**CALL NO. 315**

**CONTRACT ID. 221328**

**PIKE COUNTY**

**FED/STATE PROJECT NUMBER FD04 098 0199 009-011**

**DESCRIPTION HUDDY-McVEIGH ROAD (KY 199)**

**WORK TYPE GRADE & DRAIN WITH ASPHALT SURFACE**

**PRIMARY COMPLETION DATE 320 WORKING DAYS**

**LETTING DATE: July 21,2022**

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN DAYLIGHT TIME July 21,2022. Bids will be publicly announced at 10:00 AM EASTERN DAYLIGHT TIME.

**PLANS AVAILABLE FOR THIS PROJECT.**

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

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# PART I

# SCOPE OF WORK

# ADMINISTRATIVE DISTRICT - 12

**CONTRACT ID - 221328**

**FD04 098 0199 009-011**

**COUNTY - PIKE**

**PCN - DE09801992228**
**FD04 098 0199 009-011**

HUDDY-McVEIGH ROAD (KY 199) SPOT IMPROVEMENTS AND RELOCATE PORTIONS OF KY 199 ALONG NORFOLK SOUTHERN RAILROAD BED AT STONE, A DISTANCE OF 01.21 MILES.GRADE & DRAIN WITH ASPHALT SURFACE SYP NO. 12-00298.40.

GEOGRAPHIC COORDINATES LATITUDE 37:35:00.00 LONGITUDE 82:16:00.00

ADT 2,400

**COMPLETION DATE(S):**

| | |
|---|---|
| 320 WORKING | APPLIES TO CONTRACT |

# CONTRACT NOTES

## PROPOSAL ADDENDA

All addenda to this proposal must be applied when calculating bid and certified in the bid packet submitted to the Kentucky Department of Highways. Failure to use the correct and most recent addenda may result in the bid being rejected.

## BID SUBMITTAL

Bidder must use the Department's electronic bidding software. The Bidder must download the bid file located on the Bid Express website (www.bidx.com) to prepare a bid packet for submission to the Department. The bidder must submit electronically using Bid Express.

## JOINT VENTURE BIDDING

Joint venture bidding is permissible. All companies in the joint venture must be prequalified in one of the work types in the Qualifications for Bidders for the project. The bidders must get a vendor ID for the joint venture from the Division of Construction Procurement and register the joint venture as a bidder on the project. Also, the joint venture must obtain a digital ID from Bid Express to submit a bid. 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 shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. When prescribed in said directives, the contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom shall be contacted through their individual Protection Notification Center. Non-compliance with these directives can result in the enforcement of penalties.

## REGISTRATION WITH THE SECRETARY OF STATE BY A FOREIGN ENTITY

Pursuant to KRS 176.085(1)(b), an agency, department, office, or political subdivision of the Commonwealth of Kentucky shall not award a state contract to a person that is a foreign entity required by KRS 14A.9-010 to obtain a certificate of authority to transact business in the Commonwealth ("certificate") from the Secretary of State under KRS 14A.9-030 unless the person produces the certificate within fourteen (14) days of the bid or proposal opening. If the foreign entity is not required to obtain a certificate as provided in KRS 14A.9-010, the foreign entity should identify the applicable exception. Foreign entity is defined within KRS 14A.1-070.

**For all foreign entities required to obtain a certificate of authority to transact business in the Commonwealth, if a copy of the certificate is not received by the contracting agency within the time frame identified above, the foreign entity's solicitation response shall be deemed non-responsive or the awarded contract shall be cancelled.**

Businesses can register with the Secretary of State at https://secure.kentucky.gov/sos/ftbr/welcome.aspx .

## SPECIAL NOTE FOR PROJECT QUESTIONS DURING ADVERTISEMENT

Questions about projects during the advertisement should be submitted in writing to the Division of Construction Procurement. This may be done by fax (502) 564-7299 or email to kytc.projectquestions@ky.gov. The Department will attempt to answer all submitted questions. The Department reserves the right not to answer if the question is not pertinent or does not aid in clarifying the project intent.

The deadline for posting answers will be 3:00 pm Eastern Daylight Time, the day preceding the Letting. Questions may be submitted until this deadline with the understanding that the later a question is submitted, the less likely an answer will be able to be provided.

The questions and answers will be posted for each Letting under the heading "Questions & Answers" on the Construction Procurement website (www.transportation.ky.gov/contract). The answers provided shall be considered part of this Special Note and, in case of a discrepancy, will govern over all other bidding documents.

## HARDWOOD REMOVAL RESTRICTIONS

The US Department of Agriculture has imposed a quarantine in Kentucky and several surrounding states, to prevent the spread of an invasive insect, the emerald ash borer. Hardwood cut in conjunction with the project may not be removed from the state. Chipping or burning on site is the preferred method of disposal.

## INSTRUCTIONS FOR EXCESS MATERIAL SITES AND BORROW SITES

Identification of excess material sites and borrow sites shall be the responsibility of the Contractor. The Contractor shall be responsible for compliance with all applicable state and federal laws and may wish to consult with the US Fish and Wildlife Service to seek protection under Section 10 of the Endangered Species Act for these activities.

## ACCESS TO RECORDS

The contractor, as defined in KRS 45A.030 (9) agrees that the contracting agency, the Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this contract for the purpose of financial audit or program review. Records and other prequalification information confidentially

disclosed as part of the bid process shall not be deemed as directly pertinent to the contract and shall be exempt from disclosure as provided in KRS 61.878(1)(c). The contractor also recognizes that any books, documents, papers, records, or other evidence, received during a financial audit or program review shall be subject to the Kentucky Open Records Act, KRS 61.870 to 61.884.

In the event of a dispute between the contractor and the contracting agency, Attorney General, or the Auditor of Public Accounts over documents that are eligible for production and review, the Finance and Administration Cabinet shall review the dispute and issue a determination, in accordance with Secretary's Order 11-004.

April 30, 2018

# SPECIAL NOTE FOR RECIPROCAL PREFERENCE

## RECIPROCAL PREFERENCE TO BE GIVEN BY PUBLIC AGENCIES TO RESIDENT BIDDERS

By reference, KRS 45A.490 to 45A.494 are incorporated herein and in compliance regarding the bidders residency. Bidders who want to claim resident bidder status should complete the Affidavit for Claiming Resident Bidder Status along with their bid in the electronic bidding software. Submittal of the Affidavit should be done along the bid in Bid Express.

April 30, 2018

**ASPHALT MIXTURE**

Unless otherwise noted, the Department estimates the rate of application for all asphalt mixtures to be 110 lbs/sy per inch of depth.

**INCIDENTAL SURFACING**

The Department has included in the quantities of asphalt mixtures established in the proposal estimated quantities required for resurfacing or surfacing mailbox turnouts, farm field entrances, residential and commercial entrances, curve widening, ramp gores and tapers, and road and street approaches, as applicable. Pave these areas to the limits as shown on Standard Drawing RPM-110-06 or as directed by the Engineer. In the event signal detectors are present in the intersecting streets or roads, pave the crossroads to the right of way limit or back of the signal detector, whichever is the farthest back of the mainline. Surface or resurface these areas as directed by the Engineer. The Department will not measure placing and compacting for separate payment but shall be incidental to the Contract unit price for the asphalt mixtures.

**ASPHALT PAVEMENT RIDE QUALITY CATEGORY B**

The Department will apply Pavement Rideability Requirements on this project in accordance with Section 410, Category B.

**FUEL AND ASPHALT PAY ADJUSTMENT**

The Department has included the Contract items Asphalt Adjustment and Fuel Adjustment for possible future payments at an established Contract unit price of $1.00. The Department will calculate actual adjustment quantities after work is completed. If existing Contract amount is insufficient to pay all items on the contract with the adjustments, the Department will establish additional monies with a change order.

**OPTION A**

Be advised that the Department will accept compaction of asphalt mixtures furnished for driving lanes and ramps, at 1 inch (25mm) or greater, on this project according to OPTION A in accordance with Section 402 and Section 403 of the current Standard Specifications. The Department will require joint cores as described in Section 402.03.02 for surface mixtures only. The Department will accept compaction of all other asphalt mixtures according to OPTION B.

# Special Note #1
# Pike Co., Item # 12-298.40
# Utilities

There are several utilities that have yet to be relocated on this project. Two of the waterline impacts are in the construction contract. AEP, AT&T and Suddenlink have committed to have their utilities moved within 6 months of the letting date. To accommodate these relocations, 160 additional days have been added to the construction contract. The set of attached maps shows the locations of the impacted utilities and the attached spreadsheet gives the sheet number and approximate Station #. Contractor needs to coordinate with the utility companies prior to any work that would impact said utility. Impacts are listed on the attached spreadsheet and can be seen on the attached utility plan sheets. The above ground utilities are colored red and the below ground utilities are colored blue.

Some of the utilities may have been relocated on the ROW but are well outside of the disturbed limits and should not interfere with construction activities.

Contact information for the Utility Companies is:

## AEP
Bill Johnson
606-437-3823 (office)
606-794-7381 (cell)
wmjohnson@aep.com

## AT&T
Jack Salyer
606-874-2715 (office)
606-424-9328
Js2299@att.com

## Suddenlink
John Fletcher
615-638-5451
John.fletcher@alticetechserviceusa.com

# Special Note #2
# Box Culvert and Channel
# Station 165+07

There is a stone masonry channel that leads to the inlet of the proposed box culvert. There was a negative impact to the channel at approx.
Culvert Sta. 9+50 (see Plan Sheet R21 and Pipe Sheet R57).

Since this channel has been deemed “a contributing element to the Stone Historic District, especially given its relationship to the adjacent house”.

KYTC has committed to reconstruct a portion of this channel from approximate Culvert Station 9+43. The contractor will use stone from the channel and transition from the walls of the channel to the 2:1 sideslopes of the channel at approximate Culvert Station 9+50.

Details for the construction methods are listed below:

**Specifications for Reconstruction and Repair of Stone Channel**

The collapsed and damaged portion of the channel between the proposed new highway culvert and the proposed disturb limits will be rebuilt in accordance with the Secretary of Interior’s Standards by utilizing a qualified master craftsman stone mason. In the simplest terms in-kind materials and techniques will be used for the repair, notably rough cut sandstone with a soft, compatible mortar. Mortar joints shall match intact original portions of the channel. The contractor shall salvage and store sandstone from other structures being dismantled for the project, including the adjacent culverts. If additional stone is needed the contractor and mason shall source sandstone of a similar color and composition to that used historically in the channel. The reconstructed and repaired portions of the channel will tie in the existing intact portion outside of the project’s disturb limits.

These are the applicable Standards in full:
Standards for Rehabilitation (https://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf ; p76)

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired

Standards for Reconstruction (https://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf ; p.226)

1. Reconstruction will be used to depict vanished or non-surviving portions of a property when documentary and physical evidence is available to permit accurate reconstruction with minimal conjecture and such reconstruction is essential to the public understanding of the property.

2. Reconstruction of a landscape, building, structure or object in its historic location will be preceded by a thorough archeological investigation (KY 199 project has been cleared archaeologically, no additional work needed) to identify and evaluate those features and artifacts which are essential to an accurate reconstruction. If such resources must be disturbed, mitigation measures will be undertaken.

3. Reconstruction will include measures to preserve any remaining historic materials, features, and spatial relationships.

4. Reconstruction will be based on the accurate duplication of historic features and elements substantiated by documentary or physical evidence rather than on conjectural designs or the availability of different features from other historic properties. A reconstructed property will re-create the appearance of the non-surviving historic property in materials, design, color and texture.

5. A reconstruction will be clearly identified as a contemporary re-creation.

6. Designs that were never executed historically will not be constructed.

The SHPO will be consulted regarding plans for repair and reconstruction. The contractor shall notify the District 12 environmental coordinator, Paul Montgomery, prior to the stone mason commencing work. He will notify the Division of Environmental Analysis (DEA), who will then notify the State Historic Preservation Office (SHPO). This notification, which can take place via email, will include the name of the mason or company and their approach to the stone channel project. Any questions or concerns will be returned to the contractor within 5 business days. KYTC, working with DEA, has the option to consult with the Dry Stone Conservancy for the construction inspection of the wall. The SHPO shall be notified quarterly via email regarding the progress of the project and channel.

Site 4-
This is a stone-lined ditch that channelizes Mill Branch, a tributary draining to Pond Creek. It may have been built to control the flow of the stream around the manager's house. Overall it is intact, however there is a section that has washed out and collapsed. The walls near the railroad culvert, Site 5, appear to have been damaged and repaired several times, probably due to a combination of vibration and flooding. The channelized Mill Creek does not appear individually eligible for the National Register, but may be a contributing element to the Stone Historic District especially given its relationship to the adjacent house. The proposed project will remove about 20 feet of the channel, mostly in the section that has repeated damage. The project team has committed to rebuild the collapsed portion in accordance with the Secretary of Interior's Standards by utilizing a qualified stone mason and consulting with SHPO regarding plans for reconstruction. The wall will also be finished to the new culvert inlet. Because these plans will be incorporated into the construction document the proposed project will have No Adverse Effect on this site or the Stone Historic District.

Mill Branch channel looking east

# *SPECIAL NOTE*

## For Tree Removal

## PIKE COUNTY
## KY 199 Road Improvements
## Item No. 12-298.40

# NO CLEARING OF TREES 5 INCHES OR GREATER (DIAMETER BREAST HEIGHT) FROM JUNE 1 – JULY 31

**If there are any questions regarding this note, please contact the Division of Environmental Analysis, 200 Mero Street, Frankfort, KY 40601, Phone: (502) 564-7250.**

# SPECIAL NOTE FOR PIPELINE INSPECTION

**1.0 DESCRIPTION.** The Department will perform visual inspections on all pipe on the project. A video inspection will be required on projects having more than 250 linear feet of storm sewer and/or culvert pipe and on routes with an ADT of greater than 1,000 vehicles. Conduct video inspections on all pipe located under the roadway and 50 percent of the remaining pipe not under the roadway. Storm sewer runs and outfall pipes not under the roadway take precedence over rural entrance pipes. Contractors performing this item of work must be prequalified with the Department in the work type J51 (Video Pipe Inspection and Cleaning). Deflection testing shall be completed using a mandrel in accordance with the procedure outlined below or by physical measurement for pipes greater than 36inches in diameter. Mandrel testing for deflection must be completed prior to the video inspection testing. Unless otherwise noted, Section references herein are to the Department's Standard Specifications for Road and Bridge Construction, current edition.

**2.0 VIDEO INSPECTION.** Ensure pipe is clear of water, debris or obstructions. Complete the video inspection and any necessary measurement prior to placing the final surface over any pipe. When paving will not be delayed, take measurements 30 days or more after the completion of earthwork to within 1 foot of the finished subgrade. Notify the Engineer a minimum of 24 hours in advance of inspection and notify the Engineer immediately if distresses or locations of improper installation are logged.

## 2.1 INSPECTION FOR DEFECTS AND DISTRESSES

**A)** Begin at the outlet end and proceed through to the inlet at a speed less than or equal to 30 ft/minute. Remove blockages that will prohibit a continuous operation.

**B)** Document locations of all observed defects and distresses including but not limited to: cracking, spalling, slabbing, exposed reinforcing steel, sags, joint offsets, joint separations, deflections, improper joints/connections, blockages, leaks, rips, tears, buckling, deviation from line and grade, damaged coatings/paved inverts, and other anomalies not consistent with a properly installed pipe.

**C)** During the video inspection provide a continuous 360 degree pan of every pipe joint.

**D)** Identify and measure all cracks greater than 0.1" and joint separations greater than 0.5".

**E)** Video Inspections are conducted from junction to junction which defines a pipe run. A junction is defined as a headwall, drop box inlet, curb box inlet, manhole, buried junction, or other structure that disturbs the continuity of the pipe. Multiple pipe inspections may be conducted from a single set up location, but each pipe run must be on a separate video file and all locations are to be referenced from nearest junction relative to that pipe run.

**F)** Record and submit all data on the TC 64-765 and TC 64-766 forms.

**3.0 MANDREL TESTING.** Mandrel testing will be used for deflection testing. For use on Corrugated Metal Pipe, High Density Polyethylene Pipe, and Polyvinyl Chloride Pipe, use a mandrel device with an odd number of legs (9 minimum) having a length not less than the outside diameter of the mandrel. The diameter of the mandrel at any point shall not be less than the diameter specified in Section 3.6. Mandrels can be a fixed size or a variable size.

**3.1** Use a proving ring or other method recommended by the mandrel manufacturer to verify mandrel diameter prior to inspection. Provide verification documentation for each size mandrel to the Engineer.

**3.2** All deflection measurements are to be based off of the AASHTO Nominal Diameters. Refer to the chart in section 3.6.

**3.3** Begin by using a mandrel set to the 5.0% deflection limit. Place the mandrel in the inlet end of the pipe and pull through to the outlet end. If resistance is met prior to completing the entire run, record the maximum distance achieved from the inlet side, then remove the mandrel and continue the inspection from the outlet end of the pipe toward the inlet end. Record the maximum distance achieved from the outlet side.

**3.4** If no resistance is met at 5.0% then the inspection is complete. If resistance occurred at 5.0% then repeat 3.1 and 3.2 with the mandrel set to the 10.0% deflection limit. If the deflection of entire pipe run cannot be verified with the mandrel then immediately notify the Engineer.

**3.5** Care must be taken when using a mandrel in all pipe material types and lining/coating scenarios. Pipe damaged during the mandrel inspection will be video inspected to determine the extent of the damage. If the damaged pipe was video inspected prior to mandrel inspection then a new video inspection is warranted and supersedes the first video inspection. Immediately notify the Engineer of any damages incurred during the mandrel inspection and submit a revised video inspection report.

**3.6** AASHTO Nominal Diameters and Maximum Deflection Limits.

| Base Pipe Diameter | AASHTO Nominal Diameter | Max. Deflection Limit | |
|---|---|---|---|
| | | 5.0% | 10.0% |
| (inches) | (inches) | (inches) | |
| 15 | 14.76 | 14.02 | 13.28 |
| 18 | 17.72 | 16.83 | 15.95 |
| 24 | 23.62 | 22.44 | 21.26 |
| 30 | 29.53 | 28.05 | 26.58 |
| 36 | 35.43 | 33.66 | 31.89 |
| 42 | 41.34 | 39.27 | 37.21 |
| 48 | 47.24 | 44.88 | 42.52 |
| 54 | 53.15 | 50.49 | 47.84 |
| 60 | 59.06 | 56.11 | 53.15 |

**4.0 PHYSICAL MEASUREMENT OF PIPE DEFLECTION.** Alternate method for deflection testing when there is available access or the pipe is greater than 36 inches in diameter, as per 4.1. Use a contact or non-contact distance instrument. A leveling device is recommended for establishing or verifying vertical and horizontal control.

**4.1** Physical measurements may be taken after installation and compared to the AASHTO Nominal Diameter of the pipe as per Section 3.6. When this method is used, determine the smallest interior diameter of the pipe as measured through the center point of the pipe (D2). All measurements are to be taken from the inside crest of the corrugation. Take the D2 measurements at the most deflected portion of the pipe run in question and at intervals no greater than ten (10) feet through the run. Calculate the deflection as follows:

% Deflection = [(AASHTO Nominal Diameter - D2) / AASHTO Nominal Diameter] x 100%

Note: The Engineer may require that preset monitoring points be established in the culvert prior to backfilling. For these points the pre-installation measured diameter (D1) is measured and recorded. Deflection may then be calculated from the following formula:

$$\% \text{ Deflection} = [(D1 - D2) / D1] (100\%)$$

**4.2** Record and submit all data.

**5.0 DEDUCTION SCHEDULE.** All pipe deductions shall be handled in accordance with the tables shown below.

| FLEXIBLE PIPE DEFLECTION | |
|---|---|
| Amount of Deflection (%) | Payment |
| 0.0 to 5.0 | 100% of the Unit Bid Price |
| 5.1 to 9.9 | 50% of the Unit Bid Price [(1)] |
| 10 or greater | Remove and Replace [(2)] |

*[(1)] Provide Structural Analysis for HDPE and metal pipe. Based on the structural analysis, pipe may be allowed to remain in place at the reduced unit price. [(2)] The Department may allow the pipe to remain in place with no pay to the Contractor in instances where it is in the best interest to the public and where the structural analysis demonstrates that the pipe should function adequately.*

| RIGID PIPE REMEDIATION TABLE PIPE | |
|---|---|
| Crack Width (inches) | Payment |
| ≤ 0.1 | 100% of the Unit Bid Price |
| Greater than 0.1 | Remediate or Replace [(1)] |

*(1) Provide the Department in writing a method for repairing the observed cracking. Do not begin work until the method has been approved.*

**6.0 PAYMENT.** The Department will measure the quantity in linear feet of pipe to inspect. The Department will make payment for the completed and accepted quantities under the following:

| Code | Pay Item | Pay Unit |
|---|---|---|
| 24814EC | Pipeline Inspection | Linear Foot |
| 10065NS | Pipe Deflection Deduction | Dollars |

# SPECIAL NOTE FOR NON-TRACKING TACK COAT

1. DESCRIPTION AND USEAGE. This specification covers the requirements and practices for applying a non-tracking tack asphalt coating. Place this material on the existing pavement course, prior to placement of a new asphalt pavement layer. Use when expedited paving is necessary or when asphalt tracking would negatively impact the surrounding area. This material is not suitable for other uses. Ensure material can "break" within 15 minutes under conditions listed in 3.2.

2. MATERIALS, EQUIPMENT, AND PERSONNEL.

2.1 Non-Tracking Tack. Provide material conforming to Subsection 2.1.1.

2.1.1 Provide a tack conforming to the following material requirements:

| Property | Specification | Test Procedure |
|---|---|---|
| Viscosity, SFS, 77 ˚ F | 20 – 100 | AASHTO T 72 |
| Sieve, % | 0.3 max. | AASHTO T 59 |
| Asphalt Residue[1], % | 50 min. | AASHTO T 59 |
| Oil Distillate, % | 1.0 max. | AASHTO T 59 |
| Residue Penetration, 77 ˚ F | 0 - 30 | AASHTO T 49 |
| Original Dynamic Shear (G*/sin δ), 82 ˚ C | 1.0 min. | AASHTO T 315 |
| Softening Point, ˚ F | 149 min. | AASHTO T 53 |
| Solubility, % | 97.5 min. | AASHTO T 44 |

[1] Bring sample to 212 ˚F over a 10-15 minute period. Maintain 212 ˚F for 15-20 minutes or until 30-40 mL of water has distilled. Continue distillation as specified in T59.

2.2. Equipment. Provide a distributor truck capable of heating, circulating, and spraying the tack between 170 ˚F and 180 ˚F. Do not exceed 180 ˚F. Circulate the material while heating. Provide the correct nozzles that is recommend by the producer to ensure proper coverage of tack is obtained. Ensure the bar can be raised to between 14" and 18" from the roadway.

2.3. Personnel. Ensure the tack supplier has provided training to the contractor on the installation procedures for this product. Make a technical representative from the supplier available at the request of the Engineer.

3. CONSTRUCTION.

3.1 Surface Preparation. Prior to the application of the non-tracking tack, ensure the pavement surface is thoroughly dry and free from dust or any other debris that would inhibit adhesion. Clean the surface by scraping, sweeping, and the use of compressed air. Ensure this preparation process occurs shortly before application to prevent the return of debris on to the pavement. If rain is expected within one hour after application, do not apply material. Apply material only when the surface is dry, and no precipitation is expected.

3.2 Non-tracking Tack Application. Placement of non-tracking tack is not permitted from October 1st to May 15th. When applying material, ensure the roadway temperature is a minimum of 40˚F and rising. Prior to application, demonstrate competence in applying the tack according to this note to the satisfaction of the Engineer. Heat the tack in the distributor to between 170 – 180 ˚F. After the initial heating, between 170 – 180 ˚F, the material may be sprayed between 165 ˚F and 180 ˚F. Do not apply outside this temperature range. Apply material at a minimum rate of 0.70 pounds (0.08 gallons) per square yard. Ensure full coverage of the material on the pavement surface. Full coverage of this material is critical. Increase material application rate if needed to achieve full coverage. Schedule the work so that, at the end of the day's production, all non-tracking tack is covered with the asphalt mixture. If for some reason the non-tracking tack cannot be covered by an asphalt mixture, ensure the non-tracking tack material is clean and reapply the non-tracking tack prior to placing the asphalt mixture. Do not heat material more than twice in one day.

3.3 Non-tracking Tack Certification. Furnish the tack certification to the Engineer stating the material conforms to all requirements herein prior to use.

3.4 Sampling and Testing. The Department will require a sample of non-tracking tack be taken from the distributor at a rate of one sample per 15,000 tons of mix. Take two 1 gallon samples of the heated material and forward the sample to the Division of Materials for testing within 7 days. Ensure the product temperature is between 170 and 180 °F at the time of sampling.

4. MEASUREMENT. The Department will measure the quantity of non-tracking tack in tons. The Department will not measure for payment any extra materials, labor, methods, equipment, or construction techniques used to satisfy the requirements of this note. The Department will not measure for payment any trial applications of non-tracking tack, the cleaning of the pavement surface, or furnishing and placing the non-tracking tack. The Department will consider all such items incidental to the non-tracking tack.

5. PAYMENT. The Department will pay for the non-tracking tack at the Contract unit bid price and apply an adjustment for each manufacturer's lot of material based on the degree of compliance as defined in the following schedule. Non-tracking tack will not be permitted for use from October 1st to May 15th. During this timeframe, the department will allow the use of an approved asphalt emulsion in lieu of a non-tracking tack product but will not adjust the unit bid price of the material. When a sample fails on two or more tests, the Department may add the deductions, but the total deduction will not exceed 100 percent.

| Non-Tracking Tack Price Adjustment Schedule | | | | | | |
|---|---|---|---|---|---|---|
| Test | Specification | 100% Pay | 90% Pay | 80% Pay | 50% Pay | 0% Pay |
| Viscosity, SFS, 77 ˚ F | 20 – 100 | 19 - 102 | 17 - 18<br>103 - 105 | 15 - 16<br>106 - 107 | 14<br>108 - 109 | ≤13<br>≥ 110 |
| Sieve, % | 0.30 max. | ≤ 0.40 | 0.41 - 0.50 | 0.51 - 0.60 | 0.61 - 0.70 | ≥ 0.71 |
| Asphalt Residue, % | 50 min. | ≥49.0 | 48.5 – 48.9 | 48.0 – 48.4 | 47.5-47.9 | ≤ 47.4 |
| Oil Distillate, % | 1.0 max. | ≤1.0 | 1.1-1.5 | 1.6 - 1.7 | 1.8-1.9 | >2.0 |
| Residue Penetration, 77 ° F. | 30 max. | ≤ 31 | 32 - 33 | 34 - 35 | 36 - 37 | ≥ 38 |
| Original Dynamic Shear (G*/sin δ), 82 ˚ C | 1.0 min. | ≥0.95 | 0.92 – 0.94 | 0.90 – 0.91 | 0.85 - 0.89 | ≤ 0.84 |
| Softening Point, º F | 149 min. | ≥145 | 142 - 144 | 140 - 141 | 138 - 139 | ≤ 137 |
| Solubility, % | 97.5 min. | ≥ 97.0 | 96.8 – 96.9 | 96.6 – 96.7 | 96.4 – 96.5 | ≤ 96.3 |

| Code | Pay Item | Pay Unit |
|---|---|---|
| 24970EC | Asphalt Material for Tack Non-Tracking | Ton |

Revised: May 23, 2022

KENTUCKY TRANSPORTATION CABINET
Department of Highways
**DIVISION OF RIGHT OF WAY & UTILITIES**

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# RIGHT OF WAY CERTIFICATION

| ☒ Original | ☐ Re-Certification | RIGHT OF WAY CERTIFICATION | |
|---|---|---|---|
| **ITEM #** | **COUNTY** | **PROJECT # (STATE)** | **PROJECT # (FEDERAL)** |
| 12-298.40 | Pike | FD04 098 6739802R | |
| **PROJECT DESCRIPTION** | | | |
| KY 199 Spot Improvement Stone | | | |

☐ **No Additional Right of Way Required**

Construction will be within the limits of the existing right of way. The right of way was acquired in accordance to FHWA regulations under the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended. No additional right of way or relocation assistance were required for this project.

☒ **Condition # 1 (Additional Right of Way Required and Cleared)**

All necessary right 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 all improvements and enter on all land. Just Compensation has been paid or deposited with the court. All relocations have been relocated to decent, safe, and sanitary housing or that KYTC has made available to displaced persons adequate replacement housing in accordance with the provisions of the current FHWA directive.

☐ **Condition # 2 (Additional Right of Way Required with Exception)**

The right of way has 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. 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 all improvements. Just Compensation has been paid or deposited with the court for most parcels. Just Compensation for all pending parcels will be paid or deposited with the court prior to AWARD of construction contract

☐ **Condition # 3 (Additional Right of Way Required with Exception)**

The acquisition or right of occupancy and use of a few remaining parcels are not complete and/or some parcels still have occupants. All remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. KYTC is hereby requesting authorization to advertise this project for bids and to proceed with bid letting even though the necessary right of way will not be fully acquired, and/or some occupants will not be relocated, and/or the just compensation will not be paid or deposited with the court for some parcels until after bid letting. KYTC will fully meet all the requirements outlined in 23 CFR 635.309(c)(3) and 49 CFR 24.102(j) and will expedite completion of all acquisitions, relocations, and full payments after bid letting and prior to AWARD of the construction contract or force account construction.

| Total Number of Parcels on Project | 26 | EXCEPTION (S) Parcel # | ANTICIPATED DATE OF POSSESSION WITH EXPLANATION |
|---|---|---|---|
| **Number of Parcels That Have Been Acquired** | | | |
| Signed Deed | 24 | | |
| Condemnation | 2 | | |
| Signed ROE | 2 | | |

**Notes/ Comments (Text is limited. Use additional sheet if necessary.)**
Parcels 46, 88 & 103 Structures remain and to be removed by Road Contract (P46 also has a tree needing removed) ACM Sampling complete and no ACM found.

| LPA RW Project Manager | | Right of Way Supervisor | |
|---|---|---|---|
| Printed Name | | Printed Name | Joe Tackett |
| Signature | | Signature | Joe Tackett |
| Date | | Date | 6/22/2022 |
| **Right of Way Director** | | **FHWA** | |
| Printed Name | | Printed Name | |
| Signature | DM Loy Digitally signed by DM Loy Date: 2022.06.22 14:15:22 -04'00' | Signature | |
| Date | | Date | |

# UTILITIES AND RAIL CERTIFICATION NOTE

**Pike County**
**FD04 098 6739802U**
**Mile point: 9.500 TO 10.500**
**KY-199 SPOT IMPROVEMENT; RELOCATE PORTIONS OF KY-199 ALONG OLD NORFOLK SOUTHERN RAILROAD BED @ STONE. (2002BOPC)(08CCR)**
**ITEM NUMBER: 12-298.40**

## PROJECT NOTES ON UTILITIES

The contractor should be aware that there is UTILITY WORK INCLUDED IN THIS ROAD CONSTRUCTION CONTRACT. The Contractor shall review the GENERAL UTILITY NOTES AND INSTRUCTIONS which may include KYTC Utility Bid Item Descriptions, utility owner supplied specifications, plans, list of utility owner preapproved subcontractors, and other instructions. Utility contractors may be added via addendum if KYTC is instructed to do so by the utility owner. Potential contractors must seek prequalification from the utility owner. Any revisions must be sent from the utility owner to KYTC a minimum of one week prior to bid opening.

For all projects under 2000 Linear feet which require a normal excavation locate request pursuant to KRS 367.4901-4917, the awarded contractor shall field mark the proposed excavation or construction boundaries of the project (also called white lining) using the procedure set forth in KRS 367.4909(9)(k). For all projects over 2000 linear feet, which are defined as a “Large Project” in KRS 367.4903(18), the awarded contractor shall initially mark the first 2000 linear feet minimally of proposed excavation or construction boundaries of the project to be worked using the procedure set forth in KRS 367.4909(9)(k). This temporary field locating of the project excavation boundary shall take place prior to submitting an excavation location request to the underground utility protection Kentucky Contact Center. For large projects, the awarded contractor shall work with the impacted utilities to determine when additional white lining of the remainder of the project site will take place. This provision shall not alter or relieve the awarded contractor from complying with requirements of KRS 367.4905 to 367.4917 in their entirety.

Please Note: The information presented in this Utility Note is informational in nature and the information contained herein is not guaranteed.

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs. The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor’s responsibility to verify all utilities and their respective locations before excavating.

# UTILITIES AND RAIL CERTIFICATION NOTE

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**ITEM NUMBER: 12-298.40**

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. The contractor is instructed to contact KY 811 for the location of existing underground utilities. Contact shall be made a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY 811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom are to be contacted through their individual Protection Notification Center. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area. Non-compliance with these directives can result in the enforcement of penalties.

**NOTE: DO NOT DISTURB THE FOLLOWING FACILITIES LOCATED WITHIN THE PROJECT DISTURB LIMITS**

Kinzer Drilling Company - Natural Gas, Frontier Gas Company – Natural Gas

***The Contractor is fully responsible for protection of all utilities listed above**

THE FOLLOWING FACILITY OWNERS ARE RELOCATING/ADJUSTING THEIR FACILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

**N/A**

**THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE OWNER OR THEIR SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT**

SuddenLink Communications – CATV --

AT&T - KY – Telephone -

Kentucky Power Company – Electric -

# UTILITIES AND RAIL CERTIFICATION NOTE

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**All overhead utility companies have relocations to perform prior/during road construction. The location of these lines is detailed in the Special Project Notes with additional project notes and plans supplied by the Project Manager.**

**THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE ROAD CONTRACTOR AS INCLUDED IN THIS CONTRACT**

Mountain Water District – Water. There is a 8 inch waterline to be installed as part of the road contract. Plans to be made part of the proposal. See "General Notes for Utilities" for contractors list.

The prime road contractor should schedule a meeting with Mountain Water District (Roy Sawyers) prior to beginning any work. Shop drawings must be submitted/approved to Mountain Water District before beginning any work

**RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED**

☒ **No Rail Involvement** ☐ **Rail Involved** ☐ **Rail Adjacent**

## AREA FACILITY OWNER CONTACT LIST

| Facility Owner | Address | Contact Name | Phone | Email |
|---|---|---|---|---|
| AT&T - KY - Telephone | 29 Willis Branch Prestonsburg KY 41653 | Jack Salyer | 6064249328 | js2299@att.com |

# UTILITIES AND RAIL CERTIFICATION NOTE

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| | | | | |
|---|---|---|---|---|
| Kentucky Power Company - Electric | 12333 Kevin Avenue Ashland KY 41102 | Ronald Canfield | 6069291462 | rlcanfield@aep.com |
| Kinzer Drilling Company - Natural Gas | P:.O. Box 155 Allen Ky 40601 | Curtis Bostic | 6068748041 | cbostic@kinzerdrilling.com |
| Mountain Water District - Water | PO Box 3157 Pikeville KY 41502 | Roy Sawyers | 6066316165 | rsawyers@mtwater.org |
| SuddenLink Communications – CATV | 4393 Teays Valley Road, Scott Depot, WV | John Fletcher | 6156385451 | John.fletcher@alticetechservicesusa.com |
| Frontier Gas Company | Prestonsburg, Kentucky | Mike Harris | 6068862431 | Harris62407@yahoo.com |



Form Revised 6/24/16

# Standard Water Bid Item Descriptions

**W AIR RELEASE VALVE** This bid item description shall apply to all air release valve installations of every size except those defined as "Special". This item shall include the air release valve, main to valve connecting line or piping, manhole, vault, structure, access casting or doors, tapping the main, labor, equipment, excavation, proper backfill and restoration required to install the air release valve at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. All air release/vacuum valves on a project shall be paid under one bid item regardless of size. No separate pay items will be established for size variations. Only in the case of the uniqueness of a particular air release valve would a separate bid item be established. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**BOLLARDS** This item is for payment for furnishing and installing protective guard posts at above ground utility installations. A bollard may consist of, but not limited to, a steel post set in concrete or any other substantial post material. This item shall include all labor, equipment, and materials needed for complete installation of the bollard as specified by the utility owner specifications and plans. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

*NOTE: A bid code for this item has been established in standard roadway bid items and shall be used for payment of this item. The bid code is 21341ND*

**W CAP EXISTING MAIN** This item shall include the specified cap, concrete blocking and/or mechanical anchoring, labor, equipment, excavation, backfill, and restoration required to install the cap at the location shown on the plans or as directed in accordance with the specifications. This item is not to be paid on new main installations. This pay item is only to be paid to cap existing mains. Caps on new mains are incidental to the new main. Any and all caps on existing mains shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W DIRECTIONAL BORE** Payment under this item is made whenever the plans or specifications specifically show directional boring is to be utilized in order to minimize the impact of open cut for the installation of water main under streets, creeks, and etc. Payment under this item shall include the specified bore pipe, labor, and equipment. No separate payment shall be made for bore pipe installed in the bore whether used as a carrier pipe or an encasement of a separate carrier pipe. This item shall also include pipe anchors at each end of the bore when specified to prevent the creep or contraction of the bore pipe. Carrier pipe installed within a bore pipe shall be paid separately under pipe items. Payment under this item shall not be size specific and no separate bid items will be established for size variations. The bore pipe sizes to be included under this item shall be as shown on the plans and/or in the specifications. Any and all directional bores in each contract shall be paid under one directional bore bid item included in the contract regardless of size. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W ENCASEMENT CONCRETE** Includes all labor, equipment, excavation, concrete, reinforcing steel, backfill, restoration, and etc., to construct the concrete encasement of the water main as shown on the plans, and in accordance with the specifications and standard drawings. Payment under this item shall be in addition to the carrier pipe as paid under separate bid items. Carrier pipe is not included in this bid item. Any and all concrete encasement shall be paid under one bid item included in the contract regardless of the size of the carrier pipe or the volume of concrete or steel reinforcement as specified in the plans and specifications. No separate bid items will be established for size variations. Measurement of pay quantity shall be from end of concrete to end of concrete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W ENCASEMENT STEEL BORED** This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to bore and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The sizes of encasement to be paid under the size ranges specified in the bid items shall be as follows:

Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
Range 6 = All encasement sizes greater than 24 inches

*(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.)* Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W ENCASEMENT STEEL OPEN CUT** This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to open cut and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The size encasement to be paid under the size ranges specified in the bid items shall be as follows:

Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
Range 6 = All encasement sizes greater than 24 inches

*(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.)* Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W FIRE HYDRANT ADJUST** Includes all labor, equipment, excavation, materials, and backfill to adjust the existing fire hydrant using the fire hydrant manufacturer's extension kit for adjustments of 18" or less. Adjustments greater than 18" require anchoring couplings and vertical bends to adjust to grade. The Contractor will supply and install all anchor couplings, bends, fire hydrant extension, concrete blocking, restoration, granular drainage material, etc, needed to adjust the fire hydrant complete and ready for use as shown on the plans, and in accordance with the specifications and standard drawings. This also includes allowing for the utility owner inspector to inspect the existing fire hydrant prior to adjusting, contractor returning unusable fire hydrants to the utility owner warehouse and picking up a replacement hydrant. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete and ready for use.

**W FIRE HYDRANT ASSEMBLY** Includes all labor, equipment, new fire hydrant, isolating valve and valve box, concrete pad around valve box (when specified in specifications or plans), piping, anchoring tee, anchoring couplings, fire hydrant extension, excavation, concrete blocking, granular drainage material, backfill, and restoration, to install a new fire hydrant assembly as indicated on plans and on standard drawings compete and ready for use. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W FIRE HYDRANT RELOCATE** This item includes all labor and equipment to remove the existing fire hydrant from its existing location and reinstalling at a new location. This item shall include a new isolating valve and valve box, concrete pad around valve box (when required in specifications or plans), new piping, new anchoring tee, anchoring couplings, fire hydrant extensions, concrete blocking, restoration, granular drainage material, excavation, and backfill as indicated on plans, specifications, and on standard drawings compete and ready for use. This item shall also include allowing for utility owner inspector to inspect the existing fire hydrant prior to reuse, contractor returning unusable fire hydrants to the utility owner warehouse and picking up a replacement hydrant for use, if the existing fire hydrant is determined unfit for reuse. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W FIRE HYDRANT REMOVE** This bid item includes removal of an abandoned fire hydrant, isolating valve, and valve box to the satisfaction of the engineer. The removed fire hydrant, isolating valve and valve box shall become the property of the contractor for his disposal as salvage or scrap. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W FLUSH HYDRANT ASSEMBLY** This item shall include the flushing hydrant assembly, service line, tapping the main, labor, equipment, excavation, backfill, and restoration required to install the flush hydrant at the location shown on the plans and in accordance with the specifications and standard drawings, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W FLUSHING ASSEMBLY** This item shall include the flushing device assembly, service line, meter box and lid, tapping the main, labor, equipment, excavation, backfill, and restoration required to install the

flushing device at the location shown on the plans and in accordance with the specifications and standard drawings, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W LEAK DETECTION METER** This item is for payment for installation of a water meter at main valve locations where shown on the plans for detection of water main leaks. The meter shall be of the size and type specified in the plans or specifications. This item shall include all labor, equipment, meter, meter box or vault, connecting pipes between main and meter, main taps, tapping saddles, casting, yoke, and any other associated material needed for installation of a functioning water meter in accordance with the plans and specifications, complete and ready for use. No separate payment will be made under any other contract item for connecting pipe or main taps. Any and all leak detection meters shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete and ready for use.

**W LINE MARKER** This item is for payment for furnishing and installing a water utility line marker as specified by the utility owner specifications and plans. A line marker may consist of a post or monument of whatever materials specified and shall include markings and/or signage on same as specified by plans or specifications. This item shall include all labor, equipment, and materials needed for complete installation of the marker. This item shall be paid EACH (EA) when complete.

**W MAIN POINT RELOCATE** This item is intended for payment for horizontal and/or vertical relocation of a short length of an existing main at the locations shown on the plans. This bid item is to be used to relocate an existing water main at point locations such as to clear a conflict at a proposed drainage structure, pipe or any other similar short relocation situation, and where the existing pipe material is to be reused. The contractor shall provide any additional pipe or fitting material needed to complete the work as shown on the plans and specifications. The materials provided shall be of the same type and specification as those that exist. Substitution of alternative materials shall be approved by the engineer in advance on a case by case basis. New polyethylene wrap is to be provided (if wrap exists or is specified in the specifications to be used). If it is necessary that the pipe be disassembled for relay, payment under this item shall also include replacement of joint gaskets as needed. Bedding and backfill shall be provided and performed the same as with any other pipe installation as detailed in the plans and specifications. Payment under this item shall be for each location requiring an existing main to be relocated horizontally or vertically regardless of pipe size or relocation length. No separate pay items will be established for pipe size variations or relocation segment length variations. Water Main Relocate shall not be paid on a linear feet basis; but, shall be Paid EACH (EA) at each location when complete and placed in service. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

**W METER** This item is for payment for installation of all standard water meters of all sizes 2 inches ID or less as specified on the plans. This item shall include all labor, equipment, meter, meter box, casting, yoke, and any other associated material needed for installation of a functioning water meter in accordance with the plans and specifications, complete and ready for use. This item shall include connections to the new or existing water service line. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W METER ADJUST** This item includes all labor, equipment, excavation, materials, backfill, restoration, and etc., to adjust the meter casting to finished grade (whatever size exists) at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W METER RELOCATE** This item includes all labor, equipment, excavation, additional fittings, disinfection, testing, restoration, and etc., to relocate the existing water meter (whatever size exists), meter yoke, meter box, casting, and etc., from its old location to the location shown on the plans or as directed, in accordance with the specifications and standard drawings complete and ready for use. The new service pipe (if required) will be paid under short side or long side service bid items. Any and all meter relocations of 2 inches or less shall be paid under one bid item included in the contract regardless of size. Each individual relocation shall be paid individually under this item; however, no separate bid items will be established for meter size variations of 2 inches ID or less. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W METER VAULT SIZE RANGE 1 OR 2** This item is for payment for installation of an underground structure for housing of a larger water meter, fittings, and valves as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or access doors, the specified meter(s) valve(s), all piping, and fitting materials associated with installing a functioning meter and vault in accordance with the plans, standard drawings, and specifications, complete and ready for use. The size shall be the measured internal diameter of the meter and piping to be installed. The size meter vault to be paid under size 1 or 2 shall be as follows:

Size Range 1 = All meter and piping sizes greater than 2 inches up to and including 6 inches
Size Range 2 = All meter and piping sizes greater than 6 inches

This item shall be paid EACH (EA) when complete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

**W METER/FIRE SERVICE COMBO VAULT** This item is for payment for installation of an underground structure for housing of a water meter and fire service piping, fittings, and valves as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or access doors, the specified meter(s), valve(s), all piping, and fitting materials associated with installing a functioning meter and fire service vault in accordance with the plans and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W METER WITH PRESSURE REDUCING VALVE (PRV)** This item is for payment for installation of all standard water meters with pressure reducing valves (PRV) of all sizes 2 inches ID or less as specified on the plans. This item shall include all labor, equipment, meter, PRV, meter box, casting, yoke, and any other associated material needed for installation of a functioning water meter with PRV in accordance with the plans and specifications, complete and ready for use. This item shall include connections to the new or existing water service line. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

This item shall be paid EACH (EA) when complete.

**W PIPE** This description shall apply to all PVC, ductile iron, and polyethylene/plastic pipe bid items of every size and type to be used as water main, except those bid items defined as "Special". This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, sanitizing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. This item shall include all temporary and permanent materials and equipment required to pressure test and sanitize mains including, but not limited to, pressurization pumps, hoses, tubing, gauges, main taps, saddles, temporary main end caps or plugs and blocking, main end taps for flushing, chlorine liquids or tablets for sanitizing, water for testing/sanitizing and flushing (when not supplied by the utility), chlorine neutralization equipment and materials, and any other items needed to accomplish pressure testing and sanitizing the main installation. This item shall also include pipe anchors, at each end of polyethylene pipe runs when specified to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W PLUG EXISTING MAIN** This item shall include the specified plug, concrete blocking and/or anchoring, labor, equipment, excavation, backfill, and restoration required to install the plug in an existing in-service main that is to remain at the location shown on the plans or as directed in accordance with the specifications. Any and all plugs on all existing in-service mains shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

*NOTE: This utility bid item is not to be paid on new main installations or abandoned mains. This pay item is to plug existing in-service mains only. Plugs on new mains are incidental to the new main just like all other fittings.*

*NOTE: Plugging of existing abandon mains shall be performed and paid in accordance with Section 708.03.05 of KYTC Standard Specifications For Road And Bridge Construction and paid using Bid Code 01314 Plug Pipe.*

**W PRESSURE REDUCING VALVE** This description shall apply to all pressure reducing valves (PRV) of every size required in the plans and specifications except those bid items defined as "Special". Payment under this description is to be for PRVs being installed with new main. This item includes the PRV as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), pit or vault, backfill, restoration, testing, disinfection, and etc., required to install the specified PRV at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, PRVs shall be restrained. PRV restraint shall be considered incidental to the

PRV and adjoining pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W PUMP STATION** This item is for payment for installation of pumps and an above or below ground structure for housing of the pumps. This item shall include all pumps, piping, fittings, valves, electrical components, building materials, concrete, any other appurtenances, labor, equipment, excavation, and backfill, to complete the pump station installation as required by the plans, standard drawings, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LUMP SUM (LS) when complete.

**W REMOVE TRANSITE (AC) PIPE** This item shall include all labor, equipment, and materials needed for removal and disposal of the pipe as hazardous material. All work shall be performed by trained and certified personnel in accordance with all environmental laws and regulations.
Any and all transite AC pipe removed shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W SERVICE LONG SIDE** This bid item description shall apply to all service line installations of every size bid up to and including 2 inch inside diameter, except those service bid items defined as "Special". This item includes the specified piping material, main tap, tapping saddle (if required), and corporation stop materials, coupling for connecting the new piping to the surviving existing piping, encasement of 2 inches or less internal diameter (if required by plan or specification), labor, equipment, excavation, backfill, testing, disinfection, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service installations where the ends of the service connection are on opposite sides of the public roadway and the service line crosses the centerline of the public roadway as shown on the plans. The length of the service line is not to be specified. Payment under this item shall not be restricted by a minimum or maximum length. The contractor shall draw his own conclusions as to the length of piping that may be needed. Payment under this item shall include boring, jacking, or excavating across the public roadway for placement. Placement of a service across a private residential or commercial entrance alone shall not be reason to make payment under this item. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. This pay item does not include installation or relocation of meters. Meters will be paid separately. No additional payment will be made for rock excavation or for special bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W SERVICE SHORT SIDE** This bid item description shall apply to all service line installations of every size up to and including 2 inch internal diameter, except those service bid items defined as "Special". This item includes installation of the specified piping material of the size specified on plans, encasement of 2 inches or less internal diameter (if required by plan or specification), main tap, tapping saddle (if required), corporation stop, coupling for connecting the new piping to the surviving existing piping, labor, equipment, excavation, backfill, testing, disinfection, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and

ready for use. This bid item is to pay for service installations were both ends of the service connection are on the same side of the public roadway, or when an existing service crossing a public roadway will remain and is being extended, reconnected, or relocated with all work on one side of the public roadway centerline as shown on the plans. The length of the service line is not to be specified and shall not be restricted to any minimum or maximum length. Payment shall be made under this item even if the service crosses a private residential or commercial entrance; but, not a public roadway.
Private or commercial entrances shall not be considered a public roadway in defining payment under this item. The contractor shall draw his own conclusions as to the length of piping that may be needed. This pay item does not include installation or relocation of meters. Meters will be paid separately. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W SERVICE RELOCATE** This item is for the relocation of an existing water service line where a meter is not involved, and where an existing service line can easily be adjusted by excavating alongside and moving the line horizontally and/or vertically a short distance without cutting the service line to avoid conflicts with road construction. This item shall include excavation, labor, equipment, bedding, and backfill to relocate the line in accordance with the plans and specifications complete and ready for use. Payment under this item shall be for each location requiring relocation. Payment shall be made under this item regardless of service size or relocation length. No separate pay items will be established for size or length variation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W STRUCTURE ABANDONMENT** This item is to be used to pay for abandonment of larger above or below ground water structures such as meter vaults, fire pits, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to water construction, (i.e., abandonment of standard water meters up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted fill or flowable fill for abandonment of the structure in place and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W STRUCTURE REMOVAL** This item is to be used to pay for removal of larger above or below ground water structures such as meter vaults, fire pits, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to water construction, (i.e., removal of standard water meters up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted backfill for removal of the structure and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W TAPPING SLEVE AND VALVE SIZE 1 OR 2** This item shall include the specified tapping sleeve, valve, valve box, concrete pad around valve box (when required in specifications or plans), labor, and equipment to install the specified tapping sleeve and valve, complete and ready for use in accordance with

the plans and specifications. The size shall be the measured internal diameter of the live pipe to be tapped. The size tapping sleeve and valve to be paid under sizes 1 or 2 shall be as follows:

Size 1 = All live tapped main sizes up to and including 8 inches
Size 2 = All live tapped main sizes greater than 8 inches

Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W TIE-IN** This bid description shall be used for all main tie-in bid items of every size except those defined as "Special". This item includes all labor, equipment, excavation, fittings, sleeves, reducers, couplings, blocking, anchoring, restoration, disinfection, testing and backfill required to make the water main tie-in as shown on the plans, and in accordance with the specifications complete and ready for use. Pipe for tie-ins shall be paid under separate bid items. This item shall be paid EACH (EA) when complete.

**W VALVE** This description shall apply to all valves of every size required in the plans and specifications except those bid items defined as "Special". Payment under this description is to be for gate or butterfly valves being installed with new main. This item includes the valve as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), valve box and valve stem extensions, backfill, concrete pad around valve box (if required by specification), restoration, testing, disinfection, and etc., required to install the specified valve at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, valves shall be restrained. Valve restraint shall be considered incidental to the valve and adjoining pipe. This description does not apply to cut-in valves. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W VALVE ANCHOR EXISTING** This bid item is intended to pay for installation of restraint hardware on an existing valve where no restraint exists to hold the valve in place to facilitate tie-ins and other procedures where restraint is prudent. This work shall be performed in accordance with water specifications and plans. This bid item shall include all labor equipment, excavation, materials and backfill to complete restraint of the designated valve, regardless of size, at the location shown on the plans, complete and ready for use. Materials to be provided may include, but is not limited to, retainer glands, lugs, threaded rod, concrete, reinforcing steel or any other material needed to complete the restraint. Should the associated valve box require removal to complete the restraint, the contractor shall reinstall the existing valve box, the cost of which shall be considered incidental to this bid item. No separate bid items are being provided for size variations. All sizes shall be paid under one bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W VALVE BOX ADJUST** Includes all labor, equipment, valve box and valve stem extensions (if required), excavation, backfill, concrete pad around valve box (when specified in specifications or plans), restoration, and etc., to adjust the top of the box to finished grade complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W VALVE CUT-IN** This bid description is for new cut-in valve installations of all sizes where installation is accomplished by cutting out a section of existing main. This item shall include cutting the existing pipe, supplying the specified valve, couplings or sleeves, valve box, concrete pad around valve box (when required in specifications or plans), labor, equipment, and materials to install the valve at the locations shown on the plans, or as directed by the engineer, complete and ready for use. Any pipe required for installation shall be cut from that pipe removed or supplied new by the contractor. No separate payment will be made for pipe required for cut-in valve installation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W VALVE VAULT** This item is for payment for installation of an underground structure for housing of specific valve(s) as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or doors, the specified valve(s), all piping, and fitting materials associated with installing a functioning valve vault in accordance with the plans, standard drawing, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

# SECTION II

# TECHNICAL SPECIFICATIONS

# GENERAL PROVISIONS

## 2.1 SCOPE

This section of the technical specifications is prepared to establish general requirements applicable to the entire Project. All items discussed herein are considered incidental to the overall accomplishment of the Project and no separate payment shall be made for these items.

## 2.2 IDENTIFICATION OF PARTIES

OWNER - The Mountain Water District.
The OWNER owns and is responsible for the completed wastewater facilities.

ENGINEER - Registered professional engineer designated by OWNER to provide design, construction inspection, and certification services.

CONTRACTOR- The entity(s) responsible under contract to OWNER to furnish labor, equipment, etc. to complete the work specified herein.

## 2.3 RECORD DRAWINGS

The CONTRACTOR shall furnish record drawings in accordance with the requirements of the 'Submittals' section of these specifications.

## 2.4 EXISTING UTILITIES AND UNDERGROUND FACILITIES

Attention is called to the presence of existing utilities and underground facilities. The CONTRACTOR is solely responsible to accurately locate, and avoid damage to, all existing utilities and underground facilities. See "Existing Utilities" herein.

## 2.5 SCHEDULES

2.5.1 Progress and Payment Schedules. Within 10 calendar days of Notice of Award, prepare and submit to the ENGINEER a proposed construction progress schedule. The schedule shall be in the form of a bar chart addressing the major project activities. The bar chart shall provide for a comparison of the proposed schedule to actual completion.

2.5.2 Submittal Schedules. Within 10 calendar days of Notice of Award, prepare and submit to the ENGINEER a proposed submittal schedule (See paragraph 26 of General Conditions).

2.5.3 Schedule Updates. All project schedules shall be updated for each CONTRACTOR pay request.

2.5.4 WARNING: NO CONTRACTOR PAYMENTS SHALL BE APPROVED BY THE ENGINEER UNTIL ACCEPTABLE PROJECT SCHEDULES HAVE BEEN PROVIDED BY THE CONTRACTOR. CONTRACTOR PAY REQUEST APPLICATIONS WILL BE IMMEDIATELY RETURNED IF THEY ARE NOT ACCOMPANIED BY THE REQUIRED SCHEDULE UPDATES.

## 2.6 STAKING AND MARKING

The ENGINEER will be responsible for providing the survey reference monuments and benchmarks. Construction stakeout and "as built" surveys shall be the responsibility of the CONTRACTOR.

## 2.7 CONSTRUCTION PHOTOGRAPHS

2.7.1 The term "photograph" as used herein refers to a photographic view, including similar exposures taken to assure the usefulness of the photographic record. All photographs shall be taken in color, not black and white.

2.7.2 The CONTRACTOR shall photograph the project limits prior to construction. The same views shall be re-photographed upon completion of all construction activities. In lieu of photography, CONTRACTOR may opt to video the project limits. The CONTRACTOR shall furnish the ENGINEER two copies of this video cassette for a completeness review. NO WORK CAN BE PERFORMED UNTIL THE ENGINEER HAS REVIEWED, AND ACCEPTED, THE PRE-CONSTRUCTION PHOTOGRAPHS AND/OR VIDEOS.

2.7.3 The CONTRACTOR shall have an average of ten (10) photographs per month made of the work during its progress and twenty (20) photographs of the completed facilities, in addition to those required above in paragraph 2.7.2.

2.7.4 All photographic work shall be done by a qualified, established photographer acceptable to the ENGINEER. Two prints of each photograph shall be provided.

2.7.5 The film negatives shall be retained in the files of the photographer until the completion of the project and shall then be turned over to the ENGINEER. The photographer shall release all copyrights, or other restrictions, on the use of the photographic prints and film negatives.

2.7.6 Each photograph shall have an identification label which provides:

1. Contractor's name
2. Short Description of View
3. Photo No. and Date Taken
4. Photographer's Firm Name

**2.8 TESTING**

The cost of all testing shall be borne by the CONTRACTOR unless directed otherwise.

**2.9 INSTALLATION REQUIREMENTS**

Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as suggested by the respective manufacturers, unless otherwise specified herein.

**2.10 PROOF OF COMPLIANCE**

See Quality Control - Section IV

**2.11 MAINTAINING DRAINAGE**

At no time shall the flow of any existing streams or gullies be blocked. Ditches or culverts which become inoperable during the work effort shall be promptly cleaned out.

**2.12 DUST AND LITTER CONTROL**

All access roads, excavations, embankments, waste areas, etc. within the project boundaries shall be maintained free of dust and litter which could cause a nuisance to others. Dust control shall be performed as the work proceeds and whenever a dust nuisance occurs. From time to time, as the need arises, the construction area shall be policed to collect all scattered litter and debris.

**2.13 CLEAN UP**

After all construction work is complete, and prior to final inspection, all disturbed areas shall be cleaned and left in a sightly condition. All unused material shall be removed and disposed of properly.

**2.14 REPAIR OF DAMAGE**

Any damage done to structures, fills, roadways, or other areas shall be repaired at the CONTRACTOR'S expense before final payment is made.

**2.15 PROJECT LIMITS**

The CONTRACTOR shall be responsible for satisfying himself as to the construction limits for the project. The CONTRACTOR shall not establish work, storage, or staging areas outside the project limits, unless otherwise directed or approved by the ENGINEER.

**2.16 BURNING**

There shall be no burning on this Project.

**2.17 MATERIALS SUITABLY STORED**

Request for payment for stored materials MUST be prepared in compliance with Paragraph 14.02 of the General Conditions.

**2.18 EXPLANATION OF MEASUREMENT AND PAYMENT TERMINOLOGY**

The various items of work will be measured and paid for as "Lump Sum," "Each," or by "Unit Prices" as established in these specifications. These methods of payment are defined as follows:

a) Lump Sum: When this term is used as an item of payment, it shall be inferred that the complete structure, structural unit or element of work is specified as the unit measurement. As such, it will be construed to include all necessary materials and accessories required for installation. No final measurements will be made.

b) Each: The definition for Lump Sum applies to the term "each" except more than one may be included in the Project and the actual number installed will be the final measurement.

2.7.6 Each photograph shall have an identification label which provides:

1. Contractor's name
2. Short Description of View
3. Photo No. and Date Taken
4. Photographer's Firm Name

**2.8 TESTING**

The cost of all testing shall be borne by the CONTRACTOR unless directed otherwise.

**2.9 INSTALLATION REQUIREMENTS**

Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as suggested by the respective manufacturers, unless otherwise specified herein.

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See Quality Control - Section IV

**2.11 MAINTAINING DRAINAGE**

At no time shall the flow of any existing streams or gullies be blocked. Ditches or culverts which become inoperable during the work effort shall be promptly cleaned out.

**2.12 DUST AND LITTER CONTROL**

All access roads, excavations, embankments, waste areas, etc. within the project boundaries shall be maintained free of dust and litter which could cause a nuisance to others. Dust control shall be performed as the work proceeds and whenever a dust nuisance occurs. From time to time, as the need arises, the construction area shall be policed to collect all scattered litter and debris.

**2.13 CLEAN UP**

After all construction work is complete, and prior to final inspection, all disturbed areas shall be cleaned and left in a sightly condition. All unused material shall be removed and disposed of properly.

## 2.14 REPAIR OF DAMAGE

Any damage done to structures, fills, roadways, or other areas shall be repaired at the CONTRACTOR'S expense before final payment is made.

## 2.15 PROJECT LIMITS

The CONTRACTOR shall be responsible for satisfying himself as to the construction limits for the project. The CONTRACTOR shall not establish work, storage, or staging areas outside the project limits, unless otherwise directed or approved by the ENGINEER.

## 2.16 BURNING

There shall be no burning on this Project.

## 2.17 MATERIALS SUITABLY STORED

Request for payment for stored materials MUST be prepared in compliance with Paragraph 14.02 of the General Conditions.

## 2.18 EXPLANATION OF MEASUREMENT AND PAYMENT TERMINOLOGY

The various items of work will be measured and paid for as "Lump Sum," "Each," or by "Unit Prices" as established in these specifications. These methods of payment are defined as follows:

a) Lump Sum: When this term is used as an item of payment, it shall be inferred that the complete structure, structural unit or element of work is specified as the unit measurement. As such, it will be construed to include all necessary materials and accessories required for installation. No final measurements will be made.

b) Each: The definition for Lump Sum applies to the term "each" except more than one may be included in the Project and the actual number installed will be the final measurement.

c) Unit Price Quantities: When unit price quantities for a specific portion of the project are designated in the Contract Documents as the pay quantity, actual quantities for such specified portion serve as the basis for payment. Actual quantities shall be determined by the differences in measurements taken before and after construction.

d) Plan Quantities: When the specifications indicate that 'Plan Quantities' are the basis of payment, the design quantities enumerated on the bid schedule shall be the final pay quantity unless the related dimensions in the Drawings are revised by the Engineer.

**-- THE END --**

# SECTION III

# TECHNICAL SPECIFICATIONS

# SUBMITTALS

## 3.1 SCOPE

This specification sets forth the procedure to be employed in submitting and processing all CONTRACTOR submittals.

## 3.2 SHOP DRAWINGS

3.2.1 The CONTRACTOR shall submit for the review of the ENGINEER Shop Drawings for all fabricated work and for all manufactured items required to be furnished in the Contract in accordance with the General Conditions and as specified herein. Shop Drawings shall be submitted in sufficient time to allow at least twenty-one (21) calendar days after receipt of the Shop Drawings from the CONTRACTOR for checking and processing by the ENGINEER.

3.2.2 ENGINEER's review of the CONTRACTOR's drawings shall be considered as a gratuitous service, given as assistance to the CONTRACTOR in interpreting the requirements of the Contract, and in no way shall it relieve the CONTRACTOR of any of his responsibilities under the Contract. Any fabrication, erection, setting or other Work done in advance of the receipt of Shop Drawings returned by the ENGINEER and noted as "Approved" or "Approved as Noted" shall be entirely at the CONTRACTOR's risk. The ENGINEER's review will be confined to general arrangement and compliance with the design concept and Specifications only, and will not be for the purpose of checking dimensions, weights, clearances, fitting, tolerances, interferences, coordination of trades, etc.

3.2.3 Unless otherwise stated elsewhere in the Contract Drawings, a total of six (6) copies of all reviewed Shop Drawings shall be furnished to the ENGINEER for his use in accordance with the following sequence of operations:

A) Initially six copies and one (1) reproducible copy shall be submitted to the Engineer for review. The ENGINEER will return one (1) copy and the reproducible copy to the CONTRACTOR after review.

B) When Shop Drawings are returned for correction, they shall be immediately corrected and resubmitted for review as described above, and such procedures will not be considered as grounds for delay in completing the Work.

C) Shop Drawings submitted by subcontractors shall be sent directly to the CONTRACTOR for preliminary checking. The CONTRACTOR shall be responsible for their submission to the ENGINEER at the proper time so as to prevent delays in delivery of materials.

D) The CONTRACTOR shall thoroughly check all subcontractors Shop Drawings as regards to measurements, sizes of members, materials and details to satisfy himself that they conform to the intent of the Specifications. Drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors by the CONTRACTOR for correction before submitting them to the ENGINEER. Before submission, the CONTRACTOR shall mark (stamp) the drawings as being checked and approved by him, dated and signed. The CONTRACTOR's approval (stamp) shall constitute a representation that all quantities, dimensions, field construction criteria, materials, catalog numbers, performance criteria and similar data have been verified and that, in his opinion, the submittal fully meets the requirements of the Contract Documents and the scope of work involved. Shop Drawings that are not stamped will not be reviewed.

E) All details on Shop Drawings submitted for review shall clearly show the relation of the various parts and where the Work depends upon field measurements, such measurements shall be obtained by the CONTRACTOR and noted on the Shop Drawings before being submitted to the ENGINEER for review.

F) All submissions shall be properly referenced to indicate clearly the specification section, location, service and function of each particular item. All submissions for one item or group of related items shall be complete. The ENGINEER reserves the right to reject manufacturer's publications in the form of catalogues, pamphlets, or other data sheets when they are submitted in lieu of prepared Shop Drawings. Such submissions

shall specifically indicate the item for which approval is requested. Identification of items shall be made in ink, and submissions showing only general information are not acceptable.

G) If the Shop Drawings contain any departures from the Contract requirements, specific mention thereof shall be made in the CONTRACTOR's letter of transmittal. Where such departures require revisions to layouts or structural changes to the Work, the CONTRACTOR shall, at his own expense, prepare and submit for approval revised layout and structural drawings. Such drawings shall be of the size approved by the ENGINEER.

H) All shop drawings shall be in English.

3.2.4 The ENGINEER will review the first and second shop drawing submittals at no cost to the CONTRACTOR. Review of the third submittal and any subsequent submittal will be at the CONTRACTOR's expense. Payment will be deducted from the Contract amount at a rate of 3 times direct labor cost plus expense.

## 3.3 RECORD DRAWINGS

3.3.1 The Record Drawings shall consist of the Contract Drawings (3 mil Mylar, updated to 'As Built' conditions) and the approved Shop Drawings in reproducible form (3 mil Mylar) and shall be submitted to the ENGINEER at any time upon request during construction, but no later than the Final Inspection.

3.3.2 Contract Drawings shall be legibly marked to record actual construction including:

A) All deviations in location or elevation of any underground installation from that shown on the Contract Drawings.

B) Any significant changes in above ground installation from approved Shop Drawings or Contract Drawings.

C) No such deviations from the Contract Drawings or approved Shop Drawings shall be made without approval by the ENGINEER.

3.3.3 Specifications and addenda shall be legibly marked up to record:

A) Manufacturer, trade name, catalog number, and Supplier of each product and item of equipment actually installed.

B) Changes made by Change Order or Field Order.

C) Other matters not originally specified.

3.3.4 Shop Drawings shall be legibly annotated to record changes made after review.

3.3.5 Reproducible Record Drawings shall be submitted in accordance with the General Conditions, Supplementary Conditions, and General Requirements.

## 3.4 MEASUREMENT AND PAYMENT

Submittals shall be considered a part of CONTRACTOR'S Lump Sum Bid for "Mobilization/DeMobilization" and shall not be measured for separate payment.

**-- THE END --**

# SECTION IV

# TECHNICAL SPECIFICATIONS

# QUALITY CONTROL

## 4.1 CODES, STANDARDS AND INDUSTRY SPECIFICATIONS

A) Material or operations specified by reference to published specifications of a manufacturer, testing agency, society, association or other published standards shall comply with requirements in latest revisions thereof and amendments or supplements thereto in effect on date of Advertisement for Bidders.

B) Discrepancies between referenced codes, standards, specifications and Contract Documents shall be governed by the latter unless written interpretation is obtained from ENGINEER.

C) Material or work specified by reference to conform to a standard, code, law, or regulation shall be governed by Contract Document when they exceed requirements of such references; referenced standards shall govern when they exceed Contract Documents.

D) Proof of Compliance:

Whenever Contract Documents require that a product be in accordance with Federal Specification, ASTM designation, ANSI specification, or other association standard, at ENGINEER'S request, CONTRACTOR shall present an affidavit from manufacturer certifying that product complies therewith. Where requested or specified, submit supporting test data to substantiate.

## 4.2 MANUFACTURER'S DIRECTIONS

Utilize manufactured articles, materials and equipment as directed by manufacturers unless herein specified to contrary. Discrepancy between an installation required by Contract Documents and manufacturer's instructions and recommendations shall be resolved by ENGINEER before work may proceed. In all cases, the more stringent requirements shall govern.

## 4.3 TESTING

A) All testing (when required) will be in accordance with the pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

B) The OWNER will select the testing laboratories.

C) The CONTRACTOR will bear the cost of all testing unless directed otherwise.

**-- THE END --**

# SECTION V

# TECHNICAL SPECIFICATIONS

# TEMPORARY FACILITIES

## 5.1 SUBMITTALS

Submit six copies of the following:

A) A 'temporary facilities plan' illustrating the location of the field office, sanitary facilities, layoff areas, and project signs. Plan to include a floor plan for ENGINEER'S field office and furnishings.

B) The proposed layout/color scheme for the Project Sign.

## 5.2 FIELD OFFICE

5.2.1. The CONTRACTOR shall furnish and maintain a field office on site. The office shall be established at a location approved by the ENGINEER. **AN AUTHORIZED REPRESENTATIVE OF THE CONTRACTOR SHALL BE IN THE FIELD OFFICE AT ALL TIMES WHILE WORK IS IN PROGRESS.**

5.2.2. The CONTRACTOR shall provide a field office for the duration of the Project. It shall be weathertight, have a tight floor, and suitable ventilation. The office shall have at least three screened windows capable of being opened, a screen door and a solid door provided with cylinder lock and three keys. The office shall be provided with heating equipment, electrical wiring, outlets and fixtures suitable to lighten the tables and desk adequately as directed. The CONTRACTOR shall furnish and equip the field office complete within five (5) days of Notice to Proceed.

5.2.3. The field office provided shall be furnished by the CONTRACTOR as follows:

1. One plan table, 3 ft. x 5 ft. and one stool
2. Three additional chairs
3. Four-drawer, filing cabinet with lock
4. Waste paper basket
5. Air Conditioner (12,000 BTU)

5.2.4. The CONTRACTOR shall supply all fuel for heating and pay all electrical bills. A watt-hour meter shall be installed for determination of electric consumption and appropriate charges for that consumption.

5.2.5. The CONTRACTOR shall furnish the field office with a private telephone for the ENGINEER's exclusive use. With the exception of charges for long distance and toll calls, the CONTRACTOR shall pay all bills charged against the ENGINEER's telephone, including installation charge and all monthly charges throughout the construction period.

**5.3 MATERIAL STORAGE**

The CONTRACTOR must make arrangements for his staging areas and areas of material storage.

**5.4 SANITARY FACILITIES**

The CONTRACTOR shall provide and maintain all necessary sanitary facilities at the site, in accordance with all applicable regulations, and shall properly remove same at completion of the project.

**5.5 UTILITIES**

The obtaining of all utilities which may be required for the construction shall be the responsibility of the CONTRACTOR.

**5.6 PROJECT SIGN**

The CONTRACTOR shall furnish and install two project signs. One sign shall be in reasonable conformance to the one included in the PROJECT FORMS. The second sign shall reasonably conform to the size and dimensions shown on Figure 1.

**5.6 SAFETY**

CONTRACTOR shall comply with all pertinent provisions of Kentucky Safety Standards of Division of Occupational Safety, Department of Labor, and Federal Occupational Safety and Health Construction Standards, that are in effect at time this Contract is entered into and during period in which Contract is to be performed.

**5.7 MEASUREMENT AND PAYMENT**

Provision of temporary facilities shall be considered a part of CONTRACTOR'S Lump Sum Bid for "Mobilization/DeMobilization" and shall not be measured for separate payment.

**-- THE END --**

# SECTION VI

# TECHNICAL SPECIFICATIONS

# MOBILIZATION/DEMOBILIZATION

## 6.1 SCOPE

This element of work shall consist of the mobilization of the CONTRACTOR'S forces and equipment necessary for performing the work required under the Contract.

It shall include the purchase of contract bonds (including KTC encroachment permit bond); transportation of personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other temporary facilities at the site; development of submittals and record drawings in accordance with Section III of these specifications; and other preparatory and incidental work.

This specification covers mobilization for work required by the Contract at the time of award. If additional mobilization costs are incurred during performance of the Contract as a result of changes or added items of adjustment in contract price, compensation for such costs will be included in the price adjustment for the items of work changed or added.

## 6.2 PAYMENT

THE CONTRACTOR'S LUMP SUM BID FOR MOBILIZATION/DEMOBILIZATION MAY NOT EXCEED THREE PERCENT (3%) OF THE TOTAL BASE BID FOR THIS CONTRACT. Payment of the total lump sum price for "Mobilization/ DeMobilization" will constitute full compensation for all labor, materials, equipment, and all other items necessary for and incidental to completion of the work. If the CONTRACTOR elects to demobilize and remobilize before completion of the work, no additional payment will be made.

Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

Fifty percent (50%) of the "Mobilization/Demobilization" price may be invoiced when the following conditions have been met:

1) the field office and sanitary facilities are in-place;

2) the CONTRACTOR has furnished the bond for the Kentucky Department of Highways Encroachment Permit in the name of the OWNER; (Contract 1 _____,);

3) the CONTRACTOR's project schedules (construction, payment, and submittals) have been approved by the ENGINEER;

4) the CONTRACTOR has furnished a plan for disposal of waste materials;

5) the Project Sign has been erected; and

6) all project silt controls have been installed.

The remaining fifty percent of "Mobilization/DeMobilization may **not** be invoiced until the CONTRACTOR has submitted acceptable 'Record Drawings' (As-Built Plans and Shop Drawings) in accordance with the requirements of Section III of these specifications.

**-- THE END --**

# SECTION VII

# TECHNICAL SPECIFICATIONS

# MAINTAIN & CONTROL TRAFFIC

## 7.1 SCOPE

The purpose of this section is to outline the requirements for maintenance and control of traffic during construction.

## 7.2 QUALITY CONTROL

The Contractor's traffic control activities shall conform to the AASHTO Manual of Uniform Traffic Control Devices, the Kentucky Department of Highways publication "Standard Drawings", and to the requirements of Section 107 of the current edition of the Kentucky Department of Highways publication "Standard Specifications for Road and Bridge Construction."

## 7.3 CLOSING OF STREETS

It is understood that the construction activities may require the closure of certain streets within the Project Limits. The Contractor shall erect Detour signs when an alternate route is available at the intersections to inform motorists of the closures. If no alternate is available then the CONTRACTOR shall abide by KYDOH standards in stoppage of traffic. Appropriate barricades shall be erected to prevent traffic from entering the Project Limits when necessary.

In the event that the Owner does not secure right of access to the entire Project Area, access shall be maintained at all times for residents and emergency vehicles.

## 7.4 MEASUREMENT AND PAYMENT

"Maintain & Control Traffic" shall be considered a necessary and integral part of the Work and shall not be measured for separate payment. "Maintain & Control Traffic" shall be incidental to "Mobilization/Demobilizaton".

--- THE END ---

# SECTION VIII

# TECHNICAL SPECIFICATIONS

# CONSTRUCTION STAKING

## 8.1 SCOPE

The CONTRACTOR shall furnish all necessary personnel and equipment to provide all customary construction surveys including, but not limited to, the following:

a) Establish right-of-way and construction easement limits.

b) Establish the project construction centerlines

c) Provide adequate reference points to permit prompt re-establishment of the construction centerline throughout the construction.

d) Grade staking

e) Structure staking

f) Establish final "as-built" plan and profile location of all completed facilities and depict same on record drawings.

The CONTRACTOR's staking (survey) party shall be under the general supervision of an ENGINEER registered in the State of Kentucky. IT SHALL BE UNDERSTOOD THAT SUPERVISION OF THE CONSTRUCTION STAKING PARTY IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR AND ANY ERRORS AND INACCURACIES RESULTING FROM THE OPERATIONS OF THE CONSTRUCTION STAKING PARTY SHALL BE CORRECTED AT **NO** COST TO THE OWNER, OR SUMMIT ENGINEERING, INC., IF SUMMIT ENGINEERING, INC. IS NOT THE ONE DOING THE SUPERVISING.

## 8.2 SUBMITTALS

Upon completion of the project, the CONTRACTOR shall submit the following to the ENGINEER:

a) the field notes,

b) 'as built' plans on Mylar media, of no less scale than the design drawings depicting the "as built" plan and profile location of all constructed facilities.

## 8.3 MEASUREMENT AND PAYMENT

"Construction Staking" shall be considered a necessary and integral part of the Work and shall not be measured for separate payment. "Construction Staking" shall be incidental to "Mobilization /DeMobilization."

**-- THE END --**

# SECTION IX

## TECHNICAL SPECIFICATIONS

## SILT CONTROL STRUCTURES

### 9.1 SCOPE

This work shall consist of furnishing all materials, equipment, labor, and incidentals necessary for the installation, maintenance, and removal of silt control facilities as directed by the ENGINEER.

### 9.2 GENERAL

The exact locations, configuration, and dimensions of the various types of silt control shall be directed by the ENGINEER at the time of construction. These structures shall be installed prior to any surface disturbance on the area for which they are necessary to control silt.

The CONTRACTOR shall schedule construction activities so that the amount of exposed soil is minimized. This is to be accomplished by disturbing only those areas which are to be worked immediately and by revegetating each area as soon as practical.

### 9.3 MATERIALS

9.3.1 Silt Control Hay Bales: Silt Control Bales shall consist of either straw or hay bales. All bales are to be firmly bound by twine, and are to be installed using wooden stakes or steel bars.

9.3.2 Silt Fence: Silt Fence filter fabric shall be specifically designed for this purpose by the manufacturer and shall meet or exceed the following specifications:

| | | |
|---|---|---|
| Bursting Strength | (ASTM D751) | 150 psi |
| Grab Strength | (ASTM D1682) | 100 psi |
| Permeability | | 0.02 to 0.03 cm/sec |

Silt fence posts shall be either timber stakes (2" x 2" min) or pressed steel stakes set plumb and to sufficient depth to provide a sound anchor for the supporting wire fence and/or filter fabric.

9.3.3 Gabion Wire: The wire incorporated in the lid and body of gabion units shall be constructed of galvanized steel. The mesh shall be constructed by double twisting the adjoining wire, i.e., both wires must be twisted in an interlocking, nonraveling fashion. All wire for corners, edges, selvedges, and binding in both types of units shall be heavily galvanized with a minimum zinc coating of 0.80 ounces per square foot of uncoated wire

surface, as determined by tests conducted in accordance with ASTM A90. The tensile strength of the wire shall be at least 60,000 pounds per square inch, and the mesh must have sufficient elasticity to permit 10 percent elongation diameter of the individual wires. The following minimum wire diameters are required for non-PVC coated units only.

| Type /Use of Wire | --Minimum Diameters-- Gabion |
|---|---|
| Mesh wire | 0.118 |
| Selvedge/corner wire | 0.150 |
| Lacing/connecting wire | 0.0866 |

9.3.4 Gabion Rock Fill: The baskets shall be filled with clean, hard, durable limestone from a source approved by the ENGINEER. The stone shall be well-graded, with sizes ranging from a minimum of 5 inches to a maximum of 8 inches for gabion baskets, as measured in the greatest dimension; and shall otherwise comply with the requirements of these Technical Specifications.

9.3.5 Gabion Anchors: Steel anchors shall be standard deformed type bars conforming to ASTM A-615. The bars shall be manufactured from new billet steel of American manufacture, and shall have a minimum yield strength of 60,000 psi (Grade 60).

**9.4 FABRICATION OF GABIONS**

9.4.1 General: The gabion units shall be fabricated in such a manner that the base, sides, ends, and lids can be assembled at the construction site into a rectangular unit of the specified sizes. The body of the units shall be of single unit construction, the base, ends, sides, and lids formed of a single woven mesh unit.

All perimeter edges of the mesh forming the unit shall be securely selvedged so that the joints formed by tying the selvedges have at least the same strength as the body of the mesh.

Lacing wire shall be supplied in sufficient quantity to permit all sides, ends, and diaphragms of the body to be securely fastened, as well as to fasten the top to all sides, ends, and diaphragms of the body.

Dimensions for height, length, and width are subject to a tolerance limit of +3% of the manufacturer's stated sizes.

9.4.2 Gabions: The gabions shall be constructed with a hexagonal weave having an opening of approximately 3 1/4 inches by 4 1/2 inches. When the gabion length exceeds its width, it shall be supplied with diaphragms to form individual cells of equal length and width. The gabion unit shall be furnished with the necessary diaphragms secured in proper position on the base in such a manner that no additional tying at this juncture will be necessary. The diaphragms shall be of the same material composition as the gabion.

9.4.3 Certification: Each shipment of gabions to a job site shall be accompanied by a certification from the manufacturer, which states that the material conforms to the requirements of this Specification. The certification shall be on the manufacturer's letterhead and shall be signed by an officer of that company.

**9.5 INSTALLATION**

9.5.1 Silt Control Bales: The general locations and typical configurations of the type of silt control is subject to adjustments based on individual site conditions. Installation is labor intensive in order to assure stable and durable usage; additional hand labor may be required to provide adequate footing for the bales.

9.5.2 Silt Fences: Silt fences shall be supported with vertical wood posts which are protected by means of a metal cap or other device to prevent damage when hammers are used to drive the posts into the ground.

9.5.3 Gabions: The foundation shall be accurately prepared to accept the gabions. The foundation shall be inspected and approved by the ENGINEER prior to placement of the units.

Empty units shall be assembled individually on a hard, flat surface -- generally at the installation site. Care must be exercised to assure that each basket is stretched or manipulated as necessary to achieve the proper rectangular shape. Sides, ends, and diaphragms must be erected (and laced) to ensure the correct orientation of all seams and creases. Once assembled, empty units shall be set to the lines and grades directed by the ENGINEER.

All units shall be connected to the adjoining units, while empty, by lacing wire along the perimeters of their contact surfaces. Securing diaphragms, ends and sides, closure of units, and connecting adjoining units shall be accomplished by continuous stitching with alternating single and double loops at 4-inch intervals. All ends of lacing wire are to be securely fastened and not protruding.

Empty units are to be stretched, after being properly laced and connected to the adjoining unit(s), to obtain uniform alignment and to remove kinks. A standard fence stretcher, "come-along" or other means of tensioning the unit may be used. Adjacent rows of gabion units are to be placed such that the seams are offset.

The units shall be carefully filled with stone by hand and/or machine to maintain alignment; to avoid bulges, damage to coating, and/or separation of units; and to minimize voids. The maximum height from which stone may be dropped into gabion units shall not exceed 36 inches. In gabions over 2-foot high, the stone is to be placed in 12-inch lifts; adjusted by hand, if necessary, to form a reasonable smooth surface, and cross-ties (or bracing wires) installed. Cross-ties are to be looped through the mesh on opposing sides of the basket, and the wire tightened by twisting.

The ENGINEER may require the CONTRACTOR to use hand labor to selectively place the layers of stone along exposed surfaces (i.e., top, front, and ends) to provide a uniform surface and an overall appearance suitable to the site-specific situation at each installation. After each unit has been filled, the lid shall be leveled as necessary and secured to the sides, ends, and diaphragms using the previously described lacing (or stitching) technique.

**9.6 MAINTENANCE**

During the course of the project, silt control structures shall be maintained in sound condition and accumulations of silt which may threaten their effectiveness shall be removed. Silt removed from silt control structures shall be spread in the general vicinity of the individual structures, except when such practices may be a detriment to the environment and/or the project.

Upon completion of the project, the ENGINEER may direct the CONTRACTOR to remove, clean, or replace silt control structures and revegetate such disturbances in accordance with the seeding section of these Technical Specifications.

## 9.7 MEASUREMENT AND PAYMENT

Provision of all silt control structures shall be a part of CONTRACTOR'S Lump Sum bid for "Mobilization/DeMobilization" and shall not be measured for separate payment.

**-- THE END --**

# SECTION X

# TECHNICAL SPECIFICATIONS

# EXISTING UTILITIES

## 10.1 SCOPE

It shall be the CONTRACTOR's sole responsibility to locate existing utilities, make appropriate arrangements regarding relocation of existing utilities, either temporary or permanent, maintain the utility service throughout the construction period, and have final relocations performed at the end of the construction period. The CONTRACTOR shall notify affected utility owners, record locations of utilities on record drawings, hire specialty contractors, etc. as necessary.

All utility relocation work shall be conducted with the full knowledge and written consent of the ENGINEER and the utility owners involved. The CONTRACTOR shall comply with all applicable Federal, State and Local utility ordinances.

The CONTRACTOR shall bear sole, and full, responsibility for loss of project time arising from poor relocation coordination and from claims of damage relating to disruption of utility service. **The OWNER will not extend the Contract time for delays resulting from utility relocations.**

The utility owners affected by this project are as follows:

| | |
|---|---|
| Gas | Columbia Gas of Kentucky<br>P.O. Box 14241<br>Lexington, KY 40512-4241<br>Phone: 1-800-432-9345 |
| Water | Mountain Water District<br>P.O. Box 3157<br>Pikeville, KY 41502<br>Contact: Moss Kessee (606) 631-9167 |
| Phone | AT&T<br>29 Wills Branch<br>Prestonsburg, KY 41653<br>Contact: Jack Salyer (606) 433-7791 |

| | |
|---|---|
| Power | American Electric Power<br>4249 North Mayo Trail<br>Pikeville, KY 41501<br>Contact: Jerry Smith (606) 437-3764 |
| Television | Inter-mountain Cable<br>20 Laynesville Road<br>Harold, KY 41635<br>Phone: (606) 478-9406 |

**10.2 AGREEMENTS**

In general, when relocation of a utility is required, the relocation must be performed by the Utility Company or licensed agent of the utility company. Contractor shall secure written relocation agreements with each utility documenting the scope of the relocation activities and the responsibilities of the Utility Company and the Contractor with respect to the work and payment therefore.

**10.3 SPECIAL REQUIREMENTS**

The relocation agreements are subject to special requirements. These include:

**-- NONE --**

**10.4 MEASUREMENT AND PAYMENT**

CONTRACTOR'S protection and relocation of existing utilities as described in this section shall be considered a part of CONTRACTOR's Lump Sum bid for "Mobilization/DeMobilization" and shall not be measured for separate payment.

CONTRACTOR's reconnection of Potable Water Customers will be

**-- THE END --**

# SECTION XI

## TECHNICAL SPECIFICATIONS

## REMOVAL AND DISPOSAL OF EXISTING ON-SITE TREATMENT FACILITIES

### 11.1 SCOPE

A. Remove and dispose of existing on-site treatment facilities, piping, and appurtenances unavoidably encountered in the process of construction.

B. Fill voids created as a result of removals of existing underground treatment facilities.

### 11.2 REGULATORY REQUIREMENTS

A. Conform to applicable local code for removal of structures, safety of adjacent structures, dust control, and runoff control.

B. Obtain required permits and licenses from appropriate authorities. Pay associated fees including disposal charges.

### 11.3 PREPARATION

A. Provide, erect, and maintain erosion control devices, temporary barriers and security devices.

B. Protect existing landscaping materials, appurtenances, and structures which are not to be removed or demolished. Repair damages caused by removal operations at no cost to Owner.

C. Prevent movement or settlement of adjacent structures. Provide bracing and shoring as needed.

D. Mark location of utilities. Protect and maintain in safe and operable condition, utilities that are to remain. Prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities as acceptable to governing authorities and Owner.

**11.4 REMOVAL**

A. Prior to removal of treatment facility, all waste shall be removed by pumping and transported to the nearest wastewater treatment plant.

B. After removal of all waste, the treatment facility shall be removed from the ground and disposed of in accordance with all local, state and federal regulations.

C. Following removal of the treatment facility, the pit shall be backfilled in accordance with the technical specifications.

D. A licensed plumber shall then connect the house lateral to the sanitary sewer in accordance with the technical specifications.

**11.5 MEASUREMENT AND PAYMENT**

A. Measurement and Payment: Removal of treatment facilities encountered in the process of construction shall be paid as "Each" as mentioned in the Bid Schedule.

**-- THE END --**

# SECTION XV

# TECHNICAL SPECIFICATIONS

# FORCE MAIN VALVES

## 15.1 SCOPE

This work shall consist of furnishing and installing Valves on 10", 8", 6", 4", 3", 2" and 1.25" High Density Polyethylene pipe.

15.1.1 QUALITY ASSURANCE/SUBMITTALS

15.1.1.1 Submit five copies of manufacturer's certification of compliance with applicable AWWA specifications. The Certificate is to be signed by corporate officer having authority to legally bind the company.

## 15.2 MATERIALS

15.2.1 General: Valves 3" and larger shall be gate valves. Valves less than 3" shall be thermoplastic ball valves (Nordstrom or equal).

15.2.2 Gate Valves: All gate valves shall be iron body, nonrising stem, fully bronze mounted (Mueller or approved equal). VALVES SHALL BE RATED FOR WORKING WATER PRESSURES OF 150 PSI. Valves shall be of standard manufacture and of the highest quality both as to materials and workmanship.

All gate valves for "below ground" service shall be furnished with mechanical joint end connections. Gate valves for "above ground" (or pit) installations shall be furnished with flanged end connections.

All gate valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working water pressure cast on the body of the valve.

Each gate valve for "below ground" service shall be installed in a vertical position with a valve box, as shown in the Design Drawings. Gate valves set with boxes shall be provided with a two inch square operating nut and shall be opened by turning to the left (counterclockwise). Each gate valve for "above ground" (or pit) installations shall be furnished with a hand wheel operator.

15.2.3 Ball Valves: Two inch valves shall be thermoplastic ball valves manufactured from glass reinforced nylon materials (Nordstrom or equal).

15.2.4 Valve Box and Cover: The valve box and cover shall be of cast iron construction (Clow F-2450, or equal) and shall be engraved with the word "water".

15.2.5 Valve Marker: Each valve assembly shall be delineated by a valve marker as detailed in the Drawings. The marker shall consist of a 3" yellow PE pipe embedded vertically adjacent to the valve. The marker shall include a weatherproof label identifying the valve owner and provide an emergency phone number for the owner.

15.2.6 Plug: If the gate valve is to be installed at the end of a line the CONTRACTOR shall provide one full joint of ductile iron pipe with cap beyond the valve.

## 15.3 INSTALLATION

Trenching, bedding, and backfilling requirements for gate valves shall conform to the installation requirements for water lines and fittings. The base of the valve shall be anchored in concrete as shown in the Design Drawings. The valve box shall be installed vertically, centered over the stem of the operating nut. The valve box base shall be placed at least two inches above the flanged joint of the valve cover. The top of the operating nut should be no higher than the hub or upper part of the valve box base where it connects to the center section.

## 15.4 MEASUREMENT AND PAYMENT

15.4.1 Measurement: Valves for buried service in-place, tested, and accepted shall be measured each. Valves installed in vaults, pits, and pumping stations shall be considered incidental to the complete price for the vault, pit or pumping station and shall not be measured for separate payment.

15.4.2 Payment: Valves measured for payment shall be paid for at the contract price "each" as set forth in the Bid Schedule. Payment as specified shall be considered as full compensation for all labor, materials, equipment, and incidentals necessary to perform the work as required. The valve box and cover shall be considered incidental to the installation and shall not be measured for separate payment.

**-- THE END --**

# SECTION XVI

# TECHNICAL SPECIFICATIONS

# AIR RELEASE VALVE AND PIT

## 16.1 SCOPE

The CONTRACTOR shall provide all labor, tools, materials and equipment to furnish and install air and vacuum release valves and pits as shown on the Design Drawings and as directed.

## 16.2 QUALITY ASSURANCE/SUBMITTALS

Submit five copies of the following:

1. Documentation to substantiate compliance with materials section of this specification.

## 16.3 MATERIALS

A. Tapping Saddle: Tapping saddles shall be of double band type construction.

B. Pipe: All pipe shall be 2" HDPE DR-11 and maintain a working pressure of 160 psi.

C. Combination Air Valve:

- All air release valves shall be combination air/vacuum release valves designed for raw sewage and effluent. The valve shall be a model D-0252T as manufactured by A.R.I or approved equal.
- Each valve is to have: 2" N.P.T. intake; corrosion resistant conical body of reinforced nylon; corrosion resistant non-metallic operating mechanism; stainless steel spring loaded float to allow for system vibrations and turbulence; & working pressures of 3-240 PSI.

D. A 2" brass isolation valve shall be furnished for installation between the discharge pipe and air valve.

E. Valves with steel or cast iron bodies or internal parts that are corrosive are not acceptable.

F. Valve Pit: Valve pit shall be a manhole Type "B" in accordance with Section XIV of these specifications.

## 16.4 INSTALLATION

Installation shall include the complete assembly with pit and top, shut-off valves, blow-offs, air valves, isolation valve, piping, fittings, and union, all complete and ready for operation in general conformance with the Drawings. Work in and around the pit will be done in a workmanlike manner leaving the top of the box one inch above the original ground surface.

## 16.5 MEASUREMENT AND PAYMENT

A. Measurement: Air and Vacuum Release Valve and Pit assemblies shall be measured each.

B. Payment: Air and Vacuum Release Valve and Pit assemblies, in-place and accepted, shall be paid for at the contract unit price each as established in the Bid Schedule. Payment as specified shall be considered full compensation for all labor, materials, equipment, and incidentals necessary to perform the work as required.

**-- THE END --**

# SECTION XVII

# TECHNICAL SPECIFICATIONS

# PAVEMENT REPLACEMENT

## 17.1 PURPOSE

The purpose of this section is to outline requirements for the proper replacement of roadway and parking lot surfaces damaged through installation of utilities and the construction of new surfaces to serve the completed facilities.

## 17.2 QUALITY ASSURANCE/SUBMITTALS

A) All standards, material, methods of installation, equipment and construction shall be in accordance with the current edition of the Kentucky Department of Highways (KYDOH) publication "Standard Specifications for Road and Bridge Construction," except as modified herein.

B) Submit five copies of the following:

1) Documentation to substantiate compliance with the materials section of this specification.

## 17.2 GENERAL

Existing paving in roadways, entrances, parking lots, etc. shall be restored to a condition equal to that which existed before the work began and to the satisfaction of the OWNER. In restoring improved surfaces new pavement is required. No permanent surface shall be placed within thirty (30) days after backfilling shall have been completed, except by order of the ENGINEER!

It is a project requirement that the CONTRACTOR furnish a temporary pavement equal in character to the existing pavement damaged by the construction within thirty (30) days of the completion of the trench backfilling. The CONTRACTOR shall maintain this temporary pavement until such time as the CONTRACTOR effects the permanent pavement replacement as set forth herein. CONTRACTOR'S INSTALLATION AND MAINTENANCE OF TEMPORARY PAVEMENT REPLACEMENT SHALL BE AT CONTRACTOR'S SOLE EXPENSE. This project requirement is established to encourage CONTRACTOR to complete permanent pavement replacements at the earliest possible date following backfilling.

## 17.3 PAVEMENT REPLACEMENT CLASSES

Pavement replacement includes the following types or classes:

1) Bituminous Pavement Replacement without Concrete Sub-Slab.

2) Concrete Pavement Replacement.

3) Gravel Surface Replacement.

## 17.4 MATERIALS

17.4.1 Bituminous Concrete Surface: Bituminous concrete conforming to Sections 401 and 402 of the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction shall be used for replacement of all existing bituminous surfaces. All bituminous material aggregates, mineral fillers, tack and seal coats shall meet the appropriate materials specifications of the aforementioned Department of Highways publication. Before placing any bituminous surface, the CONTRACTOR shall submit the design plant mix for the ENGINEER'S approval. This submittal shall address both the last date the mix was approved by the Department of Highways and the location where the mix was most recently used.

17.4.2 Concrete Surface: Concrete for pavement replacement shall be a mixture of Portland Cement, fine aggregate, coarse aggregate, with or without air entrainment, as required, combined in the proportions, mixed, and placed as specified for Class "A" concrete in Sections 501 and 601 of the publication Standard Specifications for Road and Bridge Construction, (1983 Edition, Kentucky Transportation Cabinet, Department of Highways).

17.4.3 Dense Graded Aggregate: Dense graded aggregate used for a base shall be a durable, crushed limestone meeting the requirements of Section 805 of the publication Standard Specifications for Road and Bridge Construction, (1983 Edition, Kentucky Transportation Cabinet, Department of Highways).

## 17.5 INSTALLATION OF BITUMINOUS SURFACES

17.5.1 General: The class of bituminous surface that will be used is Bituminous Pavement Replacement for Pavements without Concrete Sub-Slab. The definition of this class is as follows:

a) "Bituminous Pavement Replacement without Concrete Sub-Slab" does not require a concrete sub-slab. The pavement thickness shall be no less than the existing pavement thickness. The pavement width shall not exceed the maximum widths as specified in the Detail Drawings.

17.5.2 Base Preparation: The pipe trench shall be backfilled as indicated on the Detail Drawings. This backfill shall be cut back, shaped, graded, and compacted. A base course of 6" of dense graded aggregate shall then be placed and compacted.

For Full Width Pavement Replacement/Construction the base course shall be prepared as follows:

a. Compact 6" of DGA in pipe trench per the Detail Drawings.

b. Clean the existing pavement of construction debris (mud, gravel, etc.) This requires brooming!

c. Potholes, ruts, and other severely deteriorated portions of existing pavement shall be patched with bituminous base.

d. The cleaned and patched surface shall be jointly inspected by the CONTRACTOR and the ENGINEER. The surface must be accepted in writing by the ENGINEER before tacking operations begin.

e. The cleaned and patched surface shall be shot with 0.4 lb/sy of RS-2 tack.

17.5.3 Surface Course: The prepared pipe trench shall be paved with bituminous concrete Class I per the Detail Drawings. For full width construction, the full surface width shall receive a 2" base course and 1" surface course of bituminous concrete Class I per the Detail Drawings.

## 17.6 INSTALLATION OF CONCRETE SURFACES

17.6.1 Base Course: The pipe trench shall be backfilled as indicated on the Design Drawings. This backfill shall be cut-back, shaped, graded and compacted. A base course of 6" of dense graded aggregate shall then be placed and compacted.

17.6.2 Surface Course: The existing concrete pavement shall be cut-back with a concrete saw the distance as specified on the Design Drawings so that the final surface can be placed in a strip of uniform width. The subgrade shall be shaped, graded and compacted as directed by the ENGINEER. Class "A" concrete as described herein shall be placed to the greater of the existing pavement thickness or 6". The concrete slab shall be reinforced with 6" x 6" No. 4 wire mesh.

## 17.7 INSTALLATION OF GRAVEL SURFACES

17.7.1 Gravel Pavement Replacement: The pipe trench shall be backfilled as indicated on the Design Drawings. The trench backfill shall be cut-back, shaped, graded and compacted. A 6" course of dense graded aggregate shall then be placed and compacted.

## 17.8 MEASUREMENT AND PAYMENT

17.8.1 Measurement: There shall be no measurement for payment as the work shall be Lump Sum.

17.8.2 Payment: Payment shall be made at the Lump Sum contract Price as set forth in the Bid Schedule for the applicable contract. Payment as specified shall constitute full compensation for all labor, materials, equipment and incidentals necessary to complete the work.

**-- THE END --**

# SECTION XVIII

# TECHNICAL SPECIFICATIONS

# BORE AND/OR ENCASE

## 18.1 SCOPE

This work shall consist of furnishing and installing steel encasement pipes for sanitary sewer lines and force mains by boring, jacking, or open cut methods.

18.1.1 Quality Assurance/Submittals

18.1.1.1 Submit five copies of certified mill test report on steel encasement pipe.

## 18.2 GENERAL

The CONTRACTOR shall comply with the previously obtained permits and approvals for completion of this work. Copies of the permits and/or approvals are reproduced in the Permits section of this document.

## 18.3 MATERIALS

18.3.1 Encasement Pipe: Encasement pipe shall be steel, plain end, uncoated, unwrapped, have continuously welded joints and have a yield point strength of 35,000 psi and conform to AWWA Specifications C200. The minimum wall thickness of the pipe shall be as indicated in the Detail Drawings.

In general, the inside diameter of the encasement pipe shall be 4 inches greater than the largest outside diameter of the carrier pipe. The Detail Drawings provide a table from which required encasement pipe diameters may be derived.

Field welding of encasement pipe shall be performed by a certified welder in accordance with the requirements of AWWA Specification C206-82.

18.3.2 Seals: A removable watertight rubber seal shall be used to seal the annulus between the excavation and the encasement pipe.

## 18.4 INSTALLATION - BORE AND JACK

**No distinction shall be made between boring through earth or boring through rock. The CONTRACTOR shall conduct his own investigation of subsurface conditions and shall base his bid on his own findings.**

The jacking will be allowed in one direction only. The installation procedure must provide for the placement of the encasement pipe concurrently with the removal of the soil.

Grouting between the excavation and the encasement pipe will be required if ordered by the ENGINEER or if, for any reason, the excavation exceeds one (1) inch larger than the outside diameter of the liner. Grout holes shall be provided in the tunnel lining with a spacing not to exceed four and one-half (4.5) feet measured longitudinally. The location of the holes shall be varied around the periphery of the encasement pipe to suit field conditions which will permit the proper grouting sequence to insure complete filling of void spaces outside the encasement pipe. The CONTRACTOR shall fill all the void space outside the encasement pipe with Portland Cement grout. The machine used for grouting shall permit the application of a pressure up to seventy-five (75) pounds per square inch in excess of any external water pressure. A gage shall be provided which will accurately indicate working pressure and this gage shall be carefully watched during grouting operations. The pressure shall at no time be allowed to exceed that considered safe or which would distort the encasement pipe. Grout pipes shall be one and one-half (1½) inches inside diameter.

The carrier pipe shall be installed after the encasement pipe is in place. The installation of the carrier pipe shall be in accordance with the manufacturer's specifications using casing skids as shown in the Detail Sheets of the Design Drawings. After the carrier pipe has been installed, inspected, and tested as specified, both ends of the encasement pipe shall be closed with a removable, water-tight "boot" in a manner acceptable to the OWNER.

## 18.5 INSTALLATION - OPEN CUT

Where the encasement pipe is placed in open cut, the encasement pipe trenching, bedding, laying, and backfilling shall conform to the requirements of the applicable sections of these Specifications. The carrier pipe shall be installed after the encasement pipe is in place. The installation of the carrier pipe shall be in accordance with the manufacturer's specification using casing skids as shown in the Detail Sheets of the Design Drawings. After the carrier pipe has been installed, inspected, and tested as specified, both ends of the cover pipe shall be closed with a removable, watertight "boot" in a manner acceptable to the OWNER.

## 18.6 MEASUREMENT AND PAYMENT

18.6.1 Measurement: "Bore and Encase for 'X' inch Pipe" of the applicable diameter will be measured by the linear foot of steel encasement pipe furnished, installed, inspected and accepted. "Open Cut Encase for 'X' inch Pipe" of the applicable diameter will be measured by the linear foot of steel encasement pipe furnished, installed, inspected and accepted.

18.6.2 Payment: Payment for "Bore and Encase for 'X' inch Pipe" of the applicable diameter will be made at the contract unit price per linear foot as set forth in the Bid Schedule for the number of feet of encasement pipe measured. Payment for "Open Cut Encase for 'X' inch Pipe" of the applicable diameter will be made at the contract unit price per linear foot as set forth in the Bid Schedule for the number of feet of encasement pipe measured. Such payment shall constitute full compensation for all materials, labor, equipment and incidentals necessary for the completion of the work. Carrier pipe installed in the encasement pipe will be measured and paid for as indicated in the applicable sections of these Specifications.

**-- THE END --**

# SECTION XXVII

# TECHNICAL SPECIFICATIONS

# CONNECTIONS TO EXISTING WATER LINES

## 27.1 SCOPE

This work shall consist of furnishing and installing all necessary materials to connect new water mains to existing water lines.

## 27.2 SUBMITTALS

27.2.1 Submit five copies of documentation substantiating manufacturer's compliance with these specifications.

## 27.3 MATERIALS

27.3.1 Tapping Sleeves: The tapping sleeve shall be of full circle clamp type construction of the appropriate diameter and approved by the manufacturer for use with the existing pipe encountered. The tapping branch of the sleeve shall be mechanical joint. The CONTRACTOR shall verify that the rated pressure class of the tapping sleeve exceeds the working pressure of the water line. Valves used in tapping operations shall be as specified in the valve section of these specifications except that the seat rings shall be of large diameter to permit entry of the tapping machine cutters.

27.3.2 Bends and Fittings: Bends and fittings shall be ductile iron, mechanical joint conforming to the requirements of Section IX of these specifications.

## 27.4 INSTALLATION

Installation shall be made as directed in the Design Drawings or as indicated in the manufacturer's literature. The CONTRACTOR shall make every possible effort to minimize any interruption in water service for existing customers. The CONTRACTOR must satisfy the following conditions prior to proceeding with the connection:

a. The ENGINEER shall have accepted the new pipe line as in-place, suitably pressure tested, suitably disinfected, and ready for service.

b. All water outages must be approved by the OWNER. The CONTRACTOR shall have provided both the OWNER and the ENGINEER at least 72 hours advance written notice of the scheduled date for the water outage and connection. This notice should advise the OWNER to schedule personnel to terminate service in the affected pipe reach and to notify customers of the pending outage.

c. The CONTRACTOR shall have all necessary bends, fittings, glands, adapters, etc. on-site on the date notice of the impending connections is forwarded to the ENGINEER.

d. Connections to existing water lines may only be made on Monday, Tuesday, and Wednesday. No connections to existing water lines may be made on Thursday, Friday, Saturday, or Sunday.

All pipe bendings and fittings shall be restrained using a steel tiebolt joint restraint system (Star SuperStar system, or equal). The number of restraints employed per mechanical joint shall be based on the manufacturer's load tables for the ambient system pressure. Installation shall be made as directed in the Design Drawings or as indicated in manufacturer's literature.

## 27.5 MEASUREMENT AND PAYMENT

27.5.1 Measurement: Connections to existing water lines shall be measured each.

27.5.2 Payment: "Connect to Existing X Inch Water Line" shall be paid for at the contract price "each" as set forth in the Bid Schedule. This payment shall constitute full compensation for all materials, labor, equipment and incidentals necessary for the completion of the work. Payment for the tapping valve will be made under the valve section of these specifications. There will be no separate payment for "hunt and search excavation", for restraint system, public notices, bends, fittings or other incidentals.

**- THE END -**

# SECTION XXVIII

# TECHNICAL SPECIFICATIONS

# WATER LINES AND FITTINGS

## 28.1 SCOPE

This work shall consist of furnishing, installing, testing, and disinfecting potable water line pipes of various diameters.

28.1.1. Quality Assurance/Submittals

28.1.1.1 Submit five copies of documentation to substantiate pipe material's compliance with these specifications.

28.1.1.2 Submit five copies of CONTRACTOR'S Bedding and Backfilling Plan. At a minimum the plan shall:

a. Identify/acknowledge the segments of pipe line to be backfilled using "open", "gravel", and "paved" criteria,

b. Include a representative Proctor Curve for the backfill material for all significant sections of pipe line to be backfilled using "paved" criteria (curve to be prepared and sealed by a geotechnical engineer registered in the State of Kentucky - curve not required if CONTRACTOR backfills entire trench with fine crushed stone),

c. Include quarry's material certification for all aggregates utilized for bedding, haunching, and initial protective backfill, and

d. Include name and qualifications of CONTRACTOR'S nuclear density technician (technician must be a full time employee of CONTRACTOR, spot checks by a sub-contracting testing firm are not acceptable).

28.1.1.3 Submit five copies of each pressure test performed within 48 hours of test completion. Documentation to include quantity of water used and pressure charts from recording pressure gage.

28.1.1.4 Submit five copies of documentation for each disinfection of each pipe reach within 7 days of collection of samples. Documentation to include form of chlorine applied, method of application, quantity of make-up water used, quantity of residual chlorine concentration one hour after dosing, residual chlorine concentration 24 hours after dosing, point of disposal of waters of chlorination, method of de-chlorination, quantity of flushing water supplied, and results of bacteriological examination of water samples.

## 28.2 MATERIALS

28.2.1 General: All pipe used for potable water service shall be as indicated in the plans.

28.2.2 Ductile Iron Pipe, Fittings and Joints: Ductile iron pipe shall conform to the latest AWWA Specifications C151 (ANSI A21-51) with standard thickness as designated in AWWA C150. Thickness class shall be 350 unless noted otherwise on the plans by the ENGINEER.

The interior of the pipe shall be cement-mortar lined with bituminous seal coat in accordance with AWWA C104 (ANSI A21.4). Thickness of the lining shall be as set forth in Sec. 4-10-1 of the aforementioned specifications unless otherwise directed by the OWNER. The exterior of all pipe, unless otherwise specified, shall receive either a coal tar or asphalt base coating a minimum of one mil thick.

Where ductile iron pipe is to be installed in corrosive soil conditions, the pipe shall be protected by an eight mil thick polyethylene encasement meeting the requirements of ANSI A21.5. Such corrosive soils include but are not limited to salt marshes, saturated alkaline soils, cinder fills, areas of decaying vegetation, and waste dumps.

Bends and fittings shall be Mechanical Joint Compact Ductile Iron fittings, conforming to AWWA Specifications C153 for short body iron fittings. Fittings shall be tar-coated outside and shall receive the standard cement lining with bituminous seal coat on the inside as specified for the ductile iron pipe.

Joints shall be of the push-on (AWWA C111), mechanical joint (AWWA C111), restrained mechanical joint, or ball and socket type as called for in the Plans. Bells for push-on type

joints shall have an annular recess in the pipe socket to accommodate a single rubber gasket. Plain ends shall be suitably beveled to permit easy entry into the bell. The gasket is locked in place against displacement as the joint is assembled.

Mechanical joints shall be bolted and of the stuffing box type and shall consist of a bell with exterior flange and interior recess for the sealing gasket, a pipe or fitting plain end, a sealing gasket, a follower gland, tee-head bolts and hexagon nuts. A restrained mechanical joint is a mechanical joint with a ductile iron retainer gland equal to a Clow F-1058 retainer gland or the Megalug Series 1100 joint restraint.

Joints for all bends and fittings for buried service shall be restrained mechanical joint type only (AWWA C111). Flanged joint pipe shall be used in vaults, pits and above ground service installation. Flanged joint pipe may not be used for buried service.

**4-Inch Ductile Iron Pipe as manufactured by McWane Cast Iron Pipe Company WILL NOT be accepted on these contracts.**

28.2.3 Polyvinyl Chloride Pipe, Fittings and Joints: PVC water pipe shall conform, at a minimum, to ASTM Specifications D-2241, and shall be pressure class 250. The pipe furnished under ASTM A-2241 shall have a standard dimension ratio not to exceed SDR 17, and shall be rated to a working pressure of at least 250 psi at 73.4°F.

Fittings shall be cast iron Mechanical Joint Class 250 conforming to AWWA Specifications C110 for short body cast iron fittings. Fittings shall be tar-coated outside, and shall receive the standard cement lining with bituminous seal coal on the inside as specified for the ductile iron pipe.

Joints shall be of the push-on type conforming to ASTM D3139 and F477 requirements for elastometric-gasket joints. All jointing material and lubricants shall be non-toxic.

28.2.4 Pipe Bedding: Pipe bedding stone shall be durable crushed limestone meeting the requirements of Section 805 of the Current Edition of the Kentucky Department of Highways publication "Standard Specifications for Road and Bridge Construction."

28.2.5 Geotextile Type III: Geotextiles shall be woven or non-woven geotextile fabrics meeting the material and strength requirements for Type III fabrics as set forth in Section 215 of the Current Edition of the Kentucky Department of Highways publication "Standard Specifications for Road and Bridge Construction."

## 28.3 INSTALLATION

28.3.1 Trench Excavation: Unless specifically directed otherwise by the ENGINEER, not more than 500 feet of trench shall be opened ahead of the pipe laying work of any crew and not more than 500 feet of open ditch shall be left behind the pipe laying work of any one crew.

All backfilled ditches shall be maintained in such a manner that they will offer no hazard to the passage of traffic. The convenience of the traveling public and property owners abutting shall be taken into consideration. All public or private drives shall be taken into consideration and shall be promptly backfilled or bridged. Excavated materials shall be disposed of so as to cause the least interference.

Trenches in which pipes are to be laid shall be excavated in open cut to the depths shown on the approved plans. The minimum allowable trench width shall not be less than the outside diameter of the pipe plus eight inches. Where rock is encountered, it shall be removed to a minimum depth of six inches below the pipe bells.

Unless specifically authorized by the ENGINEER, trenches shall in no case be excavated or permitted to become wider than two feet six inches plus the nominal diameter of the pipe at the level of or below the top of the pipe. If the trench does become wider than two feet six inches at the level of or below the top of the pipe, special precautions may be necessary, such as providing compacted granular fill up to the top of the pipe or providing pipe with additional crushing strength as determined by the ENGINEER. This determination shall take into account the actual trench loads that may result and the strength of the pipe being used.

All excavated materials shall be placed a minimum of two feet back from the edge of the trench.

Where conditions exist that may be conducive to slides or cave-ins, proper and adequate sheeting, shoring and bracing shall be installed (See Section 28.3.1.2) to provide safe working conditions and to prevent damage of work.

Trenches shall be kept free of water during the laying of pipe and until the pipeline has been backfilled.

28.3.1.1 Obstructions: In cases where storm sewers, gas lines, water lines, telephone lines, and other utilities, or other underground structures are encountered, they shall not be displaced or molested unless necessary, in which case they shall be replaced in as good condition as found as quickly as possible.

The CONTRACTOR shall notify the utility companies 48 hours prior to excavation adjacent to their facilities.

28.3.1.2 Shoring, Sheeting and Bracing: Where unstable material is encountered or where the depth of excavation in earth exceeds six feet, the sides of the trench or excavation shall be supported by substantial sheeting, bracing and shoring, or the sides sloped to the angle of repose. Sloping the sides of the ditch to the angle of repose will not be permitted in streets, roads, narrow rights-of-way or other constructed areas unless otherwise specified. The design and installation of all sheetings, sheet piling, bracing and shoring shall be based on computations of pressure exerted by the materials to be retained under construction conditions. Adequate and proper shoring of all excavations shall be the entire responsibility of the CONTRACTOR; however, the ENGINEER may require the submission of shoring plans (accompanied by the supporting computations) for review prior to the CONTRACTOR undertaking any portion of the work.

Foundations adjacent to where the excavation is to be made below the depth of existing foundation, shall be supported by shoring, bracing or underpinning as long as the excavation shall remain open, or thereafter if required to insure the stability of the structure supported by the foundation, and the CONTRACTOR shall be held strictly responsible for any damage to said foundation.

Solid sheeting will be required for wet or unstable material. It shall consist of continuous vertical sheet piling of timber or steel with suitable walls and braces.

Care shall be taken to avoid excessive backfill loads on the completed pipelines, and the requirements that the width of the ditch at the level of the crown of the pipe be not more than two feet six inches plus the nominal diameters of the pipe shall, as set out in Section 28.3 hereinbefore, be strictly observed.

Trench sheeting shall not be removed until sufficient backfill has been placed to protect the pipe.

All sheeting, planking, timbering, bracing and bridging shall be placed, renewed and maintained as long as necessary.

28.3.1.3 Blasting: Blasting operations on this project are prohibited.

28.3.2 Pipe Bedding: In all cases the foundation for pipes shall be prepared so that the entire load of the backfill on top of the pipe will be carried on the barrel of the pipe and insofar as possible where bell and spigot pipe are involved so that none of the load will be carried on the bells.

Where undercutting and granular bedding are involved, the depth at the bottom of the bells of the pipe will be at least four inches above the bottom of the trench as excavated.

Supporting of pipe shall be as set out hereinbefore, and in no case shall the supporting of pipe on blocks be permitted. The Design Drawings present typical approved bedding methods.

28.3.2.1 Earth Foundation: All pipe shall be laid on a six inch bed of granular material to provide continuous support for the lower section of the pipe. Granular bedding shall be #9 crushed stone. Granular bedding shall be mechanically compacted prior to pipe placement.

28.3.2.2 Rock Foundation: If the trench bottom is in rock the excavation shall be undercut to a minimum depth of six inches below the bottom of the pipe. The pipe shall be laid on a bed of granular material to provide continuous support for the lower section of the pipe.

Granular bedding shall be #9 crushed stone. Granular bedding shall be mechanically compacted prior to pipe placement.

28.3.2.3 Special Bedding: In wet, yielding mucky locations where pipe is in danger of sinking below grade or floating out of line or grade, or where backfill materials are of such a fluid nature that such movements of the pipe might take place during the placing of the backfill, the ENGINEER may order "Special Pipe Bedding." When the ENGINEER orders "Special Pipe Bedding" (in writing), the CONTRACTOR shall:

a. overexcavate the mucky subgrade to the depth directed,

b. install a Type III geotextile as illustrated in the detail drawings,

c. backfill the geotextile with bedding stone, and

d. overlap the geotextile envelope in accordance with the detail drawings.

It is to be expressly understood that "Special Pipe Bedding" may only be employed upon written order of the ENGINEER.

28.3.3 Laying Pipe: All pipe shall be laid with ends abutting and true to line and grade as shown on the plans. Supporting of pipe shall be as specified under "Pipe Bedding" hereinbefore and in no case will the supporting of pipes on blocks be permitted.

Fittings for the water mains shall be provided and placed as and where directed by the ENGINEER or shown on the plans. All open ends of pipes and of branches shall be sealed or plugged.

Before each piece of pipe is lowered into the trench, it shall be thoroughly inspected to insure its being clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. Any defective pipe or fitting discovered after the pipe is laid shall be removed and replaced with a satisfactory pipe or fitting. In case a length of pipe is cut to fit in a line, it shall be so cut as

to leave a smooth end at right angles to the longitudinal axis of the pipe.

Granular bedding material as specified hereinbefore, shall be used to correct irregularities in the earth trench subgrade.

The interior of the pipe, as the work progresses, shall be clean. When laying of any pipe is stopped for any reason, the exposed end of such pipe shall be closed with a watertight plug fitted into the pipe bell, so as to exclude earth or other material.

No backfilling (except for securing pipe in place) over pipe will be allowed until the ENGINEER, or his representative has made an inspection of the joints, alignment and grade in the section laid, but such inspection shall not relieve the CONTRACTOR of further liability in case of defective joints, misalignment caused by backfilling and other such deficiencies that are noted later.

28.3.4 Jointing Pipe: The pipe joints described shall be installed in accordance with the manufacturer's recommendations.

28.3.5 Backfilling Pipeline Trenches: All backfilling shall be accomplished in accordance with the details of this section and the project plans. Any variances must be approved in writing by the ENGINEER.

Before final acceptance, the CONTRACTOR will be required to level off all trenches or to bring the trench up to the level of the surrounding terrain. The CONTRACTOR shall also remove from roadways, rights-of-way and/or private property all excess earth or other materials resulting from construction.

When the pipe trench crosses a street or roadway, the CONTRACTOR shall be responsible for maintaining the trench surface in a level condition at proper pavement grade at all times.

In all cases walking or working on the completed pipelines except as may be necessary in tamping or backfilling will not be permitted until the trench has been backfilled to a point one foot above the top of the pipe. The filling of the trench and the tamping of the backfill shall be carried on simultaneously on both sides of the pipe in such a manner that the completed pipeline will not be disturbed and injurious side pressures do not occur.

In all cases the pipe bedding and haunching shall be #9 crushed stone. The pipe bedding shall be mechanically tamped prior to placement of the pipe. The pipe bedding shall be thoroughly compacted taking care not to damage the pipe.

28.3.5.1 Method "A" Backfilling in Open Terrain: Backfilling of pipeline trenches in open terrain shall be accomplished in the following manner:

In all cases the lower portion of the trench, from the pipe bedding to the springline (centerline) of the pipe shall be backfilled with #9 crushed stone. This stone shall be carefully and thoroughly compacted.

The portion of the trench from the springline of the pipe to a point 6 inches above the pipe shall be backfilled in six inch lifts with #9 crushed stone. Each lift shall be hand tamped taking care not to damage the pipe.

The portion of the trench from a point 6 inches above the top of the pipe to the ground surface shall be backfilled in six (6) inch lifts with material which is free from ¾" or larger rock. Incorporation of rock having a volume exceeding one-half cubic foot is prohibited. The backfill shall be mechanically tamped in six inch lifts to 95 percent of standard Proctor Density (ASTM D-698).

28.3.5.2 Method "B" Backfilling Under Graveled Areas: Backfilling of pipeline trenches under existing and proposed graveled parking lots, driveways, etc. shall be accomplished in the following manner:

The pipe bedding and haunching shall be placed and compacted as described in Paragraph 28.3.5.1. The lower portion of the trench from the pipe springline to a

point 6 inches above the pipe, shall be backfilled and lightly tamped with #9 crushed stone as described in Paragraph 28.3.5.1. The portion of the trench from a point 6 inches above the pipe to a point 6 inches below the ground surface shall then be backfilled with available material in six (6) inch lifts. Each lift shall be compacted to 100 percent of Standard Proctor Density (ASTM D-698) at a moisture content within two percent of optimum. The final 6 inches of the trench backfill shall be thoroughly compacted dense graded aggregate.

28.3.5.3 Method "C" Backfilling Under Paved Areas: Backfilling of pipeline trenches under existing and proposed sidewalks, streets, proposed streets, and driveways shall be accomplished in the following manner:

The pipe bedding and haunching shall be placed and compacted as described in Paragraph 28.3.5.1. The lower portion of the trench from the pipe springline to a point 6 inches above the pipe, shall be backfilled and lightly tamped with #9 crushed stone as described in Paragraph 28.3.5.1. The portion of the trench from a point 6 inches above the pipe to a point 6 inches below the ground surface shall then be backfilled with #9 crushed stone in six inch (6) lifts. Each lift shall be compacted to 100 percent of Standard Proctor Density (ASTM D-698) at a moisture content within two percent of optimum.

The upper portion of the trench from a point six inches below the bottom of the existing or proposed pavement or concrete sub-slab may be backfilled with a base course of dense graded aggregate which shall be maintained flush with the pavement surface for at least 30 days prior to placement of the final surface. The excess dense graded aggregate shall be removed concurrently with the placement of the final pavement surface.

28.3.5.4 Settlement of Trenches: Wherever pipe lines are in, or across, driveways and streets, the CONTRACTOR shall be responsible for any trench settlement which occurs within these rights-of-way within one year from the time of final acceptance of the work. If paving shall require replacement because of trench settlement

within this time, it shall be replaced by the CONTRACTOR. Repair of settlement damage shall meet the approval of the appropriate governing body.

28.3.5.5 Pavement Replacement: Pavement replacement shall be performed in accordance with the applicable section of these Technical Specifications.

## 28.4 TESTING OF LINES

On all projects involving the installation of water pipeline, the finished work shall comply with the provisions listed below, or similar requirements which will ensure equal or better results:

a) All water mains shall be given a hydrostatic test. Test pressure shall be a minimum of 150 psi, 50 psi above the standard operating pressure (to be supplied by the ENGINEER), or 67% of the pipe rating, whichever is greater. Test pressure shall not vary by more than ±10 psi for the duration of the test. Leakage shall not be greater than that determined by the following formula: 1 gallon per inch of pipe diameter per mile per 24 hours.

b) All test waters shall be potable water obtained from the Mountain Water District distribution system. Withdrawals of water from the District system must be both authorized and metered. The District will bill the CONTRACTOR for all waters used in accordance with its current leak adjustment rate.

c) Where practicable, pipelines shall be tested between line valves or plugs in lengths of not more one mile. The OWNER may allow testing in longer sections on a case by case basis.

d) Duration of test shall be no less than twenty-four hours.

e) Where leaks are evident on the surface where joints are covered, the joints shall be recaulked, repoured, bolts retightened or relaid, and leakage minimized regardless of total leakage as shown by test.

f) All pipe fittings and other materials found to be defective under test shall be removed, repaired or replaced at the discretion of the OWNER.

g) Lines which fail to meet test requirements shall be repaired and retested as necessary until test requirements are complied with.

h) The CONTRACTOR shall furnish a recording pressure gauge for the pressure and leakage test. The gauge shall be a Bristol Babcock Model No. 5311110A-143-002-310-610-000. Charts shall become the property of the OWNER at conclusion of test.

## 28.5 DISINFECTION OF WATER LINES

The new potable water lines shall not be placed in service, either temporarily or permanently, until they have been thoroughly disinfected by the Continuous Feed Method as set forth in the latest edition of AWWA Specification C-651. Specification C-651 is reproduced in the Reference Section of this Contract Document in its entirety.

The following requirements apply to the disinfection activity:

a) All flushing and test waters shall be potable water obtained from the Mountain Water District system. Withdrawals of water from the District system must be both authorized and metered. Mountain Water District will bill the CONTRACTOR for all waters used in accordance with its current leak adjustment rate.

b) The Tablet and Slug Method of disinfection may not be used.

c) The water lines shall be flushed prior to disinfection. Flush waters may be discharged to the nearest storm drain or surface water way in a controlled manner which will not result in environmental damage.

d) The CONTRACTOR shall have a chlorine test kit in his possession for purposes of monitoring the disinfection dose.

e) The free chlorine residual immediately after chlorine dosing shall be 50 mg/l. The free chlorine residual 24 hours after chlorine dosing shall not be less than 25 mg/l.

f) The heavily chlorinated waters of disinfection shall be neutralized with an approved neutralizing agent prior to discharge.

g) After disinfection and flushing, and before the water main is placed in service, bacteriological samples shall be collected and analyzed in accordance with the requirements of the Kentucky Department for Natural Resources and Environmental Protection. The new line may not be connected to the system until the samples have been approved.

## 28.6 MEASUREMENT AND PAYMENT

28.6.1 Measurement: Water pipe in place, complete, successfully tested and disinfected shall be measured in linear feet along the pipe centerline. Pipe fittings (tees, reducers, etc.) will be measured "each". The length of fittings measured for payment shall be deducted from the lineal feet of pipe laid to avoid "double" payment. Pipe bends will not be measured for separate payment. Bends shall be measured in linear feet. No allowance shall be made for laps or drops at connections.

"Special Pipe Bedding" - ordered in writing by the ENGINEER - in place and accepted shall be measured by the ton of bedding stone actually placed (to the top of the geotextile envelope). There will be no separate measurement of Geotextile Type III or other incidentals.

28.6.2 Payment: Payment for pipe will be made at the contract unit price per linear foot for each pipe class as set forth in the Bid Schedule. Payment for fittings will be made at the contract price "each" as set forth in the Bid Schedule. Such payment for pipe and fittings shall constitute full compensation for all materials, labor, equipment, and incidentals necessary for the completion of the work. Retainer glands for restrained mechanical joint pipe shall be considered incidental to the unit price for mechanical joint pipe.

Payment for "Special Pipe Bedding" - ordered in writing by the ENGINEER - shall be made at the contract unit price per ton for the actual quantity measured. There shall be no separate payment for Geotextile Type III or other incidentals.

**-- THE END --**

# SECTION XXIX

# TECHNICAL SPECIFICATIONS

# GATE VALVES

## 29.1 SCOPE

This work shall consist of furnishing and installing gate valves of various diameters for potable water lines.

29.1.A QUALITY ASSURANCE/SUBMITTALS

29.1.A.1 Submit five copies of manufacturer's certification of compliance with applicable AWWA specifications. Certificate to be signed by corporate officer having authority to legally bind the company.

## 29.2 MATERIALS

29.2.1 Gate Valves: All gate valves shall be iron body, nonrising stem, fully bronze mounted (Mueller or approved equal). VALVES INSTALLED IN PVC WATER LINES SHALL BE RATED FOR WORKING WATER PRESSURES OF 250 PSI. VALVES INSTALLED IN DUCTILE IRON WATER LINES SHALL BE RATED FOR WORKING WATER PRESSURES OF 250 PSI. Valves shall be of standard manufacture and of the highest quality both as to materials and workmanship.

Gate valves larger than 12" shall be of resilient, parallel seat construction conforming to AWWA C500-80. Gate valves 12" and smaller shall be of resilient seat construction conforming to AWWA C509-80.

All gate valves for "below ground" service shall be furnished with mechanical joint end connections. Gate valves for "above ground" (or pit) installations shall be furnished with flanged end connections.

All gate valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working water pressure cast on the body of the valve.

Each gate valve for "below ground" service shall be installed in a vertical position with a valve box, as shown in the Design Drawings. Gate valves set with boxes shall be provided with a two inch square operating nut and shall be

opened by turning to the left (counterclockwise). Each gate valve for "above ground" (or pit) installations shall be furnished with a hand wheel operator.

29.2.2 Valve Box and Cover: The valve box and cover shall be of cast iron construction (Clow F-2450, or equal) and shall be engraved with the word "water".

29.2.3 Valve Marker: Each valve assembly shall be delineated by a valve marker as detailed in the Drawings. The marker shall consist of a 3" yellow PE pipe embedded vertically adjacent to the valve. The marker shall include a weatherproof label identifying the valve owner and provide an emergency phone number for the owner.

29.2.4 Plug: If the gate valve is to be installed at the end of a line the CONTRACTOR shall provide one full joint of ductile iron pipe with cap beyond the valve.

## 29.3 INSTALLATION

Trenching, bedding, and backfilling requirements for gate valves shall conform to the installation requirements for water lines and fittings. The base of the valve shall be anchored in concrete as shown in the Design Drawings. The valve box shall be installed vertically, centered over the stem of the operating nut. The valve box base shall be placed at least two inches above the flanged joint of the valve cover. The top of the operating nut should be no higher than the hub or upper part of the valve box base where it connects to the center section.

## 29.4 MEASUREMENT AND PAYMENT

29.4.1 Measurement: Gate valves for buried service in-place, tested, and accepted shall be measured each. Valves installed in vaults, pits, and pumping stations shall be considered incidental to the complete price for the vault, pit or pumping station and shall not be measured for separate payment.

29.4.2 Payment: Gate valves measured for payment shall be paid for at the contract price "each" as set forth in the Bid Schedule. Payment as specified shall be considered as full compensation for all labor, materials, equipment, and incidentals necessary to perform the work as required. The valve box and cover shall be considered incidental to the installation and shall not be measured for separate payment.

**-- THE END --**

# SECTION XXX

# TECHNICAL SPECIFICATIONS

# AIR RELIEF

## 30.1 SCOPE

The CONTRACTOR shall provide all labor, tools, materials and equipment necessary to furnish and install air release valves and boxes as shown on the Plans and as directed.

## 30.2 QUALITY ASSURANCE/SUBMITTALS

30.2.1 Submit five copies of itemized summary of source of manufacture of each item in air relief assembly. Provide manufacturer's certification of compliance with specifications for each item.

## 30.3 MATERIALS

30.3.1 Tapping Saddle, Corporation Stop: The tapping saddle and corporation stop shall meet the material requirements of the water service connection section of these specifications.

30.3.2 Pipe: All pipe shall be rated for a working water pressure of 300 psi. Pipe diameter shall conform to the detail drawings.

30.3.3 Air Release Valve: The air release valve shall be a simple lever type with cast iron body and stainless steel trim rated for a working pressure of 300 psi. A Valvmatic Model #22 or approved equal shall be employed. Valve inlet shall conform to the detail drawings.

30.3.4 Valve Box and Lid: The valve box and lid shall consist of a polyethylene box and cast iron lid meeting the material requirements of the water service connection section herein.

## 30.4 INSTALLATION

Installation shall include the complete assembly with box and top, shut-off valve, blow-off, air valve, and piping, fittings and union, all complete and ready for operation in general conformance with the Drawings. Work in and around the box will be done in a workmanlike manner leaving the top of the box one inch above the original ground surface.

## 30.5 MEASUREMENT AND PAYMENT

30.5.1 Measurement: "Air Relief" assemblies in-place, tested and accepted shall be measured "each."

30.5.2 Payment: Payment for "Air Relief" shall be made at the contract unit price "each" as set forth in the Bid Schedule for the actual number of assemblies measured. Payment as specified shall be considered full compensation for all labor, materials, equipment and incidentals necessary to perform the work as required.

**- THE END -**

# SECTION XXXI

# TECHNICAL SPECIFICATIONS

# BORE AND/OR ENCASE WATER LINE

## 31.1 SCOPE

This work shall consist of furnishing and installing steel encasement pipes for potable water lines by boring, jacking, or open cut methods.

31.1.A Quality Assurance/Submittals

31.1.A.1 Submit five copies of certified mill test report on steel encasement pipe.

## 31.2 GENERAL

The CONTRACTOR shall comply with the previously obtained permits and approvals for completion of this work. Copies of the permits and/or approvals are reproduced in the Permits section of this document.

## 31.3 MATERIALS

31.3.1 Encasement Pipe: Encasement pipe shall be steel, plain end, uncoated, unwrapped, have continuously welded joints and have a yield point strength of 35,000 psi and conform to AWWA Specifications C200. The minimum wall thickness of the pipe shall be as indicated in the Detail Drawings.

In general, the inside diameter of the encasement pipe shall be 4 inches greater than the largest outside diameter of the carrier pipe. The Detail Drawings provide a table from which required encasement pipe diameters may be derived.

Field welding of encasement pipe shall be performed by a certified welder in accordance with the requirements of AWWA Specification C206-82.

31.3.2 Grout: Grout used to seal the annulus between the excavation and the encasement pipe shall be a 1 to 2 Portland Cement Grout meeting the requirements of Section 601 of the publication Standard Specifications for Road and Bridge Construction (1983 Edition, Kentucky Transportation Cabinet, Department of Highways.

31.3.3 Casing Skids: Casing skids shall be equal to stainless steel casing spacers manufactured by Cascade Waterworks Mfg. Co. of Yorkville, Illinois. Spacer shall consist of a bolt on T-304 stainless steel shell with runners of ultra high molecular weight polymer.

## 31.4 INSTALLATION - BORE AND JACK

**No distinction shall be made between boring through earth or boring through rock. The CONTRACTOR shall conduct his own investigation of subsurface conditions and shall base his bid on his own findings.**

The jacking will be allowed in one direction only. The installation procedure must provide for the placement of the encasement pipe concurrently with the removal of the soil.

Grouting between the excavation and the encasement pipe will be required if ordered by the ENGINEER or if, for any reason, the excavation exceeds one (1) inch larger than the outside diameter of the liner. Grout holes shall be provided in the tunnel lining with a spacing not to exceed four and one-half (4.5) feet measured longitudinally. The location of the holes shall be varied around the periphery of the encasement pipe to suit field conditions which will permit the proper grouting sequence to insure complete filling of void spaces outside the encasement pipe. The CONTRACTOR shall fill all the void space outside the encasement pipe with Portland Cement grout. The machine used for grouting shall permit the application of a pressure up to seventy-five (75) pounds per square inch in excess of any external water pressure. A gage shall be provided which will accurately indicate working pressure and this gage shall be carefully watched during grouting operations. The pressure shall at no time be allowed to exceed that considered safe or which would distort the encasement pipe. Grout pipes shall be one and one-half (1½) inches inside diameter.

The carrier pipe shall be installed after the encasement pipe is in place. The installation of the carrier pipe shall be in accordance with the manufacturer's specifications using casing skids as shown in the Detail Sheets of the Design Drawings. After the carrier pipe has been installed, inspected, and tested as specified, both ends of the encasement pipe shall be closed with a removable, water-tight "boot" in a manner acceptable to the OWNER.

## 31.5 INSTALLATION - OPEN CUT

Where the encasement pipe is placed in open cut, the encasement pipe trenching, bedding, laying, and backfilling shall conform to the requirements of the applicable sections of these Specifications. The carrier pipe shall be installed after the encasement pipe is in place. The installation of the carrier pipe shall be in accordance with the manufacturer's specification using casing skids as shown in the Detail Sheets of the Design Drawings. After the carrier pipe has been installed, inspected, and tested as specified, both ends of the cover pipe shall be closed with a removable, watertight "boot" in a manner acceptable to the OWNER.

## 31.6 MEASUREMENT AND PAYMENT

31.6.1 Measurement: "Bore and Encase for 'X' inch Water Line" of the applicable diameter will be measured by the linear foot of steel encasement pipe furnished, installed, inspected and accepted. "Open Cut Encase for 'X' inch Water Line" of the applicable diameter will be measured by the linear foot of steel encasement pipe furnished, installed, inspected and accepted.

31.6.2 Payment: Payment for "Bore and Encase for 'X' inch Water Line" of the applicable diameter will be made at the contract unit price per linear foot as set forth in the Bid Schedule for the number of feet of encasement pipe measured. Payment for "Open Cut Encase for 'X' inch Water Line" of the applicable diameter will be made at the contract unit price per linear foot as set forth in the Bid Schedule for the number of feet of encasement pipe measured. Such payment shall constitute full compensation for all materials, labor, equipment and incidentals necessary for the completion of the work. Carrier pipe installed in the encasement pipe will be measured and paid for as indicated in the applicable sections of these Specifications.

**- THE END -**

# SECTION XXXII

# TECHNICAL SPECIFICATIONS

# WATER SERVICE CONNECTIONS

## 32.1 SCOPE

This specification governs the provision of water service connections.

## 32.2 GENERAL

The CONTRACTOR shall provide .75" through 1" water service connections in accordance with this specification. Water service connections for meters in excess of 1" shall be provided by OWNER.

## 32.3 QUALITY ASSURANCE/SUBMITTALS

32.3.1 Submit five copies of itemized summary of source of manufacture of each item in water service connection. Provide manufacturer's certification of compliance with specification for each item.

## 32.4 MATERIALS

32.4.1 Service Pipe: Water service pipe shall be 0.75" or 1" seamless copper water tubing Type "K" complying with ASTM-B88 AWWA C800.

32.4.2 Tapping Saddle: Tapping saddles shall be brass band type saddles equal to Ford S70 series for PVC pipe and the Ford 202 series for ductile iron pipe. The saddles shall be threaded to receive the appropriate diameter AWWA corporation stop.

32.4.3 Corporation Stop: Corporation stops shall conform to AWWA C800-84. Corporation stops shall have AWWA CC tapered thread inlets and pack joint or compression outlets for use with copper service line. The stop connections shall be appropriate for the service pipe diameter employed.

32.4.4 Meter Setter: The meter coppersetter shall be equal to the Ford 70 series V172-7 with 7 inch rise. If a pressure reducing valve is specified, a tandem coppersetter equal to a Ford TV172-7 shall be employed.

32.4.5 Meter Box and Lid: The meter box for coppersetters shall be 18" internal diameter High Density Polyethylene Pipe. The meter box and lid shall be equal to the Russco LC218 FB-18. The meter box for tandem coppersetters shall be 18" internal diameter High Density Polyethylene Pipe. The meter box and lid shall be equal to the Russco LC218 FB-18.

32.4.6. Meter: The meter shall be a Sensus 2" Floating Ball Meter with Zurn/Wilkins 975XLRPZ backflow prevention device as indicated.

32.4.7. Pressure Regulating Valve: The pressure reducing valve shall be ¾" or 1" regulator equal to Mueller's H-9310 (No. 2).

32.4.8. Curb Stop: Curb stops shall be equal to a Mueller 110, compression coupling both ends. Curb stop shall be suitable for diameter of service pipe employed. Curb stop shall be furnished complete with curb box and cover.

32.4.9. Recordall Transmitter Register: Each meter shall be furnished with an ORION Integral or Remote for Recordall Transmitter Register.

## 32.5 INSTALLATION

32.5.1. Taps: **AT THE REQUEST OF THE MOUNTAIN WATER DISTRICT, THERE SHALL BE NO DRY TAPS.** The taps shall be made in accordance with the manufacturer's directions. Service line shall be protected by 6" of fine sand or gravel as indicated in the detail drawings.

32.5.2. Meter Setting: The meter settings shall be accomplished in a neat and workmanlike manner. The lid of the meter box shall be set:

1) flush with paved surfaces.
2) 0.5" above grade in improved lawns, and
3) 2" above grade in unimproved areas.

32.5.3. Meter Setting with Double Cut Regulation. Double Cut Regulation Meter Sets shall be required on all services where line pressures exceed 220 psi. One pressure reducing valve shall be installed in a separate box (straight setter) in front of the box containing the meter. The meter and one regulator shall be installed in a second box (tandem setter) immediately beyond the first box. Boxes for the PRV's and the meter shall be constructed no further than three feet apart.

32.5.4 THE CONTRACTOR MAY NOT INSTALL THE METER! A dummy meter shall be used to verify that each setting is installed in the proper working manner. The CONTACTOR shall deliver the meters (suitably boxed) to the OWNER's public works director.

## 32.6 MEASUREMENT AND PAYMENT

32.6.1 Measurement: A water service shall be measured as three quantities. They are: (1) 'X' inch copper water service line, (2) 'X' inch meter set with/without PRV and (3) 'X' inch meter set with double cut regulation. 'X' inch copper water service line in-place, tested and accepted shall be measured in linear feet along the pipe centerline. 'X' inch meter sets shall be measured each. A 'meter set' is defined to include the tapping saddle, corporation stop, meter box, coppersetter, meter, pressure reducing valve(s) (if applicable), meter box(s), lid and curb stop of the 'X' inch diameter.

32.6.2. Payment: Payment for "'X' inch Copper Water Service Line" will be made at the Contract Unit Price set forth in the Bid Schedule for the actual quantity measured. Payment for "'X' Inch Meter Sets", "'X' Inch Meter Set with PRV" or 'X' inch meter sets with double cut regulation will be made at the Contract Unit Price "Each" as set forth in the Bid Schedule. Payment for those items shall be considered full compensation for all materials, labor, equipment and incidentals necessary for the completion of the work.

**- THE END -**

# SECTION XXXIII

# TECHNICAL SPECIFICATIONS

# FIRE HYDRANTS AND BLOW-OFF VALVES

## 33.1 SCOPE

Provide all labor, tools, materials, and equipment to furnish and install the fire hydrants and blow-off valves as shown on the plans.

## 33.2 QUALITY ASSURANCE/SUBMITTALS

33.2.1 All hydrants shall be Mueller Company Model A-423. No other hydrant may be used without consent of the OWNER.

## 33.3 MATERIALS

33.3.1 Hydrant: Hydrants shall conform in all respects to the latest edition of AWWA C502. Hydrant barrel shall have a safety breakage feature above the ground line. All hydrants shall have 6 inch mechanical joint shoe connections, two 2-1/2 inch discharge nozzles and one 4-1/2 inch pumper nozzle with caps fitted with cap chains. Connection threads and operating nuts shall conform to National Standard specifications as adopted by National Board of Fire Underwriters.

Operating nut shall be 1-1/2 inches, and shall open left (counterclockwise). Main valve shall have 5-1/4 inch full opening and be of the compression type opening against water pressure so that the valve remains closed should the barrel be broken off.

Hydrant shall be fully bronze mounted. Main valve shall have a threaded bronze seat ring assembly of such design that it is easily removable by unscrewing from a threaded bronze drain ring. Bronze drain ring shall have multiple ports providing positive automatic drainage as the main valve is opened or closed.

Drainage waterways shall be completely bronze to prevent rust or corrosion.

Operating stem shall be equipped with anti-friction thrust bearing to reduce operating torque and assure easy opening. Stop shall be provided to limit stem travel. Stem threads shall be enclosed in a permanently sealed lubricant reservoir protected from weather and waterway with O-ring seals.

Hydrants shall be designed for 250 psi working pressure and shop tested to 300 psi pressure with main valve both opened and closed. Under test the valve shall not leak, the automatic drains shall function and there shall be no leakage into the bonnet.

33.3.2 Blow-off: The blow off hydrant shall be equal to an Eclipse No. 2 post hydrant. A 4" resilient wedge gate valve conforming to the requirements of the valving section of these Specifications shall be installed upstream of each post hydrant as illustrated in the detail drawings.

## 33.4 INSTALLATION

33.4.1 Hydrants shall have the interior cleaned of all foreign matter prior to installation.

33.4.2 Hydrants shall be set plumb with not less than three cubic feet of crushed stone and backed with at least one cubic foot of Class "C" concrete or equivalent. Additionally, ¾" diameter stainless bridle rod collars or megalug restrained joint gland shall be employed for restraint. The hydrant drain holes shall be thoroughly inspected prior to placement of the crushed stone.

33.4.3 A gate valve must be installed in the service lateral of all hydrants and blowoffs.

33.4.4 The hydrants shall be installed with the pumper nozzle facing the main route of access. The vertical distance from the pumper nozzle to the ground shall be 18 inches.

33.4.5 All hydrant parts shall be inspected in open and closed position to verify working conditions prior to backfilling.

33.4.6 Hydrants and blow-offs shall not be set in the flow line of a ditch or drainage way.

33.4.7 Blow-offs shall be installed in accordance with the details presented in the Design Drawings.

## 33.5 MEASUREMENT AND PAYMENT

33.5.1 Measurement: "Fire Hydrants" in-place, tested and accepted shall be measured "each". "Blow-Offs" in place, tested and accepted shall be measured "each".

33.5.2 Payment: Payment for "Fire Hydrants" and "Blow-Offs" shall be made at the contract unit price "each" as set forth in the Bid Schedule for the actual number of hydrants and blow-offs measured. **The valve provided with a "Fire Hydrant" shall be measured and paid for under the valving section of these specifications. The valve provided with a "Blow-Off" shall be measured and paid for under the valving section of these specifications.** Payment as specified shall be considered full compensation for all labor, materials, equipment, and incidentals necessary to perform the work as required. Crushed stone backfill and concrete thrust backing are considered incidental to the hydrant installation.

**- THE END -**

# SECTION REF

# REFERENCE SPECIFICATIONS

**CONTENTS** **PAGE**

American Water Works Association
ANSI/AWWA C600-93
(Revision of ANSI/AWWA C600-87)

# AWWA STANDARD
# FOR
# INSTALLATION OF DUCTILE-IRON WATER MAINS AND THEIR APPURTENANCES

AMERICAN NATIONAL STANDARD

*Effective date: Apr. 1, 1994.*
*First edition approved by AWWA Board of Directors May 8, 1971.*
*This edition approved June 6, 1993.*
*Approved by American National Standards Institute Feb. 8, 1994.*

AMERICAN WATER WORKS ASSOCIATION
6666 West Quincy Avenue, Denver, Colorado 80235

# SECTION 4: HYDROSTATIC TESTING

*WARNING: The testing methods described in this section are specific for water-pressure testing. These procedures should not be applied for air-pressure testing because of the serious safety hazards involved.*

## Sec. 4.1 Pressure and Leakage Test

4.1.1 *Test restrictions.*

Test pressure shall not be less than 1.25 times the working pressure at the highest point along the test section.

Test pressure shall not exceed pipe or thrust-restraint design pressures.

The hydrostatic test shall be of at least a 2-h duration.

Test pressure shall not vary by more than ±5 psi (34.5 kPa) for the duration of the test.

Valves shall not be operated in either direction at a differential pressure exceeding the rated valve working pressure. Use of a test pressure greater than the

rated valve pressure can result in trapped test pressure between the gates of a double-disc gate valve. For tests at these pressures, the test setup should include a provision, independent of the valve, to reduce the line pressure to the rated valve pressure on completion of the test. The valve can then be opened enough to equalize the trapped pressure with the line pressure, or fully opened if desired.

The test pressure shall not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.

4.1.2 *Pressurization.* After the pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure of at least 1.5 times the working pressure at the point of testing. Each valved section of pipe shall be slowly filled with water, and the specified test pressure (based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge) shall be applied by means of a pump connected to the pipe. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.

4.1.3 *Air removal.* Before applying the specified test pressure, air shall be expelled completely from the section of piping under test. If permanent air vents are not located at all high points, corporation cocks shall be installed at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place as required by the specifications.

4.1.4 *Examination.* All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until satisfactory results are obtained.

4.1.5 *Leakage defined.* Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi (34.5 kPa) of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

4.1.6 *Allowable leakage.* No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

In inch-pound units,

$$L = \frac{SD\sqrt{P}}{133{,}200} \qquad \text{(Eq 1)}$$

Where:

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

RS-3



In metric units,

$$L_m = \frac{SD\sqrt{P}}{715{,}317} \qquad \text{(Eq 2)}$$

Where:

$L_m$ = allowable leakage, in litres per hour
$S$ = length of pipe tested, in metres
$D$ = nominal diameter of the pipe, in millimetres
$P$ = average test pressure during the leakage test, in kPa

These formulas are based on an allowable leakage of 11.65 gpd/mi/in. (1.079 L/day/km/mm) of nominal diameter at a pressure of 150 psi (1034 kPa).

4.1.6.1 Allowable leakage at various pressures is shown in Tables 6A and 6B.

4.1.6.2 When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/h/in. (1.2 mL/h/mm) of nominal valve size shall be allowed.

4.1.6.3 When hydrants are in the test section, the test shall be made against the main valve in the hydrant.

4.1.7 *Acceptance of installation.* Acceptance shall be determined on the basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified in Sec. 4.1.6, repairs or replacements shall be accomplished in accordance with the specifications.

4.1.7.1 All visible leaks are to be repaired regardless of the amount of leakage.

## Table 6A Allowable leakage per 1000 ft of pipeline* — $gph$†

| Avg. Test Pressure psi | Nominal Pipe Diameter—in. | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 64 |
| 450 | 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 | 9.56 | 10.19 |
| 400 | 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 | 9.01 | 9.61 |
| 350 | 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 | 8.43 | 8.99 |
| 300 | 0.38 | 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 | 7.80 | 8.32 |
| 275 | 0.37 | 0.50 | 0.75 | 1.00 | 1.24 | 1.49 | 1.74 | 1.99 | 2.24 | 2.49 | 2.99 | 3.78 | 4.48 | 5.23 | 5.98 | 6.72 | 7.47 | 7.97 |
| 250 | 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 | 7.12 | 7.60 |
| 225 | 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 | 6.08 | 6.76 | 7.21 |
| 200 | 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 | 6.37 | 6.80 |
| 175 | 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 | 5.96 | 6.36 |
| 150 | 0.28 | 0.37 | 0.55 | 0.74 | 0.93 | 1.10 | 1.29 | 1.47 | 1.66 | 1.84 | 2.21 | 2.76 | 3.31 | 3.86 | 4.41 | 4.97 | 5.52 | 5.88 |
| 125 | 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 | 5.04 | 5.37 |
| 100 | 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 | 4.50 | 4.80 |

*If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.
†Calculated on the basis of Eq. 1.

## Table 6B Allowable leakage per 300 m of pipeline* — $L/h$†

| Avg. Test Pressure KPa | Nominal Pipe Diameter—mm | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 76 | 102 | 152 | 203 | 254 | 305 | 356 | 406 | 457 | 508 | 610 | 762 | 914 | 1067 | 1219 | 1400 | 1500 | 1600 |
| 3000 | 1.84 | 2.30 | 3.45 | 4.59 | 5.74 | 6.89 | 8.04 | 9.19 | 10.34 | 11.49 | 13.78 | 17.23 | 20.67 | 22.97 | 27.57 | 32.16 | 34.46 | 36.75 |
| 2800 | 1.78 | 2.22 | 3.33 | 4.44 | 5.55 | 6.66 | 7.77 | 8.88 | 9.99 | 11.10 | 13.32 | 16.64 | 19.97 | 22.19 | 26.63 | 31.07 | 33.29 | 35.51 |
| 2600 | 1.71 | 2.14 | 3.21 | 4.28 | 5.35 | 6.42 | 7.49 | 8.55 | 9.62 | 10.69 | 12.83 | 16.04 | 19.25 | 21.39 | 25.66 | 29.94 | 32.08 | 34.22 |
| 2400 | 1.64 | 2.05 | 3.08 | 4.11 | 5.14 | 6.16 | 7.19 | 8.22 | 9.25 | 10.27 | 12.33 | 15.41 | 18.49 | 20.55 | 24.66 | 28.76 | 30.82 | 32.87 |
| 2200 | 1.57 | 1.97 | 2.95 | 3.93 | 4.92 | 5.90 | 6.88 | 7.87 | 8.85 | 9.84 | 11.80 | 14.75 | 17.70 | 19.67 | 23.61 | 27.54 | 29.51 | 31.47 |
| 2000 | 1.50 | 1.88 | 2.81 | 3.75 | 4.69 | 5.63 | 6.56 | 7.50 | 8.44 | 9.38 | 11.25 | 14.07 | 16.88 | 18.76 | 22.51 | 26.26 | 28.13 | 30.01 |
| 1800 | 1.42 | 1.78 | 2.67 | 3.56 | 4.45 | 5.34 | 6.23 | 7.12 | 8.01 | 8.90 | 10.68 | 13.35 | 16.01 | 17.79 | 21.35 | 24.91 | 26.69 | 28.47 |
| 1600 | 1.34 | 1.68 | 2.52 | 3.36 | 4.19 | 5.03 | 5.87 | 6.71 | 7.55 | 8.39 | 10.07 | 12.58 | 15.10 | 16.78 | 20.13 | 23.49 | 25.16 | 26.84 |
| 1400 | 1.26 | 1.57 | 2.35 | 3.14 | 3.92 | 4.71 | 5.49 | 6.28 | 7.06 | 7.85 | 9.42 | 11.77 | 14.12 | 15.69 | 18.83 | 21.97 | 23.54 | 25.11 |
| 1200 | 1.16 | 1.45 | 2.18 | 2.91 | 3.63 | 4.36 | 5.08 | 5.81 | 6.54 | 7.26 | 8.72 | 10.90 | 13.08 | 14.53 | 17.43 | 20.34 | 21.79 | 23.25 |
| 1000 | 1.06 | 1.33 | 1.99 | 2.65 | 3.32 | 3.98 | 4.64 | 5.30 | 5.97 | 6.63 | 7.96 | 9.95 | 11.94 | 13.26 | 15.91 | 18.57 | 19.89 | 21.22 |
| 800 | 0.95 | 1.19 | 1.78 | 2.37 | 2.97 | 3.56 | 4.15 | 4.74 | 5.34 | 5.93 | 7.12 | 8.90 | 10.68 | 11.86 | 14.23 | 16.61 | 17.79 | 18.98 |
| 600 | 0.82 | 1.03 | 1.54 | 2.05 | 2.57 | 3.08 | 3.60 | 4.11 | 4.62 | 5.14 | 6.16 | 7.70 | 9.25 | 10.27 | 12.33 | 14.38 | 15.41 | 16.44 |

*If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.
†Calculated on the basis of Eq. 2.

American Water Works Association
ANSI/AWWA C651-92
(Revision of ANSI/AWWA C651-86)

# AWWA STANDARD

# FOR

# DISINFECTING WATER MAINS

AMERICAN NATIONAL STANDARD

*Effective date: Feb. 1, 1993.*
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*This edition approved June 18, 1992.*
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AMERICAN WATER WORKS ASSOCIATION

6666 West Quincy Avenue, Denver, Colorado 80235

American Water Works Association

ANSI/AWWA C651-92
(Revision of ANSI/AWWA C651-86)

# AWWA STANDARD FOR

# DISINFECTING WATER MAINS

## SECTION 1: GENERAL

### Sec. 1.1 Scope

This standard presents essential procedures for disinfecting new and repaired water mains. All new water mains shall be disinfected before they are placed in service. All water mains taken out of service for inspection, repair, or other activities that might lead to contamination of water shall be disinfected before they are returned to service.

### Sec. 1.2 References

This standard references the following documents. The latest current edition of each forms a part of this standard where and to the extent specified herein. In case of any conflict, the requirements of this standard shall prevail.

ANSI*/AWWA B300—Standard for Hypochlorites.

ANSI/AWWA B301—Standard for Liquid Chlorine.

*Simplified Procedures for Water Examination.* AWWA Manual M12. AWWA, Denver (1978).

*Standard Methods for the Examination of Water and Wastewater.* APHA,† AWWA, and WEF.‡ Washington, D.C. (18th ed., 1992).

Additional materials relating to activity under this standard include the following:

*Chlorine Manual*—Chlorine Institute Inc.§

*Introduction to Water Treatment.* WSO Series, Vol. 2. AWWA, Denver (1984).

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*American National Standards Institute Inc., 11 W. 42nd St., New York, NY 10036.

†American Public Health Association, 1015 15th St. N.W., Washington, DC 20005.

‡Water Environment Federation, 601 Wythe St., Alexandria, VA 22314.

§Chlorine Institute Inc., 2001 L St. N.W., Washington, DC 20036.

Material Safety Data Sheets for forms of chlorine used (provided by suppliers).

*Safety Practice for Water Utilities.* AWWA Manual M3. AWWA, Denver (1990).

*Water Chlorination Principles and Practices.* AWWA Manual M20. AWWA, Denver (1973).

*Water Quality and Treatment.* AWWA, Denver (4th ed., 1990).

### Sec. 1.3 Record of Compliance

The record of compliance shall be the bacteriological test results certifying the water sampled from the new water main to be free of coliform bacteria contamination, and to be equal to or better than the bacteriologic water quality in the distribution system.

## SECTION 2: FORMS OF CHLORINE FOR DISINFECTION

The forms of chlorine that may be used in the disinfection operations are liquid chlorine, sodium hypochlorite solution, and calcium hypochlorite granules or tablets.

### Sec. 2.1 Liquid Chlorine

Liquid chlorine conforming to ANSI/AWWA B301 contains 100 percent available chlorine and is packaged in steel containers usually of 100-lb, 150-lb, or 1-ton (45.4-kg, 68.0-kg, or 907.2-kg) net chlorine weight. Liquid chlorine shall be used only (1) in combination with appropriate gas-flow chlorinators and ejectors to provide a controlled high-concentration solution feed to the water to be chlorinated; (2) under the direct supervision of a person who is familiar with the physiological, chemical, and physical properties of liquid chlorine, and who is trained and equipped to handle any emergency that may arise; and (3) when appropriate safety practices are observed to protect working personnel and the public.

### Sec. 2.2 Sodium Hypochlorite

Sodium hypochlorite conforming to ANSI/AWWA B300 is available in liquid form in glass, rubber-lined, or plastic containers typically ranging in size from 1 qt (0.95 L) to 5 gal (18.92 L). Containers of 30 gal (113.6 L) or larger may be available in some areas. Sodium hypochlorite contains approximately 5 percent to 15 percent available chlorine, and care must be taken to control conditions and length of storage to minimize its deterioration. (Available chlorine is expressed as a percent of weight when the concentration is 5 percent or less, and usually as a percent of volume for higher concentrations. Percent × 10 = grams of available chlorine per litre of hypochlorite.)

### Sec. 2.3 Calcium Hypochlorite

Calcium hypochlorite conforming to ANSI/AWWA B300 is available in granular form or in 5-g tablets, and contains approximately 65 percent available chlorine by weight. The material should be stored in a cool, dry, and dark environment to minimize its deterioration.

# SECTION 3: BASIC DISINFECTION PROCEDURE

The basic disinfection procedure consists of

1. Preventing contaminating materials from entering the water main during storage, construction, or repair.
2. Removing, by flushing or other means, those materials that may have entered the water main.
3. Chlorinating any residual contamination that may remain, and flushing the chlorinated water from the main.
4. Protecting the existing distribution system from backflow due to hydrostatic pressure test and disinfection procedures.
5. Determining the bacteriological quality by laboratory test after disinfection.
6. Final connection of the approved new water main to the active distribution system.

# SECTION 4: PREVENTIVE AND CORRECTIVE MEASURES DURING CONSTRUCTION

Heavy particulates generally contain bacteria and prevent even very high chlorine concentrations from contacting and killing such organisms. It is, therefore, essential that the procedures of this section be observed to assure that a water main and its appurtenances are thoroughly clean for the final disinfection by chlorination. Also, any connection of new water main to the active distribution system prior to receipt of satisfactory bacteriological samples may constitute a cross-connection. Therefore, the new main must be isolated until bacteriological tests described in Sec. 7 of this standard are satisfactorily completed.

## Sec. 4.1 Keeping Pipe Clean and Dry

Precautions shall be taken to protect the interiors of pipes, fittings, and valves against contamination. Pipe delivered for construction shall be strung so as to minimize the entrance of foreign material. All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons, such as rest breaks or meal periods. Rodent-proof plugs may be used when it is determined that watertight plugs are not practicable and when thorough cleaning will be performed by flushing or other means.

Delay in placement of delivered pipe invites contamination. The more closely the rate of delivery is correlated to the rate of pipe laying, the lower the risk of contamination.

## Sec. 4.2 Joints

Joints of all pipe in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

## Sec. 4.3 Packing Materials

Yarning or packing material shall consist of molded or tubular rubber rings, rope of treated paper, or other approved materials. Materials such as jute or hemp shall not be used. Packing material shall be handled in a manner that avoids contamination. If asbestos rope is used, it shall be handled in a manner that prevents asbestos from being introduced into the water-carrying portion of the pipe.

## Sec. 4.4 Sealing Materials

No contaminated material or any material capable of supporting prolific growth of microorganisms shall be used for sealing joints. Sealing material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water. It shall be delivered to the job in closed containers and shall be kept clean.

## Sec. 4.5 Cleaning and Swabbing

If dirt enters the pipe, it shall be removed and the interior pipe surface swabbed with a 1 percent hypochlorite disinfecting solution. If, in the opinion of the purchaser (or the purchaser's representative), the dirt remaining in the pipe will not be removed by the flushing operation, then the interior of the pipe shall be cleaned by mechanical means such as a hydraulically propelled foam pig (or other suitable device acceptable to the purchaser) in conjunction with the application of a 1 percent hypochlorite disinfecting solution to the interior pipe surface. The cleaning method used shall not force mud or debris into the interior pipe-joint spaces and shall be acceptable to the purchaser.

## Sec. 4.6 Wet-Trench Construction

If it is not possible to keep the pipe and fittings dry during installation, every effort shall be made to ensure that any of the water that may enter the pipe-joint spaces contains an available-chlorine concentration of approximately 25 mg/L. This may be accomplished by adding calcium hypochlorite granules or tablets to each length of pipe before it is lowered into a wet trench, or by treating the trench water with hypochlorite tablets.

## Sec. 4.7 Flooding by Storm or Accident During Construction

If the main is flooded during construction, it shall be cleared of the floodwater by draining and flushing with potable water until the main is clean. The section exposed to the floodwater shall then be filled with a chlorinated potable water that, at the end of a 24-h holding period, will have a free chlorine residual of not less than 25 mg/L. The chlorinated water may then be drained or flushed from the main. After construction is completed, the main shall be disinfected using the continuous-feed or slug method.

## Sec. 4.8 Backflow Protection (Optional)*

As an optional procedure (if specified by the purchaser), the new water main shall be kept isolated from the active distribution system by physical separation (see Figure 1) until satisfactory bacteriological testing has been completed and the

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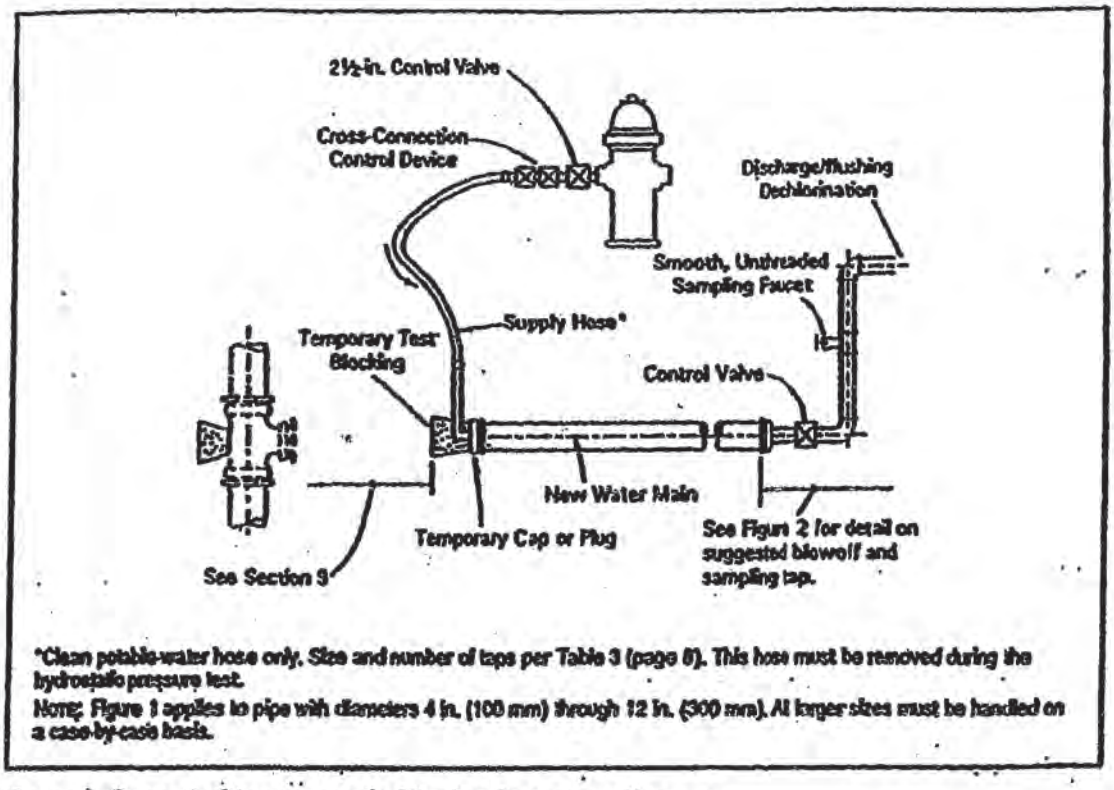
*Optional Sec. 4.8 is not included as part of the standard unless specifically identified in the purchaser's specifications.




*Clean potable-water hose only. Size and number of taps per Table 3 (page 8). This hose must be removed during the hydrostatic pressure test.
Note: Figure 1 applies to pipe with diameters 4 in. (100 mm) through 12 in. (300 mm). All larger sizes must be handled on a case-by-case basis.

Figure 1 Suggested temporary flushing/testing connection

disinfectant water flushed out. Water required to fill the new main for hydrostatic pressure testing, disinfection, and flushing shall be supplied through a temporary connection between the distribution system and the new main. The temporary connection shall include an appropriate cross-connection control device consistent with the degree of hazard, and shall be disconnected (physically separated) from the new main during the hydrostatic pressure test. It will be necessary to reestablish the temporary connection after completion of the hydrostatic pressure test to flush out the disinfectant water prior to final connection of the new main to the distribution system.

## SECTION 5: METHODS OF CHLORINATION

Three methods of chlorination are explained in this section: tablet, continuous feed, and slug. Information in the foreword will be helpful in determining the method to be used. The tablet method gives an average chlorine dose of approximately 25 mg/L; the continuous-feed method gives a 24-h chlorine residual of not less than 10 mg/L; and the slug method gives a 3-h exposure of not less than 50 mg/L free chlorine.

Table 1 Ounces of calcium hypochlorite granules to be placed at beginning of main and at each 500-ft interval

| Pipe Diameter | | Calcium Hypochlorite Granules | |
|---|---|---|---|
| in. | (mm) | oz | (g) |
| 4 | (100) | 0.5 | (14) |
| 6 | (150) | 1.0 | (28) |
| 8 | (200) | 2.0 | (57) |
| 12 | (250) | 4.0 | (113) |
| 16 and larger | (400 and larger) | 8.0 | (227) |

## Sec. 5.1 Tablet Method

The tablet method consists of placing calcium hypochlorite granules or tablets in the water main as it is being installed and then filling the main with potable water when installation is completed.

This method may be used only if the pipes and appurtenances are kept clean and dry during construction.

5.1.1 *Placing of calcium hypochlorite granules.* During construction, calcium hypochlorite granules shall be placed at the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500-ft intervals. The quantity of granules shall be as shown in Table 1.

*WARNING: This procedure must not be used on solvent-welded plastic or on screwed-joint steel pipe because of the danger of fire or explosion from the reaction of the joint compounds with the calcium hypochlorite.*

5.1.2 *Placing of calcium hypochlorite tablets.* During construction, 5-g calcium hypochlorite tablets shall be placed in each section of pipe. Also, one such tablet shall be placed in each hydrant, hydrant branch, and other appurtenance. The number of 5-g tablets required for each pipe section shall be $0.0012\ d^2L$ rounded to the next higher integer, where $d$ is the inside pipe diameter, in inches, and $L$ is the length of the pipe section, in feet. Table 2 shows the number of tablets required for commonly used sizes of pipe. The tablets shall be attached by a food-grade adhesive.* There shall be no adhesive on the tablet except on the broadside attached to the surface of the pipe. Attach all the tablets inside and at the top of the main, with approximately equal numbers of tablets at each end of a given pipe length. If the tablets are attached before the pipe section is placed in the trench, their position shall be marked on the section so it can be readily determined that the pipe is installed with the tablets at the top.

5.1.3 *Filling and contact.* When installation has been completed, the main shall be filled with water at a rate such that water within the main will flow at a

*Examples of food-grade adhesives are Permatex Form-A-Gasket No. 2 and Permatex Clear RTV Silicone Adhesive Sealant, which are manufactured by Loctite Corporation, Kansas City, KS 66115. These products have both been approved by the US Drug Administration (USDA) for uses that may involve contact with edible products. Neither product has been approved in accordance with NSF 61. Other company products, such as Permatex Form-A-Gasket No. 1, have not received FDA approval.

Table 2 Number of 5-g calcium hypochlorite tablets required for dose of 25 mg/L*

| Pipe Diameter in. | (mm) | Length of Pipe Section, ft (m) 13 (4.0) or less | 18 (5.5) | 20 (6.1) | 30 (9.1) | 40 (12.2) |
|---|---|---|---|---|---|---|
| | | Number of 5-g Calcium Hypochlorite Tablets | | | | |
| 4 | (100) | 1 | 1 | 1 | 1 | 1 |
| 6 | (150) | 1 | 1 | 1 | 2 | 2 |
| 8 | (200) | 1 | 2 | 2 | 3 | 4 |
| 10 | (250) | 2 | 3 | 3 | 4 | 5 |
| 12 | (300) | 3 | 4 | 4 | 6 | 7 |
| 16 | (400) | 4 | 6 | 7 | 10 | 13 |

*Based on 3.25-g available chlorine per tablet; any portion of tablet rounded to next higher integer.

velocity no greater than 1 ft/s (0.3 m/s). Precautions shall be taken to ensure that air pockets are eliminated. This water shall remain in the pipe for at least 24 h. If the water temperature is less than 41°F (5°C), the water shall remain in the pipe for at least 48 h. As an optional procedure (if specified by the purchaser), water used to fill the new main shall be supplied through a temporary connection that shall include an appropriate cross-connection control device, consistent with the degree of hazard, for backflow protection of the active distribution system (see Figure 1).

## Sec. 5.2 Continuous-Feed Method

The continuous-feed method consists of placing calcium hypochlorite granules in the main during construction (optional), completely filling the main to remove all air pockets, flushing the completed main to remove particulates, and filling the main with potable water. The potable water shall be chlorinated so that after a 24-h holding period in the main there will be a free chlorine residual of not less than 10 mg/L.

5.2.1 *Placing of calcium hypochlorite granules.* At the option of the purchaser, calcium hypochlorite granules shall be placed in pipe sections as specified in Sec. 5.1.1. The purpose of this procedure is to provide a strong chlorine concentration in the first flow of flushing water that flows down the main. In particular, this procedure is recommended when the type of pipe is such that this first flow of water will flow into annular spaces at pipe joints.

5.2.2 *Preliminary flushing.* Before being chlorinated, the main shall be filled to eliminate air pockets and shall be flushed to remove particulates. The flushing velocity in the main shall not be less than 2.5 ft/s (0.76 m/s) unless the purchaser (or purchaser's representative) determines that conditions do not permit the required flow to be discharged to waste. Table 3 shows the rates of flow required to produce a velocity of 2.5 ft/s (0.76 m/s) in commonly used sizes of pipe. Note that flushing is no substitute for preventive measures during construction. Certain contaminants, such as caked deposits, resist flushing at any feasible velocity.

For 24-in. (600-mm) or larger diameter mains, an acceptable alternative to flushing is to broom-sweep the main, carefully removing all sweepings prior to chlorinating the main.

Table 3 Required flow and openings to flush pipelines (40 psi [276 kPa] residual pressure in water main)*

| Pipe Diameter in. | (mm) | Flow Required to Produce 2.5 ft/s (approx.) Velocity in Main gpm | (L/s) | Size of Tap, in. (mm) 1 (25) | 1½ (38) | 2 (51 mm) | Number of 2½-in. (64-mm) Hydrant Outlets |
|---|---|---|---|---|---|---|---|
| | | | | Number of Taps on Pipe† | | | |
| 4 | (100) | 100 | (6.3) | 1 | — | — | 1 |
| 6 | (150) | 200 | (12.6) | — | 1 | — | 1 |
| 8 | (200) | 400 | (25.2) | — | 2 | 1 | 1 |
| 10 | (250) | 600 | (37.9) | — | 3 | 2 | 1 |
| 12 | (300) | 900 | (56.8) | — | — | 2 | 2 |
| 16 | (400) | 1600 | (100.9) | — | — | 4 | 2 |

*With a 40-psi (276-kPa) pressure in the main and the hydrant flowing to atmosphere, a 2½-in. (64-mm) hydrant outlet will discharge approximately 1000 gpm (63.1 L/s); and a 4½-in. (114-mm) hydrant outlet will discharge approximately 2500 gpm (160 L/s).

†Number of taps on pipe based on discharge through 5 ft (1.5 m) of galvanized iron (GI) pipe with one 90° elbow.

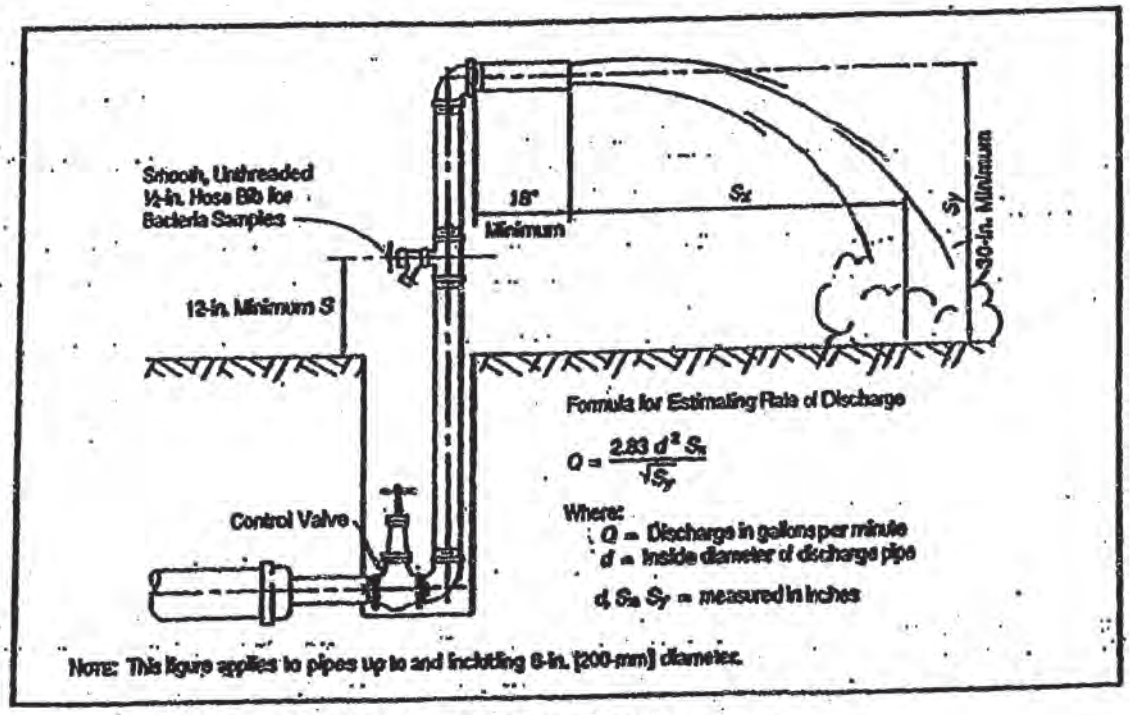



Figure 2 Suggested combination blowoff and sampling tap

5.2.3 *Procedure for chlorinating the main.*

1. Water supplied from a temporary, backflow-protected connection to the existing distribution system or other approved source of supply shall be made to flow at a constant, measured rate into the newly installed water main. In the absence of a meter, the rate may be approximated by methods such as placing a

pressures that may be created by the pumps. All connections shall be checked for tightness before the solution is applied to the main.

### Sec. 5.3 Slug Method

The slug method consists of placing calcium hypochlorite granules in the main during construction, completely filling the main to eliminate all air pockets, flushing the main to remove particulates, and slowly flowing through the main a slug of water dosed with chlorine to a concentration of 100 mg/L. The slow rate of flow ensures that all parts of the main and its appurtenances will be exposed to the highly chlorinated water for a period of not less than 3 h.

5.3.1 *Placing calcium hypochlorite granules.* Same as Sec. 5.2.1.

5.3.2 *Preliminary flushing.* Same as Sec. 5.2.2.

5.3.3 *Chlorinating the main.*

1. Same as Sec. 5.2.3(1).

2. At a point not more than 10 ft (3 m) downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 100 mg/L free chlorine. To ensure that this concentration is achieved, the chlorine concentration should be measured at regular intervals. The chlorine shall be applied continuously and for a sufficient period to develop a solid column, or "slug," of chlorinated water that will, as it moves through the main, expose all interior surfaces to a concentration of approximately 100 mg/L for at least 3 h.

3. The free chlorine residual shall be measured in the slug as it moves through the main. If at any time it drops below 50 mg/L, the flow shall be stopped, chlorination equipment shall be relocated at the head of the slug, and, as flow is resumed, chlorine shall be applied to restore the free chlorine in the slug to not less than 100 mg/L.

4. As the chlorinated water flows past fittings and valves, related valves and hydrants shall be operated so as to disinfect appurtenances and pipe branches.

## SECTION 6: FINAL FLUSHING

### Sec. 6.1 Clearing the Main of Heavily Chlorinated Water

After the applicable retention period, heavily chlorinated water should not remain in prolonged contact with pipe. In order to prevent damage to the pipe lining or corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the distribution system or is acceptable for domestic use.

### Sec. 6.2 Disposing of Heavily Chlorinated Water

The environment into which the chlorinated water is to be discharged shall be inspected. If there is any possibility that the chlorinated discharge will cause damage to the environment, then a neutralizing chemical shall be applied to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water. (See appendix B for neutralizing chemicals.) Where necessary, federal, state, provincial, and local regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water.

Table 4 Chlorine required to produce 25-mg/L concentration in 100 ft (30.5 m) of pipe—by diameter

| Pipe Diameter | | 100 percent Chlorine | | 1 percent Chlorine Solution | |
|---|---|---|---|---|---|
| *in.* | *(mm)* | lb | *(g)* | gal | *(L)* |
| 4 | (100) | .013 | (5.9) | .16 | (0.6) |
| 6 | (150) | .030 | (13.6) | .36 | (1.4) |
| 8 | (200) | .054 | (24.5) | .65 | (2.5) |
| 10 | (250) | .085 | (38.6) | 1.02 | (3.9) |
| 12 | (300) | .120 | (54.4) | 1.44 | (5.4) |
| 16 | (400) | .217 | (98.4) | 2.60 | (9.8) |

Pitot gauge in the discharge, measuring the time to fill a container of known volume, or measuring the trajectory of the discharge and using the formula shown in Figure 2.

2. At a point not more than 10 ft (3 m) downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 25 mg/L free chlorine. To ensure that this concentration is provided, measure the chlorine concentration at regular intervals in accordance with the procedures described in the current edition of *Standard Methods for the Examination of Water and Wastewater* or AWWA Manual M12, or using appropriate chlorine test kits (see appendix A).

Table 4 gives the amount of chlorine required for each 100 ft (30.5 m) of pipe of various diameters. Solutions of 1 percent chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution requires 1 lb (454 g) of calcium hypochlorite in 8 gal (30.3 L) of water.

3. As an optional procedure (if specified by the purchaser), water used to fill the new main during the application of chlorine shall be supplied through a temporary connection. This temporary connection shall be installed with an appropriate cross-connection control device, consistent with the degree of hazard, for backflow protection of the active distribution system (see Figure 1). Chlorine application shall not cease until the entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24 h, during which time all valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances. At the end of this 24-h period, the treated water in all portions of the main shall have a residual of not less than 10 mg/L free chlorine.

4. Direct-feed chlorinators, which operate solely from gas pressure in the chlorine cylinder, shall not be used for the application of liquid chlorine. (The danger of using direct-feed chlorinators is that water pressure in the main can exceed gas pressure in the chlorine cylinder. This allows a backflow of water into the cylinder, resulting in severe cylinder corrosion and escape of chlorine gas.) The preferred equipment for applying liquid chlorine is a solution-feed, vacuum-operated chlorinator and a booster pump. The vacuum-operated chlorinator mixes the chlorine gas in solution water; the booster pump injects the chlorine-gas solution into the main to be disinfected. Hypochlorite solutions may be applied to the water main with a gasoline or electrically powered chemical-feed pump designed for feeding chlorine solutions. Feed lines shall be of such material and strength as to safely withstand the corrosion caused by the concentrated chlorine solutions and the maximum

## SECTION 7: BACTERIOLOGICAL TESTS

### Sec. 7.1 Standard Conditions

After final flushing and before the new water main is connected to the distribution system, two consecutive sets of acceptable samples, taken at least 24 h apart, shall be collected from the new main. At least one set of samples shall be collected from every 1200 ft (366 m) of the new water main, plus one set from the end of the line and at least one set from each branch. All samples shall be tested for bacteriological quality in accordance with *Standard Methods for the Examination of Water and Wastewater*, and shall show the absence of coliform organisms. A standard heterotrophic plate count may be required at the option of the purchaser (or purchaser's representative).

### Sec. 7.2 Special Conditions

If trench water has entered the new main during construction or, if in the opinion of the purchaser (or purchaser's representative), excessive quantities of dirt or debris have entered the new main, bacteriological samples shall be taken at intervals of approximately 200 ft (61 m) and shall be identified by location. Samples shall be taken of water that has stood in the new main for at least 16 h after final flushing has been completed.

### Sec. 7.3 Sampling Procedure

Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate as required by *Standard Methods for the Examination of Water and Wastewater*. No hose or fire hydrant shall be used in the collection of samples. A suggested combination blowoff and sampling tap useful for mains up to and including 8-in. (200-mm) diameter is shown in Figure 2. A corporation cock may be installed in the main with a copper-tube gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed and retained for future use.

## SECTION 8: REDISINFECTION

If the initial disinfection fails to produce satisfactory bacteriological results, the new main may be reflushed and shall be resampled. If check samples also fail to produce acceptable results, the main shall be rechlorinated by the continuous-feed or slug method of chlorination until satisfactory results are obtained.

NOTE: High velocities in the existing system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is advisable to sample water entering the new main.

## SECTION 9: FINAL CONNECTIONS TO EXISTING MAINS (OPTIONAL)*

As an optional procedure (if specified by the purchaser), water mains and appurtenances must be completely installed, flushed, disinfected, and satisfactory

*Optional Sec. 9 is not included as part of the standard unless specifically identified in the purchaser's specifications.

bacteriological sample results received prior to permanent connections being made to the active distribution system. Sanitary construction practices must be followed during installation of the final connection, so that there is no contamination of the new or existing water main with foreign material or groundwater.

### Sec. 9.1 Connections Equal To or Less Than One Pipe Length (≤ 18 ft [5.5 m])

As an optional procedure (if specified by the purchaser), the new pipe, fittings, and valve(s) required for the connection may be spray-disinfected or swabbed with a minimum 1 percent solution of chlorine just prior to being installed, if the total length of connection from the end of a new main to the existing main is equal to or less than 18 ft (5.5 m).

### Sec. 9.2 Connections Greater Than One Pipe Length (>18 ft [5.5 m])

As an optional procedure (if specified by the purchaser), the pipe required for the connection must be set up aboveground, disinfected, and bacteriological samples taken, as described in Sec. 5 through Sec. 8, if the total length of connection from the end of a new main to the existing main is greater than 18 ft (5.5 m). After satisfactory bacteriological sample results have been received for this "pre-disinfected" pipe, the pipe can be used in connecting the new main to the active distribution system. Between the time that satisfactory bacteriological sample results are received and the time that the connection piping is installed, the ends of this piping must be sealed with plastic wraps or watertight plugs or caps.

## SECTION 10: DISINFECTION PROCEDURES WHEN CUTTING INTO OR REPAIRING EXISTING MAINS

The following procedures apply primarily when existing mains are wholly or partially dewatered. After the appropriate procedures have been completed, the existing main may be returned to service prior to completion of bacteriological testing in order to minimize the time customers are out of water. Leaks or breaks that are repaired with clamping devices while the mains remain full of pressurized water present little danger of contamination and require no disinfection.

### Sec. 10.1 Trench Treatment

When an existing main is opened, either by accident or by design, the excavation will likely be wet and may be badly contaminated from nearby sewers. Liberal quantities of hypochlorite applied to open trench areas will lessen the danger from such pollution. Tablets have the advantage in such a situation because they dissolve slowly and continue to release hypochlorite as water is pumped from the excavation.

### Sec. 10.2 Swabbing With Hypochlorite Solution

The interior of all pipe and fittings (particularly couplings and sleeves) used in making the repair shall be swabbed or sprayed with a 1 percent hypochlorite solution before they are installed.

### Sec. 10.3 Flushing

Thorough flushing is the most practical means of removing contamination introduced during repairs. If valve and hydrant locations permit, flushing toward

the work location from both directions is recommended. Flushing shall be started as soon as the repairs are completed and shall be continued until discolored water is eliminated.

### Sec. 10.4 Slug Chlorination

When practical, in addition to the procedures above, the section of main in which the break is located shall be isolated, all service connections shut off, and the section flushed and chlorinated as described in Sec. 5.3, except that the dose may be increased to as much as 300 mg/L and the contact time reduced to as little as 15 min. After chlorination, flushing shall be resumed and continued until discolored water is eliminated, and the water is free of noticeable chlorine odor.

### Sec. 10.5 Sampling

Bacteriological samples shall be taken after repairs are completed to provide a record for determining the procedure's effectiveness. If the direction of flow is unknown, then samples shall be taken on each side of the main break. If positive bacteriological samples are recorded, then the situation shall be evaluated by the purchaser (or purchaser's representative) who can determine corrective action, and daily sampling shall be continued until two consecutive negative samples are recorded.

## SECTION 11: SPECIAL PROCEDURE FOR CAULKED TAPPING SLEEVES

Before a tapping sleeve is installed, the exterior of the main to be tapped shall be thoroughly cleaned, and the interior surface of the sleeve shall be lightly dusted with calcium hypochlorite powder.

Tapping sleeves are used to avoid shutting down the main to be tapped. After the tap is made, it is impossible to disinfect the annulus without shutting down the main and removing the sleeve. The space between the tapping sleeve and the tapped pipe is normally ½ in. (13 mm), more or less, so that as little as 100 mg/ft$^2$ of calcium hypochlorite powder will provide a chlorine concentration of over 50 mg/L.

# APPENDIX A
## Chlorine Residual Testing

*This appendix is for information only and is not a part of AWWA C651.*

## SECTION A.1: DPD DROP DILUTION METHOD (FOR FIELD TEST)

The DPD drop dilution method of approximating total residual chlorine is suitable for concentrations above 10 mg/L, such as are applied in the disinfection of water mains or tanks.

### Sec. A.1.1 Apparatus

1. A graduated cylinder for measuring distilled water.
2. An automatic or safety pipette.
3. Two dropping pipettes that deliver a 1-mL sample in 20 drops. One pipette is for dispensing the water sample, and the other is for dispensing the DPD and buffer solutions. The pipettes should not be interchanged.
4. A comparator kit containing a suitable range of standards.

### Sec. A.1.2 Reagents

1. DPD indicator solution. Prepare as prescribed in *Standard Methods for the Examination of Water and Wastewater* (18th ed.), Section 4500-Cl G, p. 4-62.

### Sec. A.1.3 Procedure

1. Add 10 drops of DPD solution and 10 drops of buffer solution (or 20 drops of combined DPD–buffer solution) to a comparator cell.
2. Fill the comparator cell to the 10-mL mark with distilled water.
3. With a dropping pipette, add the water sample one drop at a time, allowing mixing, until a red color is formed that matches one of the color standards.
4. Record the total number of drops used and the final chlorine reading obtained (that is, the chlorine reading of the matched standard).
5. Calculate the milligrams per litre of free residual chlorine as follows:

$$\text{mg/L chlorine} = \frac{\text{reading} \times 200}{\text{drops of sample}}$$

## SECTION A.2: HIGH-RANGE CHLORINE TEST KITS

Several manufacturers produce high-range chlorine test kits that are inexpensive, easy to use, and satisfactory for the precision required.

# APPENDIX B

## Disposal of Heavily Chlorinated Water

*This appendix is for information only and is not a part of AWWA C651.*

1. Check with the local sewer department for conditions of disposal to sanitary sewer.

2. Chlorine residual of water being disposed will be neutralized by treating with one of the chemicals listed in Table B.1.

Table B.1 Amounts of chemicals required to neutralize various residual chlorine concentrations in 100,000 gal (378.5 $m^3$) of water

| Residual Chlorine Concentration | Chemical Required | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Sulfur Dioxide ($SO_2$) | | Sodium Bisulfite ($NaHSO_3$) | | Sodium Sulfite ($Na_2SO_3$) | | Sodium Thiosulfate ($Na_2S_2O_3 \cdot 5H_2O$) | |
| mg/L | lb | (kg) | lb | (kg) | lb | (kg) | lb | (kg) |
| 1 | 0.8 | (.36) | 1.2 | (.54) | 1.4 | (.64) | 1.2 | (.54) |
| 2 | 1.7 | (.77) | 2.5 | (1.13) | 2.9 | (1.32) | 2.4 | (1.09) |
| 10 | 8.3 | (3.76) | 12.5 | (5.67) | 14.6 | (6.62) | 12.0 | (5.44) |
| 50 | 41.7 | (18.91) | 62.6 | (28.39) | 73.0 | (33.11) | 60.0 | (27.22) |

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MWD

Mountain Water District

# WATER DISTRIBUTION LINES TECHNICAL SPECIFICATIONS

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## WATER DISTRIBUTION LINES TECHNICAL SPECIFICATIONS

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# TECHNICAL SPECIFICATIONS

## SECTION I

## GENERAL REQUIREMENTS

### 1.1 Statement of Work

The requirements herein are intended to apply to those items of labor, tools, materials and equipment necessary for the construction of the water distribution lines and appurtenances as shown on the plans and described in the specifications. These requirements will apply to both new and replacement projects.

### 1.2 Preconstruction Conference

Prior to the start of any construction, the Contractor (and Developer if the project is in a subdivision and the work is being done for the DEVELOPER to be turned over to the District at completion of construction) shall attend a conference at the project site with the District Inspector and the Design Engineer. At this meeting, a general construction schedule will be developed so that the District inspection and testing services can be planned. The CONTRACTOR'S Job Foreman will be designated at this meeting, and communication at the job site between the District representative and the CONTRACTOR shall be through this individual.

### 1.3 Inspection

All construction work for the Utility or work done for or by a DEVELOPER that will connect to the District water system shall be subject to inspection and approval by the District Inspector. No water line shall be installed and covered without approval of the District Inspector. Sufficient notice (Preferably 3 District working days) shall be given prior to the requirement for inspection by the District Inspector. The District Inspector shall also make periodic inspections throughout the project.

### 1.4 Plans, Construction Staking and Cut-Sheets

The CONTRACTOR shall have on the job site at all times at least one individual who is competent to read and understand the plans.

## 1.5 Safety

The CONTRACTOR will provide adequate protection to safeguard and protect the public and workmen when working on public right-of-ways and property.

The CONTRACTOR shall be subject to inspection by the designated Safety Inspector, and will be required to abide by the Safety Inspector's recommendations and will be subject to work stoppage if compliance is not made.

## 1.6 Caution in Excavation

The CONTRACTOR shall proceed with caution in the excavation and preparation of the trench so that the exact location of underground structures, both known and unknown, may be determined. The location of existing underground structures should be determined by the CONTRACTOR enough in advance of the pipe-laying to provide for a change of design alignment by the Design Engineer, if required. Any loss or damage to the site or to the underground or surface utility within the site are due to construction activities shall be borne by the CONTRACTOR.

## 1.7 Approved Plans

No work shall commence on any water system until the CONTRACTOR has in this possession a complete set of approved plans prepared by a professional Engineer, registered in Kentucky, whose signed seal shall appear on each plan sheet. Each set of plans shall also be approved and signed by the Superintendent of the Mountain Water District. Any significant change from the original approved plans shall require an additional approval from the Superintendent. Verbal approval from the District Inspector shall decide whether a change is a minor change or a significant change.

## 1.8 Separation of Water Lines and Sanitary Sewers

### 1.8.1 General

The following factors shall be considered in providing adequate separation:

a. Materials and types of joints for water and sewer pipes,

b. Soil conditions,

c. Service branch connections into the water line and sewer lines,

d. Compensating variations in the horizontal and vertical separations.

e. Space for repairs and alterations of water and sewer pipe,

f. Offsetting of pipes around manholes.

1.8.2 Parallel Installation

a. Normal Conditions - Water lines shall be laid at least ten feet horizontally from a sewer or sewer manhole whenever possible, the distance shall be measured edge-to-edge.

b. Unusual Conditions - When local conditions prevent a horizontal separation of ten feet, the water line may be laid closer to a sewer or sewer manhole provided that:

1. The bottom of the water line is at least 18 inches above the top of the sewer.

2. Where this vertical separation cannot be obtained, the sewer shall be constructed of AWWA approved ductile iron water pipe, pressure-tested in place to 50 psi without leakage prior to backfilling.

3. The sewer manhole shall be of watertight construction tested in place.

1.8.3 Crossing

a. Normal Conditions - Water lines crossing sewers shall be laid to provide a separation of at least 18 inches between the bottom of water line and the top of the sewer whenever possible.

b. Unusual Conditions - When local conditions prevent a vertical separation described in 1.8.3a, the following construction shall be used:

1. Sewers passing over or under water lines shall be constructed of the materials described in 1.8.2.b2.

2. Water lines passing under sewers shall, in addition, be protected by providing:

a. A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water line.

b. Adequate structural support for the sewers to prevent excessive deflection of the joints and settling on and breaking water line.

c. That a joint of the water line be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the sewer.

1.8.4 Sanitary Sewers or Sewer Manholes

No water pipes shall pass through or come in contact with any part of a sewer or sewer manhole.

1.8.5 Surface Water Crossing

Surface water crossings, both over and under water, shall be discussed with the Design Engineer before final plans are prepared.

1.8.5.1 Above Water Crossing

There shall be no above-water crossings allowed.

1.8.5.2 Under Water Crossing

a. The pipe shall be of a special construction, having flexible watertight joints.

b. Valves shall be provided at both ends of the water crossing so that the section can be isolated for tests or repair; the valves shall be easily accessible and not subject to flooding.

c. All water pipe and flexible watertight joints lying below the water table shall be concrete encased.

d. Permanent taps shall be made for testing and locating leaks. For stream crossings, a standard meter box, cover and copper setter shall be installed on the stream side nearest the source of supply.

## 1.9 Bored and Cased Crossings

When casing pipe is required for highways, railroad or other crossings, the project shall be completed in accordance with all applicable federal, state, and local regulations. In the case of railroad crossings, the project shall comply further with regulations established by the specific railroad company. In general, boring will be permitted for casing diameters through 36 inches with maximum length of about 175 feet, jacking for diameters 30 inches through 60 inches with lengths of about 200 feet; and tunneling for pipes 48 inches and larger for longer lengths. Spacers shall be used, as shown on drawing MW-11, and rubber boots to seal each end of casings.

## 1.10 Plans Required on the Job Site

The CONTRACTOR shall keep at the job site at all times two sets of approved plans and one set of project specifications shall be required.

## 1.11 Exceptions

Exceptions may be made to these specifications in cases where engineering data is presented to the District by a registered Engineer which show the suitability of some alternate method or material. Such a request for approval of an exception shall be made in writing, properly documented, to the District. The responsibility and authority for granting an exception to these specifications shall rest with the District.

## 1.12 Future Location of Water Mains

In order that PVC water mains may be located in the future and that all mains be protected from excavating equipment damaging the line, a metallic tape and locator wire shall be laid on top of the first lift being 12 inches over the crown of the pipe. The tape shall be continuous for the entire length of the pipe laid including all branches and junctions. This tape shall have a printed warning indicating the utility located beneath it. In addition to warning tape, there shall be installed a 14 gage locator wire continuous throughout the project. The wire shall be pulled in all valve boxes and hydrant areas.

## 1.13 Maintenance Period

After acceptance of the constructed water facilities and a complete set of as-built plans have been received by the District, the water facilities may be placed into service. The contractor shall be

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responsible for the maintenance of the facilities for a period of not less than twelve (12) months. This period shall commence after formal acceptance of the water facilities by the District. The contractor shall repair any and all defects as determined by the District in the facilities that occur during the prescribed period prior to final acceptance of the new facilities into the District water system and maintenance responsibilities by the District. If such repairs are made the warranty shall extend to a period of one (1) year from the date of repair on said area.

The District may, at its option, make repairs during the warranty period of an emergency exists, i.e., loss of service to customers, or, if in the opinion of the Superintendent of Operations Manager, contractor could not begin repairs within 2 (two) hours. Contractor will reimburse the District for all costs associated with said repairs and overhead and administrative costs.

# TECHNICAL SPECIFICATIONS

## SECTION II

## EXCAVATION, INSTALLATION AND BACKFILLING

### 2.1 Classification

Excavation shall be unclassified regardless of material encountered.

### 2.2 Clearing

Only that portion of the right-of-way easement actually needed for construction shall be cleared, unless directed otherwise by the INSPECTOR. In no case shall clearing of debris from clearing operations be taken past right-of-way easement lines into private property. Areas disturbed by construction operations shall be protected from erosion by suitable methods outlined by the Utility.

### 2.3 Excavation and Preparation of Trench

#### 2.3.1 Cover

Pipe shall have a minimum cover of 36", unless otherwise shown on the plans and approved.

#### 2.3.2 Bedding

Generally bedding will be Type 1 as depicted on Detail Sheet MW-5 for All Water Mains. Alternate types of bedding may be required due to special soil or load conditions and shall be specified by the Design Engineer or District.

#### 2.3.3 Width

Width shall be sufficient to allow laying without walking or standing on the pipe and shall not be less than 6" on each side of the pipes largest diameter.

#### 2.3.4 Bell Holes

Bell holes shall be excavated to accommodate each bell.

### 2.3.5 Rock Excavation

Ledge rock, boulders, and large stones shall be removed to provide a clearance of at least 6" below and on each side of all pipe valves and fittings. Before the pipe is laid, the subgrade shall be made by backfilling with approved material and shall be tamped and graded as specified in Section 2.3. No blasting shall be permitted.

### 2.3.6 Excavation to Grade

The trench shall be excavated so as to provide a uniform and continuous bearing and support for the pipe on solid and undisturbed ground at every point between bell holes, except that it will be permissible to disturb and otherwise damage the finished surface over a maximum length of 18 inches near the middle of each length of pipe by the withdrawal of pipe slings or other lifting tackle. Any specified grade shall be corrected with approved material, thoroughly compacted as directed by the INSPECTOR. The finished subgrade shall be prepared accurately by means of hand tools.

The subgrade beneath the centerline of the pipe shall be finished to within 0.03 feet of a straight line between pipe joints or batter boards, and all tolerances shall be above the specified grade.

### 2.3.7 Unsuitable Material

Wet or otherwise unsuitable soil at the subgrade shall be removed and replaced with approved sound materials. Excess or unsuitable material shall be disposed of by the CONTRACTOR.

### 2.3.8 Topsoil Storage

Topsoil to be used in backfilling shall be stockpiles separately from other backfill materials.

### 2.3.9 Trench Protection

The CONTRACTOR shall furnish and erect such sheathing, bracing and shoring, and shall furnish necessary signs, barricades and temporary lighting as may be pertinent for the protection of his work, employees, the public, adjacent structures and to guard against contingencies which might give rise to delays in the work. Sheathing left in place shall be at the CONTRACTOR'S expense. Responsibility for preservation of trench banks and other excavated spaces and the prevention of injury to any persons or property shall rest entirely with the CONTRACTOR.

### 2.3.10 Pumping, Bailing & Drainage

The CONTRACTOR shall remove by pumping, bailing, or other appropriate means any damaging water which may accumulate or be found in the trenches or other excavations and shall form dams, flumes or effect other means to keep the excavations clear of water while work is in progress.

### 2.3.11 Blasting

No Blasting shall be permitted.

### 2.3.12 Excavation in Pavement

When pavement must be cut, the cut shall be made in a straight line, parallel to the pipe and 6 inches wider than the trench, on each side, so that an undisturbed shoulder will be provided under the new work. Sidewalks or curb and gutter disturbed by construction shall be removed and replaced at existing joints. Cutting shall be done neatly so that a uniform, straight joint will result to provide a bond with the original concrete or pavement.

Where trenches cross streets, not more than one-half of the street width shall be disturbed at one time, and the first trench opening shall be restored to satisfactory travelable condition before the second half is excavated. Placement of excavated material on existing pavement shall be avoided wherever possible, and when so placed, the pavement shall be satisfactorily cleaned by an approved method. No cleated equipment shall be used on pavements. Street drainage shall not be clogged and shoulders and ditches affected by trenching operations shall be maintained in satisfactory condition. Entrances shall not be blocked except for short periods, and ingress and egress to adjacent property shall be maintained at all times.

Traffic shall not be blocked or re-routed without permission from the Kentucky Department of Transportation, County, or other governing agencies.

Detail Sheet MW-10 exhibits acceptable method of pavement replacing methods.

## 2.4 Installation of Pipe, Fittings and Accessories

### 2.4.1 Placement

Pipe shall be placed in the trench in such a manner as to prevent damage to pipe and protective coatings and linings. Under no circumstances shall pipe be dropped or dumped into the trench.

### 2.4.2 Cleaning

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in line. Spigot and bell ends of pipe and gaskets shall be cleaned and lubricated according to the manufacturer's instructions. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug.

### 2.4.3 Direction of Laying

Pipe shall be laid with bell ends facing in the direction of laying, unless directed otherwise by the *DESIGN ENGINEER*. Where pipe is laid on grade of 10 percent or greater, the laying shall start at the bottom and shall proceed upward with the bell ends of the pipe upgrade.

### 2.4.4 Deflection at Joints

Maximum deflection for mechanical joints and push-on joints shall be as follows:

| Pipe Size | Mechanical Joint Allowable Deflection in Inches — Lengths 18' | 20' | Push-On Allowable Deflection in Inches — Lengths 18' | 20' |
|---|---|---|---|---|
| 4" | 31 | 35 | 19 | 21 |
| 6" | 27 | 30 | 19 | 21 |
| 8" | 20 | 22 | 19 | 21 |
| 10" | 20 | 22 | 19 | 21 |
| 12" | 20 | 22 | 19 | 21 |

### 2.4.5 Setting of Valves, Hydrants, and Fittings

A valve box and marker shall be provided for every valve. 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 finished pavement or such other level as may be directed. Hydrants shall be set so that the center of the outlet is 16 to 18 inches above finished grade when connected to the main and shall be tied to main or anchored to control thrust. Provide at least 3 C.F. of crushed stone or gravel under base to allow drainage from the hydrant drain valve. Fire hydrants shall not be set where seasonal groundwater table or surface flooding, as determined by the District, will prevent drainage from the hydrant barrel. Valve boxes and fire hydrants shall be installed in accordance with Standard Detail Sheets MW-1 and MW-3..

### 2.4.6 Anchorage

Pressure pipe lines shall be protected against joint pulling or thrust damage by suitable anchors, braces, or tie rods installed at direction changes effected by fittings and all other critical points(i.e., in-line valves, etc.). Thrust blocks shall be of the size indicated on the drawings and shall bear on solid undisturbed earth.

### 2.4.7 Testing

CONTRACTOR shall make all preparation, furnish all equipment, and shall supply the labor for all tests. Pressure and leakage tests shall be in accordance with AWWA C.600, Section 4.1 and 4.2. Test pressure shall be a minimum of 150 psi or 50 psi above the standard operating pressure or 67% of the pipe rating whichever is greater. In addition, the hydrostatic test boundaries shall be each valved section of the waterline and each valve shall be as a minimum subjected to test pressure on one side. Allowable leakage shall not be greater than that determined by the following formula:

```
1 gallon per inch of pipe diameter per mile per 24 hours
```

in which L is the allowable leakage, in gallons per hour; S is the length of pipe tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test in pounds per square inch gauge.

The pressure test shall be performed first, and shall be for a period of at least 24 hours with pressure and metering charts provided to the District. The valved section of pipe under consideration shall be slowly filled with water and brought to the specified pressure by means of a pump. Before applying the specified test pressure, all air shall be expelled from the pipe.

The leakage test shall be conducted after the pressure test has been satisfactorily completed. The duration of each leakage test shall be twenty-four hours. The allowable leakage shall be as shown in the following table:

**Allowable Leakage per 1000 ft. of Pipeline*--gph**

| Avg. Test Pressure | Nominal Pipe Diameter-In. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| psi | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 |
| 450 | 0.33 | 0.44 | 0.66 | 0.88 | 1.10 | 1.32 | 1.54 | 1.76 | 1.98 | 2.20 | 2.64 | 3.30 | 3.96 |
| 400 | 0.30 | 0.40 | 0.60 | 0.80 | 1.00 | 1.20 | 1.40 | 1.60 | 1.80 | 2.00 | 2.40 | 3.00 | 3.60 |
| 350 | 0.28 | 0.37 | 0.56 | 0.74 | 0.93 | 1.11 | 1.30 | 1.48 | 1.67 | 1.85 | 2.22 | 2.78 | 3.33 |
| 300 | 0.26 | 0.34 | 0.51 | 0.68 | 0.85 | 1.02 | 1.19 | 1.36 | 1.53 | 1.70 | 2.04 | 2.55 | 3.06 |
| 275 | 0.25 | 0.33 | 0.50 | 0.66 | 0.83 | 0.99 | 1.16 | 1.32 | 1.49 | 1.65 | 1.98 | 2.48 | 2.97 |
| 250 | 0.24 | 0.32 | 0.47 | 0.63 | 0.79 | 0.95 | 1.11 | 1.26 | 1.42 | 1.58 | 1.90 | 2.37 | 2.85 |
| 225 | 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 |
| 200 | 0.21 | 0.28 | 0.42 | 0.56 | 0.70 | 0.84 | 0.98 | 1.12 | 1.26 | 1.40 | 1.68 | 2.10 | 2.52 |
| 175 | 0.20 | 0.26 | 0.39 | 0.52 | 0.65 | 0.78 | 0.91 | 1.04 | 1.17 | 1.30 | 1.56 | 1.95 | 2.34 |
| 150 | 0.18 | 0.24 | 0.36 | 0.48 | 0.60 | 0.72 | 0.84 | 0.96 | 1.08 | 1.20 | 1.44 | 1.80 | 2.16 |
| 125 | 0.17 | 0.22 | 0.33 | 0.44 | 0.55 | 0.66 | 0.77 | 0.88 | 0.99 | 1.10 | 1.32 | 1.65 | 1.98 |
| 100 | 0.15 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.20 | 1.50 | 1.80 |

**For pipe with 18 ft. nominal lengths. To obtain the recommended allowable leakage for pipe with 20 ft. nominal lengths, multiply the leakage calculated from the table by 0.9. If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.*

The District's Inspector shall observe all tests. If the pipe fails to meet test requirements, all leaks shall be repaired and defective pipe repaired or replaced by the CONTRACTOR. The test shall be repeated until satisfactory results are obtained.

The CONTRACTOR shall meter all flushing water and report quantity to the

INSPECTOR.

2.4.8 Disinfecting Water Mains

Water mains and accessories shall be disinfected in accordance with AWWA C.651. The CONTRACTOR shall have on site a set of the most recent AWWA Standards. Care shall be taken to minimize entrance of foreign material into pipe, fittings and valves. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug. The main shall be flushed prior to disinfection with sufficient flow to produce a velocity of 2.4 fps. No site for flushing shall be chosen unless it has been determined that drainage is adequate at the site.

2.4.8.1 Methods of Chlorine Application

a. Continuous Feed Method - Potable water shall be introduced into the pipe line at a constant flow rate. Chlorine shall be added at a constant rate to this flow so that the chlorine concentration in the water in the pipe is at least 50 mg/l. The chlorinated water shall remain in the pipe line at least 24 hours, after which, the chlorine concentration in the water shall be at least 25 mg/l. All valves and appurtenances shall be operated while the chlorinated water remains in the pipe line. Other methods must be approved by the District.

b. Slug Method if approved by the District - Potable water shall be introduced into the pipe line at a constant flow rate. This water shall receive a chlorine dosage which will result in a chlorine concentration of 100 mg/l in a "slug" of the water. The chlorine shall be added long enough to insure that all portions of the pipe are exposed to the 100 mg/l chlorine solution for at least 3 hours. The chlorine residual shall be checked at regular intervals not to exceed 2000 feet to insure that adequate residual is maintained. As the chlorinated water passes valves and appurtenances, they shall be operated to insure disinfection of these appurtenances.

c. Tablet Method if approved by the District - This method shall not be used if nonpotable water or foreign materials have entered the lines or if the water temperature is below 5°C (41°F).

The tablets shall be placed in each section and in all appurtenances. Enough tablets shall be used to insure that a chlorine concentration of 25 mg/l is provided in the water. They shall be attached by an adhesive to the top of the pipe sections and crushed or rubbed in all appurtenances. The adhesive shall be Permatex No. 1 or an alternative approved by the District. The velocity of the potable water in the pipe line shall be less than 1 ft./sec. The water shall then remain in contact with the pipe for 24 hours. All valves and appurtenances shall be operated while the chlorinated water is in the pipe

line. The CONTRACTOR may then proceed with adequate testing and flushing to make the line usable.

2.4.8.2 Final Flushing

Sites for flushing shall be chosen that are determined to have adequate drainage. In addition, special precautions shall be taken to prevent damage to aquatic life in receiving waters, from the heavily chlorinated waters. Flushing sites should be located as far from receiving waters as possible. Federal, state, and local regulations regarding toxic wastes must be followed. If necessary, dechlorination of the flushing water should be provided prior to discharge.

2.4.9 Bacteriological Testing

After final flushing and before the water main is placed in service, a minimum of two consecutive samples shall be collected at 24 hour intervals, for each section of pipe not exceeding 2000 feet throughout the length of pipe line. The samples shall be tested, by a laboratory chosen by the District, for bacteriologic quality and shall show the absence of coliform organisms.

2.5 Backfilling

2.5.1 Material

All backfill material shall be free from mud, refuse, construction debris, organic material, boulders, rock over 4 inches, frozen or otherwise unsuitable material. From one foot above the top of the pipe to the original ground elevation, however, material containing stones up to 8 inches in their greatest dimension may be used, unless otherwise specified. The CONTRACTOR may backfill with the excavated material provided it meets the conditions as stated above.

### 2.5.2 Initial Backfill

All trenches shall be backfilled by hand with approved material in layers not exceeding 3 inches, from the bottom of the trench to the center line of the pipe. Material shall be deposited on both sides of the pipe simultaneously and compacted into place by tamping. From the center line of the pipe to a depth of 1 foot above the pipe the trench shall be backfilled by hand or by approved mechanical methods but in either case thoroughly tamped. In no case shall any particle size be larger than 3/4" in diameter in initial backfill.

### 2.5.3 Backfilling to Grade

The remainder of backfilling shall be carried up evenly on both sides of the trench in increments of twelve inches. Each layer of earth shall be compacted into place by tamping, before the next layer is applied. Damage to pipe lines or other structures resulting from compaction shall be corrected by the CONTRACTOR.

### 2.5.4 Finished Surfaces

Uniformly smooth grading of disturbed areas shall be required after backfill and compaction. Finished surfaces shall not be more than 0.10 feet above or below the original garde or cross section. Ditches and gutters shall be finished to drain readily. In grass or lawn areas, the last four inches of compacted fill will consist of topsoil or an approved soil which will support a turf growth after fertilizing and seeding. Settlement or other damage that occurs prior to acceptance of this work shall be repaired and grades satisfactorily re-established.

### 2.5.5 Seeding

All lawn and grass areas disturbed shall be fertilized with a 5-10-5 fertilizer at the rate of 35 pounds per 1000 square feet worked in by harrow or rake at least 48 hours prior to seeding. All seed shall comply with applicable State and Federal seed laws. The seed mixture shall be a combination of rapid germinating annual grasses and perennial grasses and shall be applied at the rate of 6 pounds per 1000 square feet. Adequate rolling shall follow to compact the seeded areas.

### 2.5.6 Backfill Under Pavement

Backfilling of trenches under existing or proposed pavement shall be in layers of not more than 12 inches in thickness, and each layer shall be compacted to a minimum of 95 percent density as compared to density of the same material when tested in accordance with AASHO Specification T-99. Compaction shall be by pneumatic tampers of other approved methods. Compaction by water will not be permitted under pavement. All material under the pavement shall consist of aggregate base material meeting the requirements of Kentucky Department of Highways, Standard Specifications for Road and Bridge Construction, latest edition. This material shall be thoroughly and uniformly tamped with pneumatic tampers or other approved methods. Moisture content shall be within 20 percent of optimum. All moisture-density tests required by Mountain Water District shall be performed by Laboratories approved by the District and the CONTRACTOR shall bear the costs of all testing. The CONTRACTOR will be responsible for and shall repair any settlement in the backfill or pavement for a period of one year after completion of the work.

### 2.5.7 Replacement of Pavement and Structures

The CONTRACTOR shall restore all pavement, sidewalks, curbing, gutters, shrubbery, fences, poles, or other property and surface removed or disturbed as a part of the work to a condition equal to or better than before the work began.

### 2.5.8 Clean Up

All surplus materials, tools, temporary structures, dirt, rubbish, rock and excess earth from the excavation shall be removed at the completion of construction and the site left in a clean condition.

### 2.5.9 Sediment Control

The CONTRACTOR will be responsible for control of siltation and erosion from the Project within the Project limits. Control shall include all necessary measures to minimize the deposition of materials in downstream areas.

# TECHNICAL SPECIFICATIONS

## SECTION III

## MATERIAL

### 3.1 Pipe

Water mains and lateral pipe shall be one of the following materials, at the CONTRACTOR'S option, except where otherwise indicated. The CONTRACTOR shall indicate at the time of bidding the type of pipe to be installed.

#### 3.1.1 Ductile Iron Pipe

Of Grade 60-42-10, centrifugally cast in accordance with ANSI/AWWA C151/A21.51-91 shall be used. Pipe class shall be as indicated on the drawings, and minimum wall thickness shall be according to ANSI/AWWA C150/A21.50-91. Pipe shall be in nominal 16', 18' or 20' lengths.

#### 3.1.2 PVC Pipe

Polyvinyl Chloride Pipe, Fittings and Joints: PVC water pipe shall conform, at a minimum, to ASTM Specifications D-2241, and shall be pressure class 250. The pipe furnished under ASTM A-2441 shall have a standard dimension ratio of SDR 17 or lower, and shall be rated to a working pressure of at least 250 psi at 73.4°F. In no case shall PVC pipe be utilized in a situation that will subject the pipe to greater than 50% of the rated working pressure of the pipe. In such cases, ductile iron shall be utilized.

### 3.2 Joints and Joining

#### 3.2.1 Ductile Iron Pipe

Joints shall be mechanical or slip-on as "Bell-Tite", "Tyton", "Grip-Tite", or approved equal, unless otherwise indicated. Joint assembly shall be installed according to the manufacturer's directions and shall comply with ANSI/AWWA C111/A21.11-90.

#### 3.2.2 PVC Joints

Joints shall be of the push-on type conforming to ASTM D3139 and F477

requirements for elastometric-gasket joints. All jointing material and lubricants shall be non-toxic.

### 3.2.3 Restrained Joints

Provided that a schedule is submitted to the ENGINEER for approval, showing the location and length of pipe run where proposed for use, the CONTRACTOR shall have the option of using US Pipe "Field-Loc", Megha 1400 or approved equal joint. Assembly, including allowed deflection, shall be strictly as recommended by the manufacturer. Concrete anchorage shown on the drawings will not be required where such joints are approved for use.

## 3.3 Fittings

### 3.3.1 Ductile Iron Fittings

Fittings of Grade 70-50-05 per ASTM A536, shall be of the same type and pressure-class as the pipe, except that cast iron fittings of the same general pressure class may be used. Ductile-Iron fittings shall comply with ANSI/AWWA C110/A21.10-93.

### 3.3.2 PVC Fittings

Fittings shall be ductile iron Mechanical Joint Class 250 conforming to AWWA Specifications C110 for short body ductile iron fittings. Fittings shall be tar-coated outside, and shall receive the standard cement lining with bituminous seal coat on the inside as specified for the ductile iron pipe.

## 3.4 Protective Coating

Ductile iron pipe and fittings shall be cement lined in accordance with ANSI/AWWA C104/A21.4-90 except that the lining shall be half thickness, commonly referred to as "enameling", allowed by an interior coat of coal tar enamel. Underground pipe, fittings and accessories, and piping in casings shall have an exterior coat of coal tar enamel.

## 3.5 Service Connections

used. Only one service will be permitted per line.

3.5.2 Corporation Stop

Corporation stops shall be Ford F-1000-3 or approved equal with inlet threads conforming to AWWA C800-66 commonly known as the Mueller thread, and CTS-Pack joint fitting or connection.

3.5.3 Curb Stop

All services exceeding ¾" diameter or 50' in length and all stream crossings shall have curb stop. Curb stops shall have copper inlet and copper outlet, similar to the Ford model #B44-333, B44-444 or approved equal.

3.5.4 All service connections shall be "wet-tapped" with main line at normal operating pressures. No exceptions taken. Detail Sheet MW-8 depicts a Typical Service Connector.

## 3.6 Gate Valves

Gate valves shall be ductile cast iron, bronze mounted, resilient-seated, fusion bonded epoxy coating inside and out, with brass or bronze non-rizing stems complying with AWWA C509-87. Working pressure shall be at least equal to that of the pipe with which used. Valves shall open left or counter-clockwise. Valves shall be as manufactured by US Pipe model Metro seal 250, Mueller model A-2360 or approved equal.

## 3.7 Valve Boxes

Valve boxes shall be adjustable cast iron valve boxes of suitable diameter, length, and design shall be furnished and installed for all buried valves. Boxes shall be as the Buffalo Type No. H, 10380 by Mueller, F-2450 by Clow, B-3102 by M & H, or approved equal.

## 3.8 Hydrants

Fire hydrants shall be traffic type with safety flange protection conforming to AWWA C502-85 and shall have not less than 6 inch inside diameter barrel, 5 inch minimum hydrant valve and a capacity of not less than 1000 gpm with a loss of not more than 2.5 psi through the hydrant. Hydrants shall have a 6 inch mechanical joint connection to the water main; two 2.5 inch hose outlets; and one 4 inch pumper outlet, and be so designed that if broken off, the hydrant valve will remain closed. Direction of opening shall be left (counter-clockwise) and nozzle threadings shall be National Standard. Hydrants shall be a Mueller A24015 or an approved equal hydrant.

inch pumper outlet, and be so designed that if broken off, the hydrant valve will remain closed. Direction of opening shall be left (counter-clockwise) and nozzle threadings shall be National Standard. Hydrants shall be a Mueller A24015 or an approved equal hydrant.

### 3.9 Concrete

Concrete shall develop 2450 psi and 3500 psi compressive strength at 7 and 28 days, respectively, and be measured, mixed and placed according to the American Concrete Institute Standard Recommended Practice for these operations (ACI 614). Cement shall conform to ASTM C150 for Type I or III. Fine and coarse aggregates shall conform to ASTM C-33. Mixing water shall be clean and free from injurious quantities of oil, acid, alkali or other deleterious substances. Concrete shall be placed with the minimum suitable slope for the particular pour. An air entraining admixture, subject to the ENGINEER'S approval, shall be added to concrete at the mixer, unless air entraining cement is used or unless otherwise indicated in amount sufficient to entrain the percentages of air designated in the following table. Indicated air percentages shall be present at the time when concrete is placed in the forms.

| Maximum Aggregate Size | Percent of Air |
|---|---|
| 1-1/2", 2", or 2-1/2" | 4% + or - 1% |
| 3/4" or 1" | 5% + or - 1% |
| 3/8" or 1/2" | 6% + or - 1% |

Ready mixed concrete shall be mixed and delivered in compliance with ASTM C-94.

### 3.10 Casing Pipe

Casing pipe shall conform to the Materials Standards of ASTM Designation A-139 Grade B or approved equal. Only new prime pipe will be permitted. Casing pipe shall be 4" larger than the largest outside diameter of the carrier pipe.

When casing pipe is required for highways or railroad crossings, the project shall be completed in accordance with applicable federal, state, and local regulations. In the case of railroad crossings, the project should comply further with regulations established by the railroad company. In general, boring will be permitted for casing diameters through 36 in., with maximum length of about 175 ft.; jacking for diameters 30 in. through 60 in., with lengths of about 200 ft.; and tunneling for pipes 48 in. and larger for longer lengths.

### 3.11 Tapping Saddles

All connections to PVC pipe, including service connections, shall be made with approved Ford model S-70 tapping saddle or an approved equal for PVC or Ford model #F202 for ductile iron or approved equal.

### 3.12 Carrier Pipe

Carrier pipe shall be ductile iron pipe meeting the specifications as outlined in Section 2.3.1.1.

Carrier pipe may be pushed or pulled through the completed casing pipe. Casing spacers should be placed on the carrier pipe to ensure approximate centering within the casing pipe and to prevent damage during installation. Care must be exercised in order to avoid metal-to-metal contact. In order to avoid the transfer of earth and live loads to the carrier pipe, the space between the carrier and casing pipes should not be filled completely. Casing shall be sealed with a rubber boot type seal.

Starting today (04-08-2022) Mountain Water District will not allow a subcontractor to be utilized on any construction project for the District. The District may make an exception to this enforcement based on necessity or size of the project; however, the request shall be in writing to the District with an explanation of the reason for a subcontractor by the engineering firm awarded the project. Any waterline installed deeper than 7' shall be requested in writing as well, with an explanation of the reason for the depth by the engineering firm awarded the project. The engineer shall contact the District in writing or via email three days prior to any connections or tie-ins so the District can schedule staff to be on site there for any emergency. All engineers please apply this to your technical specifications for all of Mountain Water District's construction projects.

It is strongly recommended by the Mountain Water District that a site meeting in the field be done prior to bidding the project and startup for construction to resolve any questions or issues in order to avoid this kind of problem in the future.

It's the District's opinion that the ratepayers of the Mountain Water District as well as the taxpayers of the Department of the Highways shouldn't pay additional cost for a contractor to profit off of a subcontractor. Our ratepayers and taxpayers shouldn't endure the financial pain of being burdened with such issues.

If any of you have any questions, or if I can be of further assistance in this matter, please feel free to contact me. If any engineering firm, contractor, or agency was mistakenly left out of this email please let me know so I may contact them as well.

As per Roy Sawyers email dated 04-08-2022.

# Kentucky Transportation Cabinet

# Highway District 12

# And

# _____(2), Construction

# Kentucky Pollutant Discharge Elimination System Permit KYR10 Best Management Practices (BMP) plan

# Groundwater protection plan

# For Highway Construction Activities

# For

# KY 199 Spot Improvement; Relocate Portions of KY 199 Along Old Norfolk Southern Railroad Bed.

## Project: PCN ## - ####

## SYP Item Number: 12-298.40

KyTC BMP Plan for Project PCN ## - ####

# Project information

Note – (1) = Design (2) = Construction (3) = Contractor

1. Owner – Kentucky Transportation Cabinet, District 12

2. Resident Engineer: Paxton Weddington

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 (Address)
   1355 Pond Creek Road
   Stone, KY 41567

6. Latitude/Longitude (project mid-point)
   37.585833, -82.270833

7. County (project mid-point) Pike

8. Project start date (date work will begin):

9. Projected completion date: (2)

KyTC BMP Plan for Project PCN ## - ####

# A. Site description:

1. Nature of Construction Activity (from letting project description) KY 199 Spot Improvement; Relocate Portions of KY 199 Along Old Norfolk Southern Railroad Bed.

2. Order of major soil disturbing activities (2) and (3)

3. Projected volume of material to be moved
   55,640 cy

4. Estimate of total project area (acres)
   15.3 acres (Perm ROW and Easements)

5. Estimate of area to be disturbed (acres)
   15.3 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. No additional data.

7. Data describing existing soil condition No additional data

8. Data describing existing discharge water quality (if any) No additional data

9. Receiving water name
   Pond Creek of Tug Fork of Big Sandy River

10. TMDLs and Pollutants of Concern in Receiving Waters: (1 DEA)

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)

# 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. <u>All DDA’s will have adequate BMP’s in place before being disturbed.</u>

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.
- 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.
  - 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 : None

## 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:**

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.

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 contract with a hazardous substance.
- 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. None

## 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. None

## F. Inspections

Inspection and maintenance practices that will be used to maintain erosion and sediment controls:

- 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 form cleaning concrete trucks and equipment.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
- 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 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.

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.)

# KyTC BMP Plan for Project PCN ## - ####

## Contractor and Resident Engineer Plan certification

The contractor that is responsible for implementing this BMP plan is identified in the Project Information section of this plan.

The following certification applies to all parties that are signatory to this BMP plan:

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 gathered and evaluated 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. Further, this plan complies with the requirements of 401 KAR 5:037. By this certification, the undersigned state that the individuals signing the plan have reviewed the terms of the plan and will implement its provisions as they pertain to ground water protection.

Resident Engineer and Contractor Certification:

(2) Resident Engineer signature

Signed _____title_____, _____
Typed or printed name[2] signature

(3) Signed _____title_____, _____
Typed or printed name[1] signature

1. Contractors Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.

2. KyTC note: to be signed by the Chief District Engineer or a person designated to have the authority to sign reports by such a person (usually the resident engineer) in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601 Reference the Project Control Number (PCN) and KPDES number when one has been issued.

# Sub-Contractor Certification

The following sub-contractor shall be made aware of the BMP plan and responsible for implementation of BMPs identified in this plan as follows:

Subcontractor

Name:
Address:
Address:

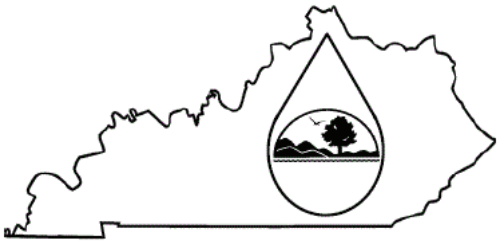
Phone:

The part of BMP plan this subcontractor is responsible to implement is:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System permit that authorizes the storm water discharges, the BMP plan that has been developed to manage the quality of water to be discharged as a result of storm events associated with the construction site activity and management of non-storm water pollutant sources identified as part of this certification.

Signed _____title_____, _____
Typed or printed name[1] signature

1. Sub Contractor Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.



# KENTUCKY POLLUTION DISCHARGE ELIMINATION SYSTEM (KPDES)

Notice of Intent (NOI) for coverage of Storm Water Discharge Associated with Construction Activities Under the KPDES Storm Water General Permit KYR100000

Click here for Instructions
(Controls/KPDES_FormKYR10_Instructions.htm)

Click here to obtain information and a copy of the KPDES General Permit.
(http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf)

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

| Reason for Submittal:(*) | Agency Interest ID: | Permit Number:(✓) |
|---|---|---|
| Application for New Permit Coverage | Agency Interest ID | KPDES Permit Number |

If change to existing permit coverage is requested, describe the changes for which modification of coverage is being sought:(✓)

ELIGIBILITY:
Stormwater discharges associated with construction activities disturbing individually one (1) acre or more, including, in the case of a common plan of development, contiguous construction activities that cumulatively equal one (1) acre or more of disturbance.

EXCLUSIONS:
The following are excluded from coverage under this general permit:
1) Are conducted at or on properties that have obtained an individual KPDES permit for the discharge of other wastewaters which requires the development and implementation of a Best Management Practices (BMP) plan;
2) Any operation that the DOW determines an individual permit would better address the discharges from that operation;
3) Any project that discharges to an Impaired Water listed in the most recent Integrated Report, §305(b) as impaired for sediment and for which an approved TMDL has been developed.

SECTION I -- FACILITY OPERATOR INFORMATION (PERMITTEE)

| Company Name:(✓) | First Name:(✓) | M.I.: | Last Name:(✓) |
|---|---|---|---|
| KYTC District 12 | Mary | W | Holbrook |

| Mailing Address:(*) | City:(*) | State:(*) | Zip:(*) |
|---|---|---|---|
| 109 Loraine Street | Pikeville | Kentucky | 41501 |

| eMail Address:(*) | Business Phone:(*) | Alternate Phone: |
|---|---|---|
| MaryW.Holbrook@ky.gov | 606-433-7791 | Phone |

SECTION II -- GENERAL SITE LOCATION INFORMATION

| Project Name:(*) | Status of Owner/Operator(*) | SIC Code(*) |
|---|---|---|
| PCN ##-####, SYP Item Number: 12-298.40 | State Government | 1611 Highway and Street Cons |

| Company Name:(✓) | First Name:(✓) | M.I.: | Last Name:(✓) |
|---|---|---|---|
| KYTC District 12 | Mary | W | Holbrook |

Site Physical Address:(*)
1355 Pond Creek Road

| City:(*) | State:(*) | Zip:(*) |
|---|---|---|
| Stone | Kentucky | 41567 |

| County:(*) | Latitude(decimal degrees)(*)DMS to DD Converter (https://www.fcc.gov/media/radio/dms-decimal) | Longitude(decimal degrees)(*) |
|---|---|---|
| Pike | 37.585833 | -82.270833 |

SECTION III -- SPECIFIC SITE ACTIVITY INFORMATION

Project Description:(*)
KY 199 Spot Improvement.

a. For single projects provide the following information

| Total Number of Acres in Project:(✓) | Total Number of Acres Disturbed:(✓) |
|---|---|
| 15.3 | 15.3 |
| Anticipated Start Date:(✓) | Anticipated Completion Date:(✓) |
| | |

b. For common plans of development provide the following information

| Total Number of Acres in Project:(✓) | Total Number of Acres Disturbed:(✓) |
|---|---|
| # Acre(s) | # Acre(s) |
| Number of individual lots in development, if applicable:(✓) | Number of lots in development:(✓) |
| # lot(s) | # lot(s) |
| Total acreage of lots intended to be developed:(✓) | Number of acres intended to be disturbed at any one time:(✓) |
| Project Acres | Disturbed Acres |
| Anticipated Start Date:(✓) | Anticipated Completion Date:(✓) |
| | |

List Building Contractor(s) at the time of Application:(*)

| | Company Name | |
|---|---|---|
| + | | |

SECTION IV -- IF THE PERMITTED SITE DISCHARGES TO A WATER BODY THE FOLLOWING INFORMATION IS REQUIRED

Discharge Point(s):

| | Unnamed Tributary? | Latitude | Longitude | Receiving Water Name | |
|---|---|---|---|---|---|
| 1 | No | 37.578333 | -82.269167 | Pond Creek | Delete |
| 2 | No | 37.595833 | -82.269167 | Pond Creek | Delete |
| 3 | No | 37.581111 | -82.270556 | Pond Creek | Delete |
| 4 | No | 37.583056 | -82.271111 | Pond Creek | Delete |
| 5 | No | 37.585758 | -82.271086 | Pond Creek | Delete |
| 6 | No | 37.586389 | -82.271039 | Pond Creek | Delete |
| 7 | No | 37.587064 | -82.270961 | Pond Creek | Delete |
| 8 | No | 37.589339 | -82.268286 | Pond Creek | Delete |
| 9 | No | 37.589703 | -82.268194 | Pond Creek | Delete |
| 10 | No | 37.591081 | -82.269372 | Pond Creek | Delete |

SECTION V -- IF THE PERMITTED SITE DISCHARGES TO A MS4 THE FOLLOWING INFORMATION IS REQUIRED

Name of MS4:

| Date of application/notification to the MS4 for construction site permit coverage: | Discharge Point(s):(*) |
|---|---|
| Date | |

| | Latitude | Longitude | |
|---|---|---|---|
| + | | | |

SECTION VI -- WILL THE PROJECT REQUIRE CONSTRUCTION ACTIVITIES IN A WATER BODY OR THE RIPARIAN ZONE?

| Will the project require construction activities in a water body or the riparian zone?: (*) | Yes |
|---|---|
| If Yes, describe scope of activity: (✓) | Impacts associated with relocating and improving portions of KY 199. |
| Is a Clean Water Act 404 permit required?:(*) | Yes |

| | |
|---|---|
| Is a Clean Water Act 401 Water Quality Certification required?:(*) | Yes |

SECTION VII -- NOI PREPARER INFORMATION

| First Name:(*) | M.I.: | Last Name:(*) | Company Name:(*) |
|---|---|---|---|
| John | M | Johnson | KYTC District 12 |

| Mailing Address:(*) | City:(*) | State:(*) | Zip:(*) |
|---|---|---|---|
| 109 Loraine Street | Pikeville | Kentucky | 41501 |

| eMail Address:(*) | Business Phone:(*) | Alternate Phone: |
|---|---|---|
| JohnM.Johnson@ky.gov | 606-433-7791 | Phone |

SECTION VIII -- ATTACHMENTS

| | |
|---|---|
| Facility Location Map:(*) | Upload file |
| Supplemental Information: | Upload file |

SECTION IX -- CERTIFICATION

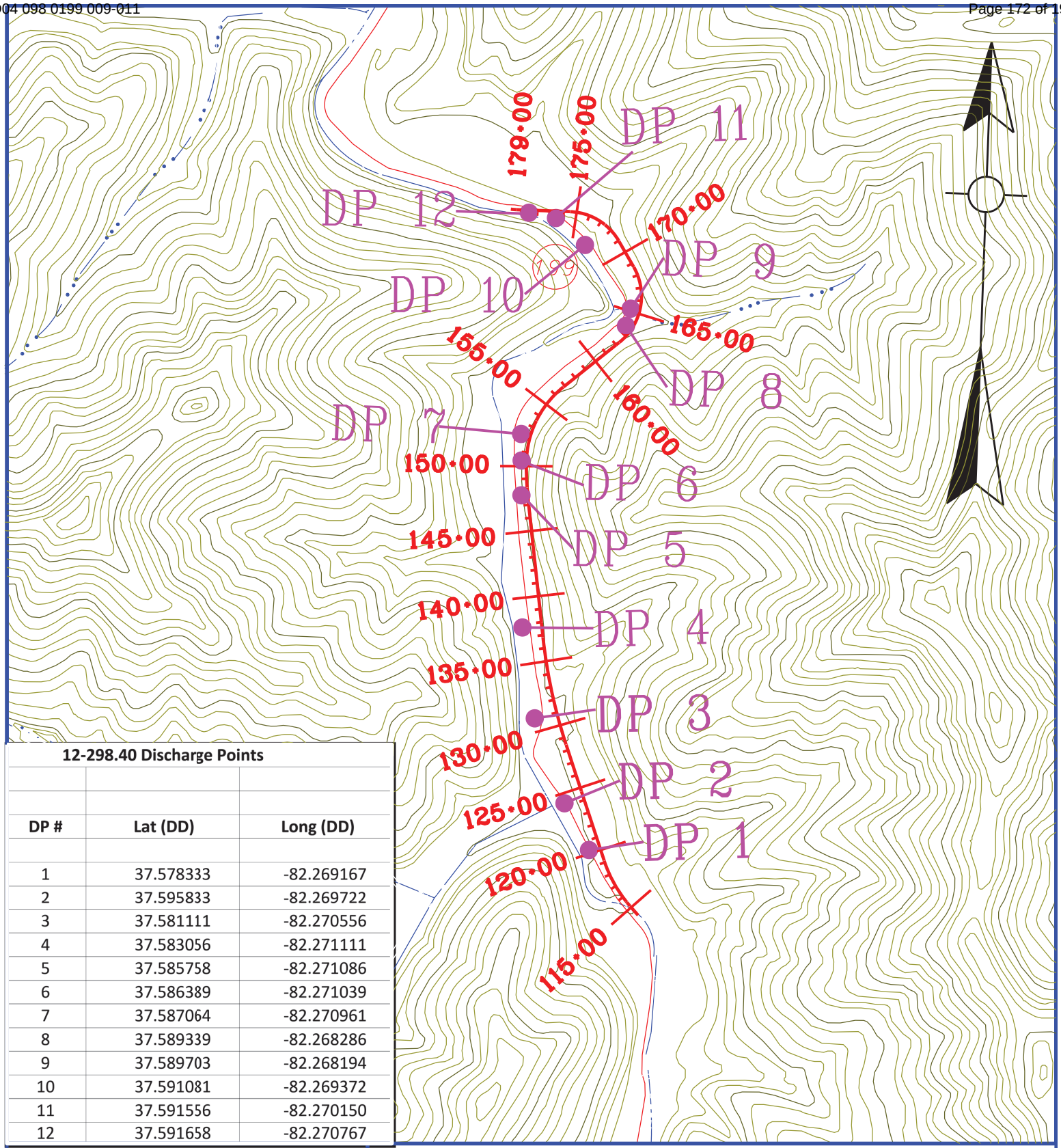
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information 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.

| Signature:(*) | Title:(*) |
|---|---|
| Mary W. Holbrook | Chief District Engineer |

| First Name:(*) | M.I.: | Last Name:(*) |
|---|---|---|
| Mary | W | Holbrook |

| eMail Address:(*) | Business Phone:(*) | Alternate Phone: | Signature Date:(*) |
|---|---|---|---|
| MaryW.Holbrook@ky.gov | 606-433-7791 | Phone | Date |

Click to Save Values for Future Retrieval | Click to Submit to EEC

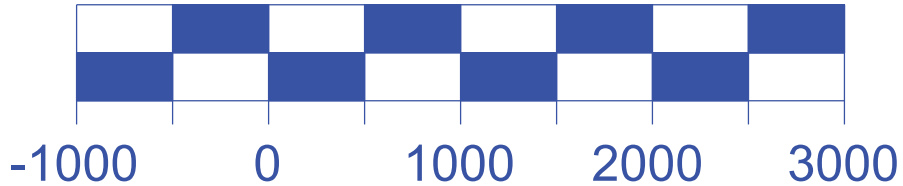



**12-298.40 Discharge Points**

| DP # | Lat (DD) | Long (DD) |
|---|---|---|
| 1 | 37.578333 | -82.269167 |
| 2 | 37.595833 | -82.269722 |
| 3 | 37.581111 | -82.270556 |
| 4 | 37.583056 | -82.271111 |
| 5 | 37.585758 | -82.271086 |
| 6 | 37.586389 | -82.271039 |
| 7 | 37.587064 | -82.270961 |
| 8 | 37.589339 | -82.268286 |
| 9 | 37.589703 | -82.268194 |
| 10 | 37.591081 | -82.269372 |
| 11 | 37.591556 | -82.270150 |
| 12 | 37.591658 | -82.270767 |

## Point Discharge Map

KY 199 at Stone
Pike County, KY
Item # 12-298.40
Scale: 1" = 2000'



# *SPECIAL NOTE*

## Filing of eNOI for KPDES Construction Stormwater Permit

**County: Pike** **Route: KY 199**
**Item No.: 12-298.40** **KDOW Submittal ID:**
**Project Description: KY 199 Spot Improvement; Relocate portions of KY 199 along old Norfolk Southern Railroad Bed.**

**A Notice of Intent for obtaining coverage under the Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Stormwater Discharges Associated with Construction Activities (KYR10) has been drafted, copy of which is attached. Upon award, the Contractor will be identified in Section III of the form as the "Building Contractor" and it will be submitted for approval to the Kentucky Division of Water. The Contractor shall be responsible for advancing the work in a manner that is compliant with all applicable and appropriate KYTC specifications for sediment and erosion control as well as meeting the requirements of the KYR10 permit and the KDOW.**

**If there are any questions regarding this note, please contact Danny Peake, Director, Division of Environmental Analysis, TCOB, 200 Mero Street, Frankfort, KY 40622, Phone: (502) 564-7250.**

# PART II

# SPECIFICATIONS AND STANDARD DRAWINGS

## SPECIFICATIONS REFERENCE

Any reference in the plans or proposal to previous editions of the *Standard Specifications for Road and Bridge Construction* and *Standard Drawings* are superseded by *Standard Specifications for Road and Bridge Construction, Edition of 2019* and *Standard Drawings, Edition of 2020.*

# SUPPLEMENTAL SPECIFICATIONS

The contractor shall use the Supplemental Specifications that are effective at the time of letting. The Supplemental Specifications can be found at the following link:

http://transportation.ky.gov/Construction/Pages/Kentucky-Standard-Specifications.aspx

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## SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

This Special Note will apply when indicated on the plans or in the proposal.

**1.0 DESCRIPTION.** Furnish, install, operate, and maintain variable message signs at the locations shown on the plans or designated by the Engineer. Remove and retain possession of variable message signs when they are no longer needed on the project.

**2.0 MATERIALS.**

**2.1 General.** Use LED Variable Message Signs Class I, II, or III, as appropriate, from the Department's List of Approved Materials.

Unclassified signs may be submitted for approval by the Engineer. The Engineer may require a daytime and nighttime demonstration. The Engineer will make a final decision within 30 days after all required information is received.

**2.2 Sign and Controls.** All signs must:

1) Provide 3-line messages with each line being 8 characters long and at least 18 inches tall. Each character comprises 35 pixels.
2) Provide at least 40 preprogrammed messages available for use at any time. Provide for quick and easy change of the displayed message; editing of the message; and additions of new messages.
3) Provide a controller consisting of:
   a) Keyboard or keypad.
   b) Readout that mimics the actual sign display. (When LCD or LCD type readout is used, include backlighting and heating or otherwise arrange for viewing in cold temperatures.)
   c) Non-volatile memory or suitable memory with battery backup for storing pre-programmed messages.
   d) Logic circuitry to control the sequence of messages and flash rate.
4) Provide a serial interface that is capable of supporting complete remote control ability through land line and cellular telephone operation. Include communication software capable of immediately updating the message, providing complete sign status, and allowing message library queries and updates.
5) Allow a single person easily to raise the sign to a satisfactory height above the pavement during use, and lower the sign during travel.
6) Be Highway Orange on all exterior surfaces of the trailer, supports, and controller cabinet.
7) Provide operation in ambient temperatures from -30 to + 120 degrees Fahrenheit during snow, rain and other inclement weather.
8) Provide the driver board as part of a module. All modules are interchangeable, and have plug and socket arrangements for disconnection and reconnection. Printed circuit boards associated with driver boards have a conformable coating to protect against moisture.
9) Provide a sign case sealed against rain, snow, dust, insects, etc. The lens is UV stabilized clear plastic (polycarbonate, acrylic, or other approved material) angled to prevent glare.
10) Provide a flat black UV protected coating on the sign hardware, character PCB, and appropriate lens areas.
11) Provide a photocell control to provide automatic dimming.

1I

12) Allow an on-off flashing sequence at an adjustable rate.
13) Provide a sight to aim the message.
14) Provide a LED display color of approximately 590 nm amber.
15) Provide a controller that is password protected.
16) Provide a security device that prevents unauthorized individuals from accessing the controller.
17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

/KEEP/RIGHT/⇒⇒⇒/
/KEEP/LEFT/⇐⇐⇐/
/LOOSE/GRAVEL/AHEAD/
/RD WORK/NEXT/**MILES/
/TWO WAY/TRAFFIC/AHEAD/
/PAINT/CREW/AHEAD/
/REDUCE/SPEED/**MPH/
/BRIDGE/WORK/***0 FT/
/MAX/SPEED/**MPH/
/SURVEY/PARTY/AHEAD/
/MIN/SPEED/**MPH/
/ICY/BRIDGE/AHEAD/ /ONE LANE/BRIDGE/AHEAD/
/ROUGH/ROAD/AHEAD/
/MERGING/TRAFFIC/AHEAD/
/NEXT/***/MILES/
/HEAVY/TRAFFIC/AHEAD/
/SPEED/LIMIT/**MPH/
/BUMP/AHEAD/
/TWO/WAY/TRAFFIC/

*Insert numerals as directed by the Engineer.
Add other messages during the project when required by the Engineer.

**2.3 Power.**

1) Design solar panels to yield 10 percent or greater additional charge than sign consumption. Provide direct wiring for operation of the sign or arrow board from an external power source to provide energy backup for 21 days without sunlight and an on-board system charger with the ability to recharge completely discharged batteries in 24 hours.

**3.0 CONSTRUCTION.** Furnish and operate the variable message signs as designated on the plans or by the Engineer. Ensure the bottom of the message panel is a minimum of 7 feet above the roadway in urban areas and 5 feet above in rural areas when operating. Use Class I, II, or III signs on roads with a speed limit less than 55 mph. Use Class I or II signs on roads with speed limits 55 mph or greater.

Maintain the sign in proper working order, including repair of any damage done by others, until completion of the project. When the sign becomes inoperative, immediately repair or replace the sign. Repetitive problems with the same unit will be cause for rejection and replacement.

Use only project related messages and messages directed by the Engineer, unnecessary messages lessen the impact of the sign. Ensure the message is displayed in either one or 2 phases with each phase having no more than 3 lines of text. When no message is needed, but it is necessary to know if the sign is operable, flash only a pixel.

When the sign is not needed, move it outside the clear zone or where the Engineer directs. Variable Message Signs are the property of the Contractor and shall be removed from the project when no longer needed. The Department will not assume ownership of these signs.

**4.0 MEASUREMENT.** The final quantity of Variable Message Sign will be

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the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

**5.0 PAYMENT.** The Department will pay for the Variable Message Signs at the unit price each. The Department will not pay for signs replaced due to damage or rejection. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to, operate, move, repair, and maintain or replace the variable message signs. The Department will make payment for the completed and accepted quantities under the following:

| Code | Pay Item | Pay Unit |
|---|---|---|
| 02671 | Portable Changeable Message Sign | Each |

Effective June 15, 2012

11N

# SPECIAL NOTE FOR LONGITUDINAL PAVEMENT JOINT ADHESIVE

1. DESCRIPTION. This specification covers the requirements and practices for applying an asphalt adhesive material to the longitudinal joint of the surface course of an asphalt pavement. Apply the adhesive to the face of longitudinal joint between driving lanes for the first lane paved. Then, place and compact the adjacent lane against the treated face to produce a strong, durable, waterproof longitudinal joint.

2. MATERIALS, EQUIPMENT, AND PERSONNEL.

2.1 Joint Adhesive. Provide material conforming to Subsection 2.1.1.

2.1.1 Provide an adhesive conforming to the following requirements:

| Property | Specification | Test Procedure |
|---|---|---|
| Viscosity, 400 ° F (Pa·s) | 4.0 – 10.0 | ASTM D 4402 |
| Cone Penetration, 77 ° F | 60 – 100 | ASTM D 5329 |
| Flow, 140 ° F (mm) | 5.0 max. | ASTM D 5329 |
| Resilience, 77 ° F (%) | 30 min. | ASTM D 5329 |
| Ductility, 77 ° F (cm) | 30.0 min. | ASTM D 113 |
| Ductility, 39 ° F (cm) | 30.0 min. | ASTM D 113 |
| Tensile Adhesion, 77 ° F (%) | 500 min. | ASTM D 5329, Type II |
| Softening Point, ° F | 171 min. | AASHTO T 53 |
| Asphalt Compatibility | Pass | ASTM D 5329 |

Ensure the temperature of the pavement joint adhesive is between 380 and 410 °F when the material is extruded in a 0.125-inch-thick band over the entire face of the longitudinal joint.

2.2. Equipment.

2.2.1 Melter Kettle. Provide an oil-jacketed, double-boiler, melter kettle equipped with any needed agitation and recirculating systems.

2.2.2 Applicator System. Provide a pressure-feed-wand applicator system with an applicator shoe attached.

2.3 Personnel. Ensure a technical representative from the manufacturer of the pavement joint adhesive is present during the initial construction activities and available upon the request of the Engineer.

3. CONSTRUCTION.

3.1 Surface Preparation. Prior to the application of the pavement joint adhesive, ensure the face of the longitudinal joint is thoroughly dry and free from dust or any other debris that would inhibit adhesion. Clean the joint face by the use of compressed air.

11N

Ensure this preparation process occurs shortly before application to prevent the return of debris on the joint face.

3.2 Pavement Joint Adhesive Application. Ensure the ambient temperature is a minimum of 40 $^{o}$ F during the application of the pavement joint adhesive. Prior to applying the adhesive, demonstrate competence in applying the adhesive according to this note to the satisfaction of the Engineer. Heat the adhesive in the melter kettle to the specified temperature range. Pump the adhesive from the melter kettle through the wand onto the vertical face of the cold joint. Apply the adhesive in a continuous band over the entire face of the longitudinal joint. Do not use excessive material in either thickness or location. Ensure the edge of the extruded adhesive material is flush with the surface of the pavement. Then, place and compact the adjacent lane against the joint face. Remove any excessive material extruded from the joint after compaction (a small line of material may remain).

3.3 Pavement Joint Adhesive Certification. Furnish the joint adhesive's certification to the Engineer stating the material conforms to all requirements herein prior to use.

3.4 Sampling and Testing. The Department will require a random sample of pavement joint adhesive from each manufacturer's lot of material. Extrude two 5 lb. samples of the heated material and forward the sample to the Division of Materials for testing. Reynolds oven bags, turkey size, placed inside small cardboard boxes or cement cylinder molds have been found suitable. Ensure the product temperature is 400°F or below at the time of sampling.

4. MEASUREMENT. The Department will measure the quantity of Pavement Joint Adhesive in linear feet. The Department will not measure for payment any extra materials, labor, methods, equipment, or construction techniques used to satisfy the requirements of this note. The Department will not measure for payment any trial applications of Pavement Joint Adhesive, the cleaning of the joint face, or furnishing and placing the adhesive. The Department will consider all such items incidental to the Pavement Joint Adhesive.

5. PAYMENT. The Department will pay for the Pavement Joint Adhesive at the Contract unit bid price and apply an adjustment for each manufacturer's lot of material based on the degree of compliance as defined in the following schedule. When a sample fails on two or more tests, the Department may add the deductions, but the total deduction will not exceed 100 percent.

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| Pavement Joint Adhesive Price Adjustment Schedule | | | | | | |
|---|---|---|---|---|---|---|
| Test | Specification | 100% Pay | 90% Pay | 80% Pay | 50% Pay | 0% Pay |
| Joint Adhesive Referenced in Subsection 2.1.1 | | | | | | |
| Viscosity, 400 ° F (Pa•s) | | | 3.0-3.4 | 2.5-2.9 | 2.0-2.4 | ≤1.9 |
| ASTM D 3236 | 4.0-10.0 | 3.5-10.5 | 10.6-11.0 | 11.1-11.5 | 11.6-12.0 | ≥ 12.1 |
| Cone Penetration, 77 ° F | | | 54-56 | 51-53 | 48-50 | ≤ 47 |
| ASTM D 5329 | 60-100 | 57-103 | 104-106 | 107-109 | 110-112 | ≥ 113 |
| Flow, 140 ° F (mm) ASTM D 5329 | ≤ 5.0 | ≤ 5.5 | 5.6-6.0 | 6.1-6.5 | 6.6-7.0 | ≥ 7.1 |
| Resilience, 77 ° F (%) ASTM D 5329 | ≥ 30 | ≥ 28 | 26-27 | 24-25 | 22-23 | ≤ 21 |
| Tensile Adhesion, 77 ° F (%) ASTM D 5329 | ≥ 500 | ≥ 490 | 480-489 | 470-479 | 460-469 | ≤ 459 |
| Softening Point, ° F AASHTO T 53 | ≥ 171 | ≥ 169 | 166-168 | 163-165 | 160-162 | ≤ 159 |
| Ductility, 77 ° F (cm) ASTM D 113 | ≥ 30.0 | ≥ 29.0 | 28.0-28.9 | 27.0-27.9 | 26.0-26.9 | ≤ 25.9 |
| Ductility, 39 ° F (cm) ASTM D 113 | ≥ 30.0 | ≥ 29.0 | 28.0-28.9 | 27.0-27.9 | 26.0-26.9 | ≤ 25.9 |

| Code | Pay Item | Pay Unit |
|---|---|---|
| 20071EC | Joint Adhesive | Linear Foot |

May 7, 2014

# 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

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 (forty and above); 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 forty (40) and over. 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, or age forty (40) and over, or because the person is a qualified individual with a disability, except that such a notice or advertisement may indicate a preference, limitation, or specification based on religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, when religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, 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 forty (40) and over, 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 administrating agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

Revised: January 25, 2017

# 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 (7) provides:

No present or former public servant shall, within six (6) months 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, or is regulated by, the state in matters in which he was directly involved during the last thirty-six (36) months of 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, or for which he received, prior to his state employment, a professional degree or license, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved during the last thirty-six (36) months of his tenure 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, nor shall it prohibit the former officer or public servant from receiving public funds disbursed through entitlement programs.

KRS 11A.040 (9) states:

A former public servant shall not represent a person or business before a state agency in a matter in which the former public servant was directly involved during the last thirty-six (36) months of his tenure, 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, 1025 Capital Center Drive, Suite 104, Frankfort, Kentucky 40601; telephone (502) 564-7954.

Revised: May 23, 2022

## 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.

# EMPLOYEE RIGHTS
## UNDER THE FAIR LABOR STANDARDS ACT

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

## FEDERAL MINIMUM WAGE
# $7.25 PER HOUR
**BEGINNING JULY 24, 2009**

**OVERTIME PAY**

At least 1½ times your regular rate of pay for all hours worked over 40 in a workweek.

**CHILD LABOR**

An employee must be at least **16** years old to work in most non-farm jobs and at least **18** to work in non-farm jobs declared hazardous by the Secretary of Labor.

Youths **14** and **15** years old may work outside school hours in various non-manufacturing, non-mining, non-hazardous jobs under the following conditions:

***No more than***
- **3** hours on a school day or **18** hours in a school week;
- **8** hours on a non-school day or **40** hours in a non-school week.

Also, work may not begin before **7 a.m.** or end after **7 p.m.**, except from June 1 through Labor Day, when evening hours are extended to **9 p.m.** Different rules apply in agricultural employment.

**TIP CREDIT**

Employers of "tipped employees" must pay a cash wage of at least $2.13 per hour if they claim a tip credit against their minimum wage obligation. If an employee's tips combined with the employer's cash wage of at least $2.13 per hour do not equal the minimum hourly wage, the employer must make up the difference. Certain other conditions must also be met.

**ENFORCEMENT**

The Department of Labor may recover back wages either administratively or through court action, for the employees that have been underpaid in violation of the law. Violations may result in civil or criminal action.

Employers may be assessed civil money penalties of up to $1,100 for each willful or repeated violation of the minimum wage or overtime pay provisions of the law and up to $11,000 for each employee who is the subject of a violation of the Act's child labor provisions. In addition, a civil money penalty of up to $50,000 may be assessed for each child labor violation that causes the death or serious injury of any minor employee, and such assessments may be doubled, up to $100,000, when the violations are determined to be willful or repeated. The law also prohibits discriminating against or discharging workers who file a complaint or participate in any proceeding under the Act.

**ADDITIONAL INFORMATION**

- Certain occupations and establishments are exempt from the minimum wage and/or overtime pay provisions.
- Special provisions apply to workers in American Samoa and the Commonwealth of the Northern Mariana Islands.
- Some state laws provide greater employee protections; employers must comply with both.
- The law requires employers to display this poster where employees can readily see it.
- Employees under 20 years of age may be paid $4.25 per hour during their first 90 consecutive calendar days of employment with an employer.
- Certain full-time students, student learners, apprentices, and workers with disabilities may be paid less than the minimum wage under special certificates issued by the Department of Labor.

For additional information:

**1-866-4-USWAGE**

(1-866-487-9243) TTY: 1-877-889-5627

WHD U.S. Wage and Hour Division

**WWW.WAGEHOUR.DOL.GOV**

U.S. Department of Labor | Wage and Hour Division

WHD Publication 1088 (Revised July 2009)

# PART IV

# INSURANCE

Refer to
*Kentucky Standard Specifications for Road and Bridge Construction,*
current edition

# PART V

# BID ITEMS

221328

# PROPOSAL BID ITEMS



**Report Date** 6/21/22

## Section: 0001 - PAVING

| LINE | BID CODE | ALT | DESCRIPTION | QUANTITY | UNIT | UNIT PRIC | FP | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| 0010 | 00003 | | CRUSHED STONE BASE | 7,693.00 | TON | | $ | |
| 0020 | 00020 | | TRAFFIC BOUND BASE | 234.00 | TON | | $ | |
| 0030 | 00100 | | ASPHALT SEAL AGGREGATE | 53.00 | TON | | $ | |
| 0040 | 00103 | | ASPHALT SEAL COAT | 6.30 | TON | | $ | |
| 0050 | 00212 | | CL2 ASPH BASE 1.00D PG64-22 | 6,649.00 | TON | | $ | |
| 0060 | 00221 | | CL2 ASPH BASE 0.75D PG64-22 | 470.00 | TON | | $ | |
| 0070 | 00301 | | CL2 ASPH SURF 0.38D PG64-22 | 1,645.00 | TON | | $ | |
| 0080 | 02101 | | CEM CONC ENT PAVEMENT-8 IN | 485.00 | SQYD | | $ | |
| 0090 | 24970EC | | ASPHALT MATERIAL FOR TACK NON-TRACKING | 14.00 | TON | | $ | |

## Section: 0002 - ROADWAY

| LINE | BID CODE | ALT | DESCRIPTION | QUANTITY | UNIT | UNIT PRIC | FP | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| 0100 | 00078 | | CRUSHED AGGREGATE SIZE NO 2 | 875.00 | TON | | $ | |
| 0110 | 01000 | | PERFORATED PIPE-4 IN | 323.00 | LF | | $ | |
| 0120 | 01010 | | NON-PERFORATED PIPE-4 IN | 265.00 | LF | | $ | |
| 0130 | 01020 | | PERF PIPE HEADWALL TY 1-4 IN | 8.00 | EACH | | $ | |
| 0140 | 01314 | | PLUG PIPE | 1.00 | EACH | | $ | |
| 0150 | 01810 | | STANDARD CURB AND GUTTER | 2,768.00 | LF | | $ | |
| 0160 | 01875 | | STANDARD HEADER CURB | 27.00 | LF | | $ | |
| 0170 | 01985 | | DELINEATOR FOR BARRIER - YELLOW | 11.00 | EACH | | $ | |
| 0180 | 01987 | | DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE | 17.00 | EACH | | $ | |
| 0190 | 02014 | | BARRICADE-TYPE III | 12.00 | EACH | | $ | |
| 0200 | 02091 | | REMOVE PAVEMENT | 4,419.00 | SQYD | | $ | |
| 0210 | 02159 | | TEMP DITCH | 3,186.00 | LF | | $ | |
| 0220 | 02160 | | CLEAN TEMP DITCH | 1,593.00 | LF | | $ | |
| 0230 | 02200 | | ROADWAY EXCAVATION | 55,640.00 | CUYD | | $ | |
| 0240 | 02242 | | WATER | 241.00 | MGAL | | $ | |
| 0250 | 02355 | | GUARDRAIL-STEEL W BEAM-S FACE A | 50.00 | LF | | $ | |
| 0260 | 02360 | | GUARDRAIL TERMINAL SECTION NO 1 | 6.00 | EACH | | $ | |
| 0270 | 02391 | | GUARDRAIL END TREATMENT TYPE 4A | 4.00 | EACH | | $ | |
| 0280 | 02429 | | RIGHT-OF-WAY MONUMENT TYPE 1 | 72.00 | EACH | | $ | |
| 0290 | 02430 | | RIGHT-OF-WAY MONUMENT TYPE 1A | 4.00 | EACH | | $ | |
| 0300 | 02432 | | WITNESS POST | 49.00 | EACH | | $ | |
| 0310 | 02483 | | CHANNEL LINING CLASS II | 1,273.00 | TON | | $ | |
| 0320 | 02484 | | CHANNEL LINING CLASS III | 1,367.00 | TON | | $ | |
| 0330 | 02545 | | CLEARING AND GRUBBING (19.7 ACRES) | 1.00 | LS | | $ | |
| 0340 | 02562 | | TEMPORARY SIGNS | 907.00 | SQFT | | $ | |
| 0350 | 02585 | | EDGE KEY | 79.00 | LF | | $ | |
| 0360 | 02602 | | FABRIC-GEOTEXTILE CLASS 1 | 21,948.00 | SQYD | | $ | |
| 0370 | 02604 | | FABRIC-GEOTEXTILE CLASS 1A | 59,162.00 | SQYD | | $ | |
| 0380 | 02607 | | FABRIC-GEOTEXTILE CLASS 2 FOR PIPE | 4,055.00 | SQYD | $2.00 | $ | $8,110.00 |
| 0390 | 02611 | | HANDRAIL-TYPE A-1 | 150.00 | LF | | $ | |
| 0400 | 02650 | | MAINTAIN & CONTROL TRAFFIC | 1.00 | LS | | $ | |

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# PROPOSAL BID ITEMS



**Report Date** 6/21/22

| LINE | BID CODE | ALT | DESCRIPTION | QUANTITY | UNIT | UNIT PRIC | FP | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| 0410 | 02653 | | LANE CLOSURE | 2.00 | EACH | | $ | |
| 0420 | 02671 | | PORTABLE CHANGEABLE MESSAGE SIGN | 2.00 | EACH | | $ | |
| 0430 | 02690 | | SAFELOADING | 3.20 | CUYD | | $ | |
| 0440 | 02701 | | TEMP SILT FENCE | 3,186.00 | LF | | $ | |
| 0450 | 02703 | | SILT TRAP TYPE A | 20.00 | EACH | | $ | |
| 0460 | 02704 | | SILT TRAP TYPE B | 20.00 | EACH | | $ | |
| 0470 | 02705 | | SILT TRAP TYPE C | 20.00 | EACH | | $ | |
| 0480 | 02706 | | CLEAN SILT TRAP TYPE A | 20.00 | EACH | | $ | |
| 0490 | 02707 | | CLEAN SILT TRAP TYPE B | 20.00 | EACH | | $ | |
| 0500 | 02708 | | CLEAN SILT TRAP TYPE C | 20.00 | EACH | | $ | |
| 0510 | 02720 | | SIDEWALK-4 IN CONCRETE | 1,579.00 | SQYD | | $ | |
| 0520 | 02726 | | STAKING | 1.00 | LS | | $ | |
| 0530 | 02731 | | REMOVE STRUCTURE | 1.00 | LS | | $ | |
| 0540 | 03171 | | CONCRETE BARRIER WALL TYPE 9T | 220.00 | LF | | $ | |
| 0550 | 04933 | | TEMP SIGNAL 2 PHASE | 2.00 | EACH | | $ | |
| 0560 | 04953 | | TEMP RELOCATION OF SIGNAL HEAD | 3.00 | EACH | | $ | |
| 0570 | 05950 | | EROSION CONTROL BLANKET | 8,723.00 | SQYD | | $ | |
| 0580 | 05952 | | TEMP MULCH | 63,713.00 | SQYD | | $ | |
| 0590 | 05953 | | TEMP SEEDING AND PROTECTION | 47,785.00 | SQYD | | $ | |
| 0600 | 05963 | | INITIAL FERTILIZER | 2.10 | TON | | $ | |
| 0610 | 05964 | | MAINTENANCE FERTILIZER | 3.40 | TON | | $ | |
| 0620 | 05985 | | SEEDING AND PROTECTION | 66,183.00 | SQYD | | $ | |
| 0630 | 05992 | | AGRICULTURAL LIMESTONE | 41.00 | TON | | $ | |
| 0640 | 06510 | | PAVE STRIPING-TEMP PAINT-4 IN | 71,300.00 | LF | | $ | |
| 0650 | 06514 | | PAVE STRIPING-PERM PAINT-4 IN | 25,488.00 | LF | | $ | |
| 0660 | 08901 | | CRASH CUSHION TY VI CLASS BT TL2 | 1.00 | EACH | | $ | |
| 0670 | 10020NS | | FUEL ADJUSTMENT | 26,032.00 | DOLL | $1.00 | $ | $26,032.00 |
| 0680 | 10030NS | | ASPHALT ADJUSTMENT | 34,264.00 | DOLL | $1.00 | $ | $34,264.00 |
| 0690 | 20071EC | | JOINT ADHESIVE | 6,372.00 | LF | | $ | |
| 0700 | 20191ED | | OBJECT MARKER TY 3 | 5.00 | EACH | | $ | |
| 0710 | 21802EN | | G/R STEEL W BEAM-S FACE (7 FT POST) | 675.00 | LF | | $ | |
| 0720 | 23010EN | | PAVE MARK TEMP PAINT STOP BAR-24 IN | 357.00 | LF | | $ | |
| 0730 | 23300ED | | CRUSHED STONE | 200.00 | TON | | $ | |
| 0740 | 24805ED | | OBJECT MARKER TYPE 4 | 1.00 | EACH | | $ | |
| 0750 | 24814EC | | PIPELINE INSPECTION | 1,201.00 | LF | | $ | |
| 0760 | 24978ED | | RECONSTRUCT STONE MASONRY WALL | 20.00 | LF | | $ | |
| 0770 | 25072EC | | RELOCATE TEMPORARY SIGNALS | 1.00 | LS | | $ | |

## Section: 0003 - DRAINAGE

| LINE | BID CODE | ALT | DESCRIPTION | QUANTITY | UNIT | UNIT PRIC | FP | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| 0780 | 00440 | | ENTRANCE PIPE-15 IN | 283.00 | LF | | $ | |
| 0790 | 00443 | | ENTRANCE PIPE-24 IN | 58.00 | LF | | $ | |
| 0800 | 00451 | | ENTRANCE PIPE-18 IN EQUIV | 54.00 | LF | | $ | |
| 0810 | 00462 | | CULVERT PIPE-18 IN | 93.00 | LF | | $ | |
| 0820 | 00464 | | CULVERT PIPE-24 IN | 100.00 | LF | | $ | |
| 0830 | 00466 | | CULVERT PIPE-30 IN | 209.00 | LF | | $ | |
| 0840 | 00468 | | CULVERT PIPE-36 IN | 82.00 | LF | | $ | |

221328

# PROPOSAL BID ITEMS



**Report Date** 6/21/22

| LINE | BID CODE | ALT | DESCRIPTION | QUANTITY | UNIT | UNIT PRIC | FP | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| 0850 | 00470 | | CULVERT PIPE-48 IN | 104.00 | LF | | $ | |
| 0860 | 00471 | | CULVERT PIPE-54 IN | 56.00 | LF | | $ | |
| 0870 | 00500 | | CULVERT PIPE-54 IN EQUIV | 47.00 | LF | | $ | |
| 0880 | 00522 | | STORM SEWER PIPE-18 IN | 279.00 | LF | | $ | |
| 0890 | 00526 | | STORM SEWER PIPE-30 IN | 53.00 | LF | | $ | |
| 0900 | 00554 | | STORM SEWER PIPE-24 IN EQUIV | 72.00 | LF | | $ | |
| 0910 | 00556 | | STORM SEWER PIPE-30 IN EQUIV | 158.00 | LF | | $ | |
| 0920 | 01204 | | PIPE CULVERT HEADWALL-18 IN | 4.00 | EACH | | $ | |
| 0930 | 01209 | | PIPE CULVERT HEADWALL-24 IN EQUIV | 1.00 | EACH | | $ | |
| 0940 | 01210 | | PIPE CULVERT HEADWALL-30 IN | 2.00 | EACH | | $ | |
| 0950 | 01212 | | PIPE CULVERT HEADWALL-36 IN | 1.00 | EACH | | $ | |
| 0960 | 01216 | | PIPE CULVERT HEADWALL-48 IN | 4.00 | EACH | | $ | |
| 0970 | 01219 | | PIPE CULVERT HEADWALL-54 IN EQUIV | 2.00 | EACH | | $ | |
| 0980 | 01440 | | SLOPED BOX INLET-OUTLET TYPE 1 | 1.00 | EACH | | $ | |
| 0990 | 01451 | | S & F BOX INLET-OUTLET-24 IN | 1.00 | EACH | | $ | |
| 1000 | 01452 | | S & F BOX INLET-OUTLET-30 IN | 3.00 | EACH | | $ | |
| 1010 | 01453 | | S & F BOX INLET-OUTLET-36 IN | 1.00 | EACH | | $ | |
| 1020 | 01490 | | DROP BOX INLET TYPE 1 | 2.00 | EACH | | $ | |
| 1030 | 01493 | | DROP BOX INLET TYPE 2 | 2.00 | EACH | | $ | |
| 1040 | 01505 | | DROP BOX INLET TYPE 5B | 1.00 | EACH | | $ | |
| 1050 | 01756 | | MANHOLE TYPE A | 1.00 | EACH | | $ | |
| 1060 | 21800EN | | BORE AND JACK PIPE-30 IN | 45.00 | LF | | $ | |
| 1070 | 24026EC | | PIPE CULVERT HEADWALL-54 IN | 2.00 | EACH | | $ | |

## Section: 0004 - BRIDGE

| LINE | BID CODE | ALT | DESCRIPTION | QUANTITY | UNIT | UNIT PRIC | FP | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| 1080 | 08003 | | FOUNDATION PREPARATION | 1.00 | LS | | $ | |
| 1090 | 08100 | | CONCRETE-CLASS A | 86.50 | CUYD | | $ | |
| 1100 | 08150 | | STEEL REINFORCEMENT | 9,775.00 | LB | | $ | |

## Section: 0005 - WATERLINE

| LINE | BID CODE | ALT | DESCRIPTION | QUANTITY | UNIT | UNIT PRIC | FP | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| 1110 | 14003 | | W CAP EXISTING MAIN | 2.00 | EACH | | $ | |
| 1120 | 14037 | | W PIPE DUCTILE IRON 08 INCH | 200.00 | LF | | $ | |
| 1130 | 14081 | | W SERVICE RELOCATE | 1.00 | EACH | | $ | |
| 1140 | 14095 | | W TIE-IN 08 INCH | 2.00 | EACH | | $ | |
| 1150 | 23510EC | | PROJECT CLEANUP | 1.00 | LS | | $ | |
| 1160 | 24452EC | | SEEDING | 1.00 | ACRE | | $ | |

## Section: 0006 - MOBILIZATION &/OR DEMOBILIZATION

| LINE | BID CODE | ALT | DESCRIPTION | QUANTITY | UNIT | UNIT PRIC | FP | AMOUNT |
|---|---|---|---|---|---|---|---|---|
| 1170 | 02568 | | MOBILIZATION | 1.00 | LS | | $ | |
| 1180 | 02569 | | DEMOBILIZATION | 1.00 | LS | | $ | |