signature) Title

Address City State Zip Code

Telephone Number

When two or more organizations bid as a joint venture, enter names of each organization and an authorized agent for each organization must sign above.