



**CALL NO. 316**

**CONTRACT ID. 141296**

**HOPKINS COUNTY**

**FED/STATE PROJECT NUMBER FD04 SPP 054 3052 000-001**

**DESCRIPTION COLLEGE DRIVE (KY 3052)**

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

**PRIMARY COMPLETION DATE 11/20/2015**

**LETTING DATE: December 12,2014**

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN STANDARD TIME December 12,2014. Bids will be publicly announced at 10:00 AM EASTERN STANDARD 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 - 02

**CONTRACT ID - 141296**

**FD04 SPP 054 3052 000-001**

**COUNTY - HOPKINS**

**PCN - DE05430521496**

**FD04 SPP 054 3052 000-001**

COLLEGE DRIVE (KY 3052) (MP 0.000) CONSTRUCT A LEFT TURN LANE BY PROVIDING A THREE LANE CURVE ON KY 3052 (MP 0.753), A DISTANCE OF 0.76 MILES.GRADE & DRAIN WITH ASPHALT SURFACE SYP NO. 02-08507.00.

GEOGRAPHIC COORDINATES LATITUDE 37:21:49.00 LONGITUDE 87:30:11.00

**COMPLETION DATE(S):**

COMPLETED BY 11/20/2015

APPLIES TO ENTIRE 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 Expedite Bidding Program available on the Internet web site of the Department of Highways, Division of Construction Procurement. ([www.transportation.ky.gov/construction-procurement](http://www.transportation.ky.gov/construction-procurement))

The Bidder must download the bid file located on the Bid Express website ([www.bidx.com](http://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 is advised that the Underground Facility Damage Protection Act of 1994, became law January 1, 1995. It is the contractor's responsibility to determine the impact of the act regarding this project, and take all steps necessary to be in compliance with the provision of the act.

### **SPECIAL NOTE FOR PIPE INSPECTION**

Contrary to Section 701.03.08 of the 2012 Standard Specifications for Road and Bridge Construction and Kentucky Method 64-114, certification by the Kentucky Transportation Center for prequalified Contractors to perform laser/video inspection is not required on this contract. It will continue to be a requirement for the Contractor performing any laser/video pipe inspection to be prequalified for this specialized item with the Kentucky Transportation Cabinet-Division of Construction Procurement.

### **SPECIAL NOTE FOR COMPOSITE OFFSET BLOCKS**

Contrary to the Standard Drawings (2012 edition) the Cabinet will allow 6” composite offset blocks in lieu of wooden offset blocks, except as specified on proprietary end treatments and crash cushions. The composite blocks shall be selected from the Cabinet’s List of Approved Materials.

### **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](mailto: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](http://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. (See attachment)

10/29/12



**Steven L. Beshear**  
Governor

Commonwealth of Kentucky  
Finance and Administration Cabinet  
**OFFICE OF THE SECRETARY**  
Room 383, Capitol Annex  
702 Capital Avenue  
Frankfort, KY 40601-3462  
(502) 564-4240  
Fax (502) 564-6785

**Lori H. Flanery**  
Secretary

## **SECRETARY'S ORDER 11-004**

### **FINANCE AND ADMINISTRATION CABINET**

#### **Vendor Document Disclosure**

**WHEREAS**, in order to promote accountability and transparency in governmental operations, the Finance and Administration Cabinet believes that a mechanism should be created which would provide for review and assistance to an Executive Branch agency if said agency cannot obtain access to documents that it deems necessary to conduct a review of the records of a private vendor that holds a contract to provide goods and/or services to the Commonwealth; and

**WHEREAS**, in order to promote accountability and transparency in governmental operations, the Finance and Administration Cabinet believes that a mechanism should be created which would provide for review and assistance to an Executive Branch agency if said agency cannot obtain access to documents that it deems necessary during the course of an audit, investigation or any other inquiry by an Executive Branch agency that involves the review of documents; and

**WHEREAS**, KRS 42.014 and KRS 12.270 authorizes the Secretary of the Finance and Administration Cabinet to establish the internal organization and assignment of functions which are not established by statute relating to the Finance and Administration Cabinet; further, KRS Chapter 45A.050 and 45A.230 authorizes the Secretary of the Finance and Administration Cabinet to procure, manage and control all supplies and services that are procured by the Commonwealth and to intervene in controversies among vendors and state agencies; and

**NOW, THEREFORE**, pursuant to the authority vested in me by KRS 42.014, KRS 12.270, KRS 45A.050, and 45A.230, I, Lori H. Flanery, Secretary of the Finance and Administration Cabinet, do hereby order and direct the following:

- I. Upon the request of an Executive Branch agency, the Finance and Administration Cabinet ("FAC") shall formally review any dispute arising where the agency has requested documents from a private vendor that holds a state contract and the vendor has refused access to said documents under a claim that said documents are not directly pertinent or relevant to the agency's inquiry upon which the document request was predicated.
- II. Upon the request of an Executive Branch agency, the FAC shall formally review any situation where the agency has requested documents that the agency deems necessary to

conduct audits, investigations or any other formal inquiry where a dispute has arisen as to what documents are necessary to conclude the inquiry.

- III. Upon receipt of a request by a state agency pursuant to Sections I & II, the FAC shall consider the request from the Executive Branch agency and the position of the vendor or party opposing the disclosure of the documents, applying any and all relevant law to the facts and circumstances of the matter in controversy. After FAC's review is complete, FAC shall issue a Determination which sets out FAC's position as to what documents and/or records, if any, should be disclosed to the requesting agency. The Determination shall be issued within 30 days of receipt of the request from the agency. This time period may be extended for good cause.
- IV. If the Determination concludes that documents are being wrongfully withheld by the private vendor or other party opposing the disclosure from the state agency, the private vendor shall immediately comply with the FAC's Determination. Should the private vendor or other party refuse to comply with FAC's Determination, then the FAC, in concert with the requesting agency, shall effectuate any and all options that it possesses to obtain the documents in question, including, but not limited to, jointly initiating an action in the appropriate court for relief.
- V. Any provisions of any prior Order that conflicts with the provisions of this Order shall be deemed null and void.

**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 Expedite Bidding Program. Submittal of the Affidavit should be done along with the bid in Bid Express.**

03/01/2011

### **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.

### **DGA BASE**

Unless otherwise noted, the Department estimates the rate of application for DGA Base to be 115 lbs/sy per inch of depth.

### **DGA BASE FOR SHOULDERS**

Unless otherwise noted, the Department estimates the rate of application for DGA Base for Shoulders to be 115 lbs/sy per inch of depth. The Department will not measure necessary grading and/or shaping of existing shoulders prior to placing of DGA Base, but shall be incidental to the Contract unit price per ton for DGA Base.

Accept payment at the Contract unit price per ton as full compensation for all labor, materials, equipment, and incidentals for grading and/or shaping of existing shoulders and furnishing, placing, and compacting the DGA Base.

### **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 FOR  
GUARDRAIL END TREATMENT TYPE 1**

Contrary to KYTC Standard Drawing RBR-020-05 the guardrail end treatment ET-Plus manufactured by Trinity Industries will not be permitted as an option for bid item “Guardrail End Treatment Type 1”.

# Right-of-Way Certification Form

Revised 2/22/11

Federal Funded

Original

State Funded

Re-Certification

This form must be completed and submitted to FHWA with the PS&E package for federal-aid funded Interstate, Appalachia, and Major projects. This form shall also be submitted to FHWA for all federal-aid projects that fall under Conditions No. 2 or 3 outlined elsewhere in this form. When Condition No. 2 or 3 apply, KYTC shall resubmit this ROW Certification prior to construction contract Award. For all other federal-aid projects, this form shall be completed and retained in the KYTC project file.

Date: March 7, 2014

Project Name: College Road (KY 3052)

Letting Date: \_\_\_\_\_

Project #: JL03 054 8350101R

County: Hopkins

Item #: 02-8507.00

Federal #: \_\_\_\_\_

Description of Project: Construct a left turn lane by providing a three lane curve on KY 3052.

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

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

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

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

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

**Condition 2.** Although all necessary rights-of-way have not been fully acquired, the right to occupy and to use all rights-of-way required for the proper execution of the project has been acquired. Trial or appeal of some parcels may be pending in court and on other parcels full legal possession has not been obtained, but right of entry has been obtained, the occupants of all lands and improvements have vacated, and KYTC has physical possession and right to remove, salvage, or demolish all improvements. Fair market value has been paid or deposited with the court for most parcels. Fair market value for all pending parcels will be paid or deposited with the court prior to AWARD of construction contract. (See note 1 below.)

**Note 1:** The KYTC shall re-submit a right-of-way certification form for this project prior to AWARD of all Federal-Aid construction contracts. Award must not be made until after KYTC has obtained full legal possession and fair market value for all parcels has been paid or deposited with the court and FHWA has concurred in the re-submitted right-of-way certification.

# Right-of-Way Certification Form

Revised 2/22/11

**Condition 3.** The acquisition or right of occupancy and use of a few remaining parcels are not complete and/or some parcels still have occupants. However, all remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. The KYTC is hereby requesting authorization to advertise this project for bids and to proceed with bid letting even though the necessary rights-of-way will not be fully acquired, and/or some occupants will not be relocated, and/or the fair market value will not be paid or deposited with the court for some parcels 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. A full explanation and reason for this request, including identification of each such parcel and dates on which acquisitions, payments, and relocations will be completed, is attached to this certification form for FHWA concurrence. (See note 2.)

**Note 2:** The KYTC may request authorization on this basis only in unique and unusual circumstances. Proceeding to bid letting shall be the exception and never become the rule. In all cases, the KYTC shall make extraordinary efforts to expedite completion of the acquisition, payment for all affected parcels, and the relocation of all relocatees prior to AWARD of all Federal-Aid construction contracts or force account construction.

Approved: Jennifer K. Cox  
Printed Name

[Signature] 3/7/14  
Signature Right-of-Way Supervisor

Approved: Keith M' Donald  
Printed Name

[Signature] 3/7/14  
Signature KYTC, Director of ROW & Utilities

Approved: \_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature FHWA, ROW Officer (when applicable)

# Right-of-Way Certification Form

Revised 2/22/11

Date: March 7, 2014

Project Name: College Road (KY 3052)  
Project #: JL03 054 8350101R  
Item #: 02-8507.00  
Letting Date: \_\_\_\_\_

County: Hopkins  
Federal #: \_\_\_\_\_

This project has 10 total number of parcels to be acquired, and 0 total number of individuals or families to be relocated, as well as 0 total number of businesses to be relocated.

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

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

There are 0 billboards and/or 0 cemeteries involved on this project.

There are 0 water or monitoring wells on parcels \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. All have been acquired and are the responsibility of the project contractor to close/cap.

Form Effective Date: April 1, 2006  
Last Revised: February 22, 2011

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

**Hopkins County  
Item No 2-8507  
KY 3052**

The following is a list of utility companies involved on this project. Contractor is advised to use caution and call **BUD** prior to beginning work.

**AT&T:** will complete relocation work by 1/30/15

**Atmos:** Energy has completed relocation work

**The City of Madisonville Water and Sewer:** has included the relocation work in the roadway contract.

**PROTECTION OF UTILITIES**

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

The contractor is advised to contact the **BUD one-call system at 1-800-752-6007** at least two working days prior to excavating. Contractor should be aware that owners of underground facilities are not required to be members of the BUD one-call system. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the project area.



**TECHNICAL SPECIFICATIONS**

**FOR**

**KY 3052 (College Drive)**  
**Water & Sewer Utility Relocation**

**FOR THE**

**CITY OF MADISONVILLE, KY**

**November 2014**

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## **TECHNICAL SPECIFICATIONS**

## **SECTION 01000**

### **GENERAL REQUIREMENTS**

#### PART 1 - GENERAL

##### 1.01 **SCOPE**

- A. This section of the Specifications summarizes in general terms the scope of the Project.
- B. Except as otherwise specifically stated in the Contract Documents, provide and pay for all materials, labor, tools, equipment, lights, heat, transportation, superintendence, temporary facilities, construction of every nature, taxes legally collectable because of the Work, and all other services, fees and facilities of every nature whatsoever necessary to execute the Work to be done under the Contract and deliver the Work complete in every respect within the specified Contract Time.
- C. All contractors, subcontractors, suppliers, and other employers involved with work at the Project Site shall be responsible for compliance with all federal, state, local, and Project Owner's regulations, standards, and codes in effect during the Contract Time.

##### 1.02 **PROJECT**

This project consists of the relocation, replacement and rehabilitation of existing water service and sewer main infrastructure for the Kentucky Transportation Cabinet's proposed widening improvements to College Drive in Madisonville. The total project will include the installation of approximately 1,700 linear feet of 2-inch water service lines, the replacement of 11 water meters, cured-in-place pipe rehabilitation of approximately 5,000 linear feet of 8-inch sewer main and 6" sewer laterals, manhole rehabilitation, cleanout installations, and various spot improvements to the existing water main appurtenances.

##### 1.03 **RECORD DRAWINGS**

At the completion of the Contract Time, the Contractor shall deliver to the Owner, thru the Engineer, the complete intact copy of Record Drawings. Note that it shall be the responsibility of the Contractor to keep an accurate set of As-Built Drawings on the job site at all times. Submission of suitable As-Built Drawings will be required prior to issuance of final payment. In addition, verification by the Engineer that record drawings are periodically maintained will be required prior to each partial

payment by the Owner.

#### 1.04 SUBSTITUTIONS

"Approved equal", "equal", and "equal with prior approval" phrases shall be defined as material and/or equipment of similar construction and equal quality only as approved by the Engineer. Requests for approval shall be submitted to the Engineer no less than three (3) working days prior to the opening of bids. No substitutions or equivalents will be considered during the Contract Time, except for minor substitutions due to unavailability of specified items.

#### 1.05 OBSTRUCTIONS

- A. All known pipelines and other existing underground installations and structures in the vicinity of the work to be performed under this Contract are shown on the Drawings according to the best information available to the Owner and Engineer. The Contractor shall field verify the horizontal and vertical location of all utility lines within the path of the proposed water main prior to construction of the main.
- B. The Owner makes no express or implied guarantee for the accuracy of the information shown. The Contractor shall make every effort to locate all underground pipelines including utility service lines, conduits, and other structures by contacting owners of underground utilities, prospecting, or otherwise, in advance of all earthwork operations.
- C. Any delay or inconvenience to the Contractor caused by pipelines or other underground structures or obstructions not shown on the drawings, or found in a location different than those indicated, shall be handled in accordance with the General Conditions.
- D. All incidental damage to existing utilities which are shown on the drawings, or which are made known to the Contractor prior to excavation, shall be repaired by the owning utility or the Contractor as directed, at the expense of the Contractor.
- E. When an accidentally damaged utility is considered, in the opinion of the owning utility, of an importance to require twenty-four (24) hours per day work, the Contractor shall at all times provide necessary labor and equipment as required to perform the repair or provide aid to the utility in the repair.

- F. All obstructions on which work is to be performed by the owning utility or by others shall be carefully exposed by the Contractor without damage and protected. Withhold construction operations as required to allow owning utility to perform necessary work to temporarily or permanently relocate their facility. Provide owning utility working space and access to the job.
- G. Obstructions which are replaced within the limits of the Contractor's normal excavation shall be backfilled by the Contractor along with the normal backfilling. Damage to the facility during backfilling shall be the responsibility of the Contractor.

#### 1.06 COMMUNICATIONS

All notices, demands, requests, instructions, reports, approvals, proposals, Change Orders, Field Orders, and claims shall be in writing.

#### 1.07 LAYOUT OF WORK

- A. The Contractor shall immediately upon entering the Project Site for the purpose of beginning the work, locate all general reference points and take such action as necessary to prevent their destruction; layout his own and be responsible for, all lines, elevations, and measurements of all work to be executed under the Contract.

The Contractor shall exercise proper precautions to verify fixtures shown on the Drawings before laying out the work, and will be held responsible for any error resulting from his failure to exercise such precautions.

- B. The Contractor shall be responsible for the general overall coordination of the work. Each Sub-Contractor shall carefully check the Drawings, Specifications, and the Project Site in order to advise and coordinate their phase of the Work. Each Subcontractor shall leave the required space and clearances for the work of others, field check all dimensions and file a written report to the Engineer where discrepancies occur between the work to be performed and the Drawings, Specifications, or Project Site conditions. If no report is filed prior to approvals of Shop Drawings and Samples, it will be assumed that no conflict occurs. Resolutions of conflicts after Shop Drawings and Sample approvals shall be resolved by the Engineer and the conflict corrected in the field at no increase in the Contract Sum.

#### 1.08 TEMPORARY FACILITIES

- A. The Contractor shall provide, install and maintain adequate temporary sanitation facilities at the Site. These temporary facilities shall be approved by the health regulatory agency having jurisdiction at the site and by the Engineer.
- B. Upon completion of the work, all temporary contractor equipment and structures shall be removed from the site. At no time shall the sight distance from the stop bar at any intersection be inhibited by the Contractor's equipment or pipe work materials.

#### 1.09 PRODUCT HANDLING

Materials delivered to and stored on the site must be handled in a careful manner as to prevent any damage to the materials. All materials and equipment damaged during manufacture, shipment, delivery, storage, or construction shall be replaced with material or equipment of exactly the same kind by the Contractor.

#### 1.10 TESTING, ADJUSTMENT AND BALANCING OF SYSTEMS

The Contractor shall perform all required testing of installed piping, equipment, etc. as required by these Technical Specifications and the owing utility specifications. Adjustments of process equipment will be the responsibility of the Contractor and/or equipment supplier. All systems shall be adjusted and balanced to the approval of the Engineer prior to project closeout.

#### 1.11 TRAFFIC CONTROL

- A. Follow all guidelines as specified in the Kentucky Department of Highways Manual on Uniform Traffic Control Devices. In addition, the following provisions must be met prior to commencing work:
  - 1. Install 48" X 48" permanent "Utility Construction Ahead" signs with two (2) 4" X 4" posts, seven (7) feet high to the lowest portion of the sign, and seven (7) feet from the edge of pavement unless otherwise approved by the Engineer.
  - 2. Use traffic control drums at night in lieu of traffic control cones.
  - 3. Work will not be permitted until proper signals and traffic control measures are implemented.

## 1.12 REFERENCED STANDARDS

- A. Referenced standards and specifications contained in the Technical Specifications are as follows:
1. ACI - American Concrete Institute
  2. AISC - American Institute of Steel Construction, Inc
  3. ANSI - American National Standards Institute
  4. ASA - American Standards Association(also designed by USASI)
  5. ASTM - American Society for Testing Materials, Inc.
  6. AWS - American Welding Society
  7. AWWA - American Water Works Association
  8. PCA - Portland Cement Association
  9. UL - Underwriter's Laboratories, Inc.
  10. USASI - United States of American Standards Institute (also designated as ASA)
  11. Kentucky Department of Highways, Standard Specifications for Road and Bridge Construction, latest Edition.
  12. ASME - American Society of Mechanical Engineers
  13. ASI - American Steel Institute
  14. NBFU - National Board Fire Underwriters

## SECTION 01310

### CONSTRUCTION SCHEDULE

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

A. Work Included: To assure adequate planning and execution of the work so that the work is completed within the number of days allowed in the contract, and to assist the Engineer in appraising the reasonableness of the proposed schedule and in evaluating progress of the work, prepare and maintain the schedules and reports described in this section.

B. Definitions.

"Day" used throughout this section, unless otherwise stated, means "calendar day".

##### 1.02 QUALITY ASSURANCE

A. Reliance Upon Approved Schedule.

1. The construction schedule as approved by the Engineer will be an integral part of the contract, and will establish interim contract completion dates for the various activities.
2. Should any activity not be completed within fifteen (15) days after the stated scheduled date, the Engineer shall have the right to order the Contractor to expedite completion of the activity by whatever means the Engineer deems appropriate and necessary, without additional compensation to the Contractor.
3. Should any activity be thirty (30) or more days behind schedule, the Engineer shall have the right to perform the activity or have the activity performed by whatever method the Engineer deems appropriate.
4. Costs incurred by the Engineer in connection with expediting construction activity under this Article shall be reimbursed to the Engineer by the Contractor.
5. It is expressly understood and agreed that failure by the Engineer to exercise the option to either order the Contractor to expedite an activity or to expedite the activity by other means shall not be considered precedent-setting for any other activities.

6. Construction in progress meetings will be held monthly with the Contractor and the Engineer.

### 1.03 SUBMITTALS

- A. Construction Schedule. Within ten (10) days after receipt of Notice to Proceed and prior to mobilization, submit a construction schedule.
- B. Periodic Reports. The construction schedule shall be updated as described in Part Three of this section every two (2) weeks (14 days).

## PART 2 - PRODUCTS

### 2.01 CONSTRUCTION ANALYSIS

- A. Diagram/Chart. Graphically show the order and interdependence of all activities necessary to complete the work, and the sequence in which each activity is to be accomplished, as planned by the Contractor and his project field superintendent in coordination with all subcontractors whose work is shown on the diagram. Activities shown on the diagram shall include, but are not necessarily limited to:
  1. Project mobilization;
  2. Submittals and approvals of shop drawings and samples;
  3. Procurement of equipment and critical materials;
  4. Fabrication of special material and equipment, and their installation and testing;
  5. Final cleanup;
  6. Final inspection and testing; and
  7. All activities by the Engineer that affect progress, required dates for completion, or both, for all and for each part of the work.

The selection and number of activities shall be subject to the Engineer's approval.

Show on the diagram, as a minimum for each activity, the following:

1. Preceding and following event numbers;
2. Estimated duration of activities;

3. Earliest start date (by calendar date);
4. Latest start date (by calendar date);
5. Earliest finish date (by calendar date);
6. Latest finish date (by calendar date);
7. Slack or float (in calendar days); and
8. Percentage of activity completed.

C. Periodic Reports. If computer-aided means are used, list the activities in computer printout sorts as follows:

1. By the preceding event number from lowest to highest, and then in order of the following event number;
2. By the amount of float, then in order of preceding event numbers, and then in order of succeeding event numbers;
3. In order of preceding event numbers, and then in order of succeeding event numbers (show the dollar amount and dollars spent to date for each activity); and
4. Other sorts requested by the Engineer, for which the Contractor will be reimbursed in accordance with the General Conditions provisions for "Changes."

If computer-aids are not used, provide equivalent information to the approval of the Engineer.

## PART 3 - EXECUTION

### 3.01 CONSTRUCTION SCHEDULE

A. Contents.

1. Show all activities of the Contractor under this work for the period between receipt of Notice to Proceed through project completion.
2. Complete the construction analysis described in Article 2.01 and 2.02 showing all activities of the Contractor under this project (contract).

### 3.02 PERIODIC REPORTS

#### A. Construction Schedule.

1. Report actual progress by updating the mathematical analysis.
2. Note on the summary report, or clearly show on a revised issue of affected portions of the detailed diagram, all revisions causing changes in the detailed program.
3. Revise the summary report as necessary for clarity.
4. Show activities or portions of activities completed during the reporting period, and their actual value.
5. State the percentage of work actually completed and scheduled as of the report date, and the progress along the critical path in terms of days ahead of or behind the allowable dates.
6. If the work is behind schedule, also report progress along other paths with negative slack.
7. Include a narrative report which shows, but is not necessarily limited to:
  - a. A description of the problem areas, current and anticipated;
  - b. Delaying factors, and their impact; and
  - c. An explanation of corrective actions taken or proposed.

Show the date of the latest revision. Submit in accordance with this section.

END OF SECTION

## SECTION 01720

### PROJECT RECORD DOCUMENTS

#### PART I – GENERAL

##### 1.1 DESCRIPTION

###### A. Work Included

1. During the construction process, maintain an accurate record of changes and other pertinent, required measurements in the Contract Documents, as described in Section 3.1 below.
2. Upon completion of the Work, transfer the recorded changes and other pertinent, required measurements to a set of Record Documents, as described in Section 3.2 below.

###### B. Related Work

1. Documents affecting work of this Section include, but are not necessarily limited to, Project Drawings, General Conditions, Supplementary Conditions, and Technical Specifications of the Project Manual.
2. Other requirements affecting Project Record Documents may appear in other pertinent Sections in the Project Manual.

##### 1.2 QUALITY ASSURANCE

A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff, as approved by the Engineer. Identify this person during the pre-construction meeting. During construction, maintain one set of job record Drawings strictly for use in preparation of Record Drawings.

###### B. Accuracy of Records

1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each sheet of the project Drawings.
2. Accuracy of records shall be such that future searches for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Drawings.

C. Make entries within one calendar week of installation of the facilities.

##### 1.3 SUBMITTALS

A. The Engineer's approval of the current status of Project Record Documents may be prerequisite to the Engineer's approval or requests for partial payment and shall be a prerequisite to the Engineer's approval of the request for final payment.

B. Prior to submitting each request for partial payment, secure the Engineer's (or his assigned field representative's) approval of the current status of the Project Record Documents.

C. Prior to submitting request for final payment, deliver the final Project Record Documents to the Engineer and secure his approval.

#### 1.4 PRODUCT HANDLING

- A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work. After project completion, transfer all of the recorded data to the final Project Record Documents.
- B. In the event of Contractor's loss of recorded data, use means necessary to field verify and secure the data to the Engineer's approval.
  - 1. If necessary, in the opinion of the Engineer, remove and replace concealing materials.
  - 2. If removal and replacement of concealing materials is warranted, provide replacements to the standards originally required by the Contract Documents and at no additional cost to the Owner.

### PART 2 – PRODUCTS

#### 2.1 RECORD DOCUMENTS

- A. Job Set(s) – Promptly following receipt of the Owner's Notice to Proceed, secure from the Engineer at no charge to the Contractor three complete sets of all Contract Documents. Maintain one set of documents on the job site for day to day use. Maintain one set on the job site for day to day Record Drawing preparation. Obtain Engineer's approval, if in the Contractor's opinion, he can maintain accurate day to day Record Drawing information on his day to day use set of Contract Documents.
- B. Office Set – Maintain one set of Contract Documents off-site for use during final data / information transfer and for delivery of final Record Drawings.
- C. Final Record Documents – Upon substantial completion of the Work, and prior to issuance of final payment request, deliver one set to the Engineer for approval.

### PART 3 – EXECUTION

#### 3.1 MAINTENANCE OF JOB SET

- A. Immediately upon receipt of the job set described in Paragraph 2.1-A above, identify each of the Documents with the title, "RECORD DOCUMENTS – JOB SET" and "RECORD DOCUMENTS – FINAL SET."
- B. Method of Drawing Entry
  - 1. Using an erasable, colored-pencil (not ink or indelible pencil), clearly describe changes or other required dimensional data by graphic line and note as deemed reasonable by the Engineer.
  - 2. Date all entries to obtain a somewhat accurate record of facility installation dates.
  - 3. Call attention to the entry by a "cloud" drawn around the areas or areas affected.
  - 4. In the event of overlapping changes, use different colors for the overlapping changes.
- C. Required Drawing Entries
  - 1. Record any changes to the Contract Documents in the Record Documents. Changes may include but are not limited to: grade or alignment changes, plan and/or profile dimensional changes, conduit re-arrangements, electrical or control reconfiguring, structural design modifications, piping, fitting, or manhole re-alignments, etc.

2. Record the required dimensional information (whether specifically changed in the contract or not) for underground utilities as follows:
  - (a) Where utilities generally parallel roadways, record perpendicular, lateral dimensions (to the nearest 0.5 feet) from roadway centerlines to the pipe or conduit centerlines on maximum of 100' intervals along the roadway and where the utility alignment changes.
  - (b) Record depth of cover dimensions (to the nearest 0.1 feet) at each of the locations referenced in Section 3.1.C.2.a above and at each fitting (whether vertical or horizontal) or fitting cluster along the utility alignment.
  - (c) Record three individual lateral dimensions (to the nearest 0.5 feet) from valve and manhole centerlines to permanent physical objects such as headwalls, fire hydrants, building corners, roadway centerlines, etc., that are shown on the Drawings.
  - (d) Record depths of cover (to the nearest 0.1 feet), centerline stations and offset dimensions (to the nearest 0.5 feet and indicating left or right offsets) along a gravity sewer line, for each lateral service.
  - (e) Record depth of cover dimensions (to nearest 0.5') for all bored service lines at intervals not exceeding 20' along the bore path. This information shall be sketched on the appropriate cross section to depict the actual bore path.

D. Schematic Conversion

1. In some cases on the Drawings, the arrangement of conduits, ducts, circuits, piping, fittings, manholes, services, and similar items, are shown schematically and are not intended to portray precise physical layout.
  - (a) In accordance with the contract intent, final physical arrangement is determined by the Contractor, but subject to the Engineer's approval.
  - (b) However, design of future modifications of the facility may require accurate information as to the final physical layout of items that are shown only schematically on the Drawings.
2. Show on the Record Drawings, by dimension accurate to within (.01 feet), the centerline of each run of items such as are described in subparagraph 3.1-D-1 above.
  - (a) Clearly identify the item by accurate note such as "cast iron drain", "(size & material) water or sewer line", "(size & material) conduit", "(size & degree) fitting", etc.
  - (b) Show, by symbol, note, or elevation the vertical location of the item ("under slab", "in ceiling plenum", "exposed", "feet MSL", etc.).
3. The Engineer may waive the requirements for conversion of schematic layouts where, in the Engineer's judgement, conversion serves no useful purpose. However, do not rely upon waives being issued except as specifically issued in writing by the Engineer.

3.2 FINAL PROJECT RECORD DOCUMENTS

- A. The purpose of the final Project Record documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future

modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.

B. Transfer of data to Drawings

1. Carefully transfer change data shown on the job set of Record Drawings to the corresponding Office Set of Drawings, coordinating the changes as required.
2. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of all required items.
3. Identify each entry by drawing a “cloud” around the area or areas affected.
4. Show entries neatly, consistently, and with the proper notations in a well-organized workmanlike manner.

C. Review and submittal

1. Submit the completed, final set of Project Record Documents to the Engineer as described in Section 1.3 above.
2. Participate in review meetings as required.
3. Make required changes and promptly deliver the final Project Record Documents to the Engineer.

- 3.3 CHANGES SUBSEQUENT TO ACCEPTANCE – The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion of the project and final acceptance of the Record Drawings, except for changes resulting from work performed under Warranty.

END OF SECTION

## SECTION 02110

### SITE CLEARING

#### PART 1 - GENERAL

##### 10.1 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

##### 1.02 SUMMARY

This Section includes the following:

Protection of existing trees.

Removal of trees and other vegetation.

Topsoil stripping.

Clearing and grubbing.

##### 1.03 PROJECT CONDITIONS

- A. Traffic. Conduct site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
- B. Protection of Existing Improvements. Provide protections necessary to prevent damage to existing improvements to remain in place.  
  
Protect improvements on adjoining properties and on Owner's property.
- C. Restore damaged improvements to their original condition, as acceptable to property owner.
- D. Protection of Existing Trees and Vegetation. Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.

- E. Water trees and other vegetation to remain within limits of contract work as required to maintain their health during course of construction operations.
- F. Provide protection for roots over 1 1/2 inch diameter that are cut during construction operations. Coat cut faces with an emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.
- G. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in a manner acceptable to Engineer. Employ a licensed arborist to repair damages to trees and shrubs.
- H. Replace trees which cannot be repaired and restored to full-growth status, as determined by arborist.

## PART 2 - PRODUCTS

Not applicable to this Section.

## PART 3 - EXECUTION

### 3.01 SITE CLEARING

- A. General. Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions as required to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. "Removal" includes digging out and off-site disposing of stumps and roots. The cost for site clearing is incidental to the unit price cost of installing line work.
- B. Cut minor roots and branches of trees indicated to remain in a clean and careful manner, where such roots and branches obstruct installation of new construction.
- C. Topsoil. Topsoil is defined as friable clay loam surface soil found in a depth of not less than four (4) inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over two (2) inches in diameter, and without weeds, roots, and other objectionable material.
- D. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.

Remove heavy growths of grass from areas before stripping.

Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.

- E. Stockpile topsoil in storage piles in areas indicated or directed. Construct storage piles to provide free drainage of surface water. Cover storage piles, if required, to prevent wind erosion.
- F. Dispose of unsuitable or excess topsoil same as specified for disposal of waste material.
- G. Clearing and Grubbing. Clear site of trees, shrubs, and other vegetation, except for those indicated to be left standing.
- H. Completely remove stumps, roots, and other debris protruding through ground surface.
- I. Use only hand methods for grubbing inside drip line of trees indicated to remain.
- J. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

Place fill material in horizontal layers not exceeding six (6) inches loose depth, and thoroughly compact to a density equal to adjacent original ground.

### 3.02 DISPOSAL OF WASTE MATERIALS

- A. Burning on Owner's Property. Burning is not permitted on Owner's property.
- B. Removal from Owner's Property. Remove waste materials from Owner's property.

END OF SECTION

## SECTION 02220

### EARTHWORK GENERAL

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. Work included: Excavate, backfill, compact, and grade the site to the elevations shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents. All excavation shall comply also with Kentucky OSHA 29 CFR Part 1926, Subpart P. Failure to comply with Subpart P will justify the issuance of a stop work order by the Owner.
- B. Related work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### 1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the soil engineer.

#### PART 2 - PRODUCTS

##### 2.01 SOIL MATERIALS

- A. Fill and backfill materials:
  - 1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-3/8" in their greatest dimension.
  - 2. Fill material is subject to the approval of the soil engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soils free from roots and other deleterious matter.
  - 3. Provide fill material free of rocks having a dimension greater than 1" in the upper 12" of fill or embankment.

2.02 TOPSOIL

- A. Where and if shown on the Drawings or otherwise required, provide topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonably free from subsoil, roots, heavy or stiff clay, stones, noxious weeds, sticks, brush, litter, and other deleterious matter.
- B. Obtain topsoil from sources within the project limits, or provide imported topsoil obtained from approved sources outside the project limits, or from both sources.

2.03 SELECT BACKFILL

- A. Use select backfill only as directed by the Engineer or as shown on the drawings.
- B. Materials utilized for select fill shall be subject to the Engineer's approval. Provide select fill meeting the following requirements:
  - 1. Compacted Limestone. Provide and place limestone dense graded aggregate conforming to Section 805 of the Kentucky Department of Highways Standard Specifications.
- C. Payment will be made to the Contractor for the amount of select fill installed at the field engineer's request. Payment will not be made to the Contractor for select fill utilized in the replacement of defective work.

2.04 80 PSI FLOWABLE FILL CONCRETE

- A. General. Provide flowable fill meeting the requirements specified in the following sections of the Kentucky Highway Department's current Standard Specifications for Road and Bridge Construction:

Portland Cement, Type I, Section 801  
Sand, Section 804  
Fly Ash, Class F, Section 844  
Water, Section 803

Unless otherwise approved by the Engineer, proportion flowable fill as follows, per cubic meter (cubic yard):

Cement, 14 kg (30 lbs.)  
Fly Ash, Class F, 136 kg (300 lbs.)  
Sand (S.S.D.), 1360 kg (3000 lbs.)  
Water (Maximum), 250 kg (550 lbs).

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.02 PROCEDURES

#### A. Utilities:

1. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.
2. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

#### B. Placing Flowable Fill Concrete:

Unless otherwise approved by the Engineer, deliver flowable fill in revolving drum truck mixers in accordance with Section 601 of the Kentucky Highway Department's current Standard Specifications for Road and Bridge Construction to ensure that the mixture is in suspension when placed. Agitation will be required during transportation and waiting time. Subsidence may occur if the mixer is not agitated. Place flowable fill by discharging directly from truck chutes into the trench or by means of conveyors, buckets or pumps.

Place flowable fill a minimum of eight (8) hours prior to the addition and compaction of any material above it unless other wise directed by the Engineer.

Unless otherwise indicated on the Drawings or in these Specifications, or unless otherwise directed by the Owner or Engineer, do not place flowable fill concrete directly on or around buried pipes. Any newly installed or existing pipelines located in a trench or other excavation to be backfilled with flowable fill concrete is to be bedded in granular material in keeping with the Drawing details from four (4) inches below to twelve (12) inches above the pipe for the entire trench width before placement of the flowable fill concrete.

- C. Protection of persons and property:
  - 1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
  - 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
  - 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.
- D. Dewatering:
  - 1. Remove all water, including rain water, encountered during construction to an approved location by pumps, drains, and other approved methods.
  - 2. Keep excavations and site construction area free from water.
- E. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- F. Maintain access to adjacent areas at all times.

### 3.03 TRENCH EXCAVATION

- A. General. Excavate trenches in open cut, by a trencher or backhoe of sufficient depth and width to meet the requirements of the installation section of these specifications. Provide no abrupt changes in grade of the main.
- B. Trenching Operations. Conduct the excavation in such a manner as to cause the least interruption or hazard to traffic. Exercise caution to avoid damage to surfaced roadways and repair any such damage to an equal of its original condition. Restore drainage structures damaged during the work, or obstructed by operations, to satisfactory condition as soon as possible. Where traffic must cross open trenches, provide suitable bridges and flagmen.
- C. Line Excavation. Make the excavation so that the entire length of the main shall lie upon the bottom of the trench. Excavation around all connections shall be of sufficient size to admit a free access for making the required connection. Where noted on the Plans or required for construction, remove excavated material from the trench by loading directly into a truck, and hauling to a predetermined dump site not located within the realm of the project.
- D. Length. Do not advance the excavation of the trench more than fifty (50) feet ahead of the pipe work, except where it is necessary to drain wet ground. The Contractor must assume the risk of meeting water, quicksand, hardpan, boulder clay, and existing utility lines.
- E. Excavated Material. Store excavated materials to be used as backfill in a neat pile

adjacent to the excavation, where possible. Do not endanger the work, traffic, or obstruct drainage unnecessarily. Remove excavated materials not suitable for backfilling, or surplus backfill and suitably dispose of within a twenty-four (24) hour period. Where noted on the Plans or required for construction, remove excavated material from the trench, load directly into a truck, and haul to a predetermined dump site not located within the realm of the project.

- F. Open Trench. Do not open more than one hundred (100) linear feet of trench at any one time, including sections partially backfilled and being tested.
- G. Ditch Protection. To prevent caving or to protect existing roadways, utilities, or structures, sheet or brace the trench as necessary. Sheeting, where required, shall remain in place until the pipe has been laid and tested. Where sheeting is place, the earth above the pipe shall be well tamped for a depth of at least six (6) inches above the pipe barrel.
- H. Dewatering. Keep trenches and other excavations adequately dewatered. Place discharge from pumps, drains, or bailing in such a way as to not introduce turbidity, sediments, or other pollutants into ditches, storm drains or natural drainage ways.
- I. Trench Bottoms. Follow uniform grades. Trench dimensions shall conform to the typical details of the plans, with additional excavation at the couplings to allow full pipe bearing.
- J. Pipe Bearing Surface. Dress the trench so that the barrel of the pipe bears evenly for its full length. Dig bell holes at each joint, dimensions of the holes to be sufficient to permit proper jointing.

Do not lay pipe resting on rock, blocking, or other unyielding objects. Where the trench bottom uncovered at subgrade is rock, cut the trench and lay the pipe on an evenly spread and compacted cushion. The cushion shall be at least four (4) inches and not more than eight (8) inches in depth above bottom of trench and shall uniformly support the barrel of the pipe. Construct the cushion from material indicted for use as pipe bedding.

Where the trench bottom is soft and in the opinion of the Engineer, cannot support the pipe, cut the trench as directed and install a suitable cradle. In general, the cradle shall be of pit run sand and gravel, or of small crushed stone or chips.

### 3.04 FILLING AND BACKFILLING

- A. General:
  - 1. For each classification listed below, place acceptable soil material in layers to required subgrade elevations.
  - 2. In excavations: Use satisfactory excavated or borrow material.
  - 3. Under roadway pavements: Use flowable fill as noted on drawings, unless noted otherwise
  - 4. Under drives/parking: Use compacted select backfill.

- B. Backfill excavations as promptly as progress of the Work permits, but not until completion of the following:
1. Acceptance of construction below finish grade including, where applicable, dampproofing and waterproofing.
  2. Inspecting, testing, approving, and recording locations of underground utilities.
  3. Removing concrete formwork.
  4. Removing shoring and bracing, and backfilling of voids with satisfactory materials.
  5. Removing trash and debris.
  6. Placement of horizontal bracing on horizontally supported walls.
- C. Ground surface preparation:
1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious matter from ground surface prior to placement of fills.
  2. Plow, strip, or break up sloped surfaces steeper than one vertical to four horizontal so that fill material will bond with existing surface.
  3. When existing ground surface has a density less than that specified under "compacting" for the particular area, break up the ground surface, pulverize, moisture condition to the optimum moisture content, and compact to required depth and percentage of maximum density.
- D. Placing and compacting:
1. Place backfill and fill materials in layers not more than 8" in loose depth.
  2. Before compacting, moisten or aerate each layer as necessary to provide the optimum moisture content.
  3. Compact each layer to required percentage of maximum density for area.
  4. Do not place backfill or fill material on surfaces that are muddy, frozen, or containing frost or ice.
  5. Place backfill and fill materials evenly adjacent to structures, to required elevations.
  6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.

7. Where the construction includes basement or other underground walls having structural floors over them, do not backfill such walls until the structural floors are in place and have attained sufficient strength to support the walls.

### 3.05 GRADING

#### A. General:

1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
2. Smooth the finished surfaces within specified tolerance.
3. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
4. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately 8'0", unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

#### B. Grading outside building lines:

1. Grade areas adjacent to buildings to achieve drainage away from the structures, and to prevent ponding.
2. Finish the surfaces to be free from irregular surface changes, and:
  - a. Shape the surface of areas scheduled to be under walks to line, grade, and cross-section, with finished surface not more than 0.10 ft above or below the required subgrade elevation.
  - b. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.05 ft above or below the required subgrade elevation.

### 3.06 COMPACTING

- A. Control soil compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D698.
- B. Provide not less than the following maximum density of soil material compacted at plus or minus 2% of optimum moisture content for the actual density of each layer of soil material in place, and as approved by the Engineer.
  1. Structures: Compact each layer of fill material or backfill material at 95% of maximum density.
  2. Lawn and Unpaved Areas: Compact each layer of fill material or backfill material at 90% of maximum density.

3. Walks: Compact each layer of fill material or backfill material at 92% of maximum density or the minimum percent of maximum density as required by the governmental agency having jurisdiction over the work, whichever is more stringent.
4. Pavements: Compact each layer of fill material or backfill material at 95% of maximum density or the minimum percent of maximum density as required by the governmental agency having jurisdiction over the work, whichever is more stringent.

C. Moisture control:

1. Where layer of soil material must be moisture-conditioned before compacting, uniformly apply water to layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture density relation tests approved by the Engineer.

3.07 FIELD QUALITY CONTROL

- A. Secure the Engineer's inspection and approval of fill layers before subsequent construction is permitted thereon.

Density testing will be required on all fill layers located under structures and paved surfaces or as directed by the Engineer. All testing shall be in accordance with ASTM D2922.

- B. At the expense of the Contractor, the Contractor shall be responsible for providing at least the following tests to the approval of the Engineer:

1. At structures, at least one field density test for every 1,000 square feet of area, but not less than three tests (each lift).
2. At paved areas, at least one field density test for every 2000 sq ft of paved area, but not less than three tests.
3. In each compacted fill layer, one field density test for every 2000 sq ft of overlaying paved area, but not less than three tests.

- C. If, in the Engineer's opinion based on reports of the testing laboratory, subgrade or fills which have been placed are below specified density, provide additional compacting and testing under the provisions of these Specifications.

3.08 MAINTENANCE

- A. Protection of newly graded areas:
  - 1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds;
  - 2. Repair and reestablish grades in settled, eroded, and rutted areas to the specified tolerances.
  
- B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

END OF SECTION

## SECTION 02221

### EARTHWORK - UNDERGROUND UTILITIES

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. Work included: Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the Work.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02220: Earthwork - General.

##### 1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.

#### PART 2 - PRODUCTS

- 2.01 See Section 02220 Subpart 2.01 of this Specification.

##### 2.02 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

#### PART 3 - EXECUTION

##### 3.01 SURFACE CONDITIONS

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FINISH ELEVATIONS AND LINES

Shall be as shown on drawings.

3.03 PROCEDURES

See Section 02220 Subpart 3.04 of this Specification.

3.04 TRENCHING

- A. Comply with pertinent provisions of Section 02220, and the provisions of this Section.
- B. Provide sheeting and shoring necessary for protection of the Work and for the safety of personnel.
  - 1. Prior to backfilling, remove all sheeting.
  - 2. Do not permit sheeting to remain in the trenches except when, in the opinion of the Engineer, field conditions or the type of sheeting or methods of construction such as use of concrete bedding are such as to make removal of sheeting impracticable. In such cases, the Engineer may permit portions of sheeting to be cut off and remain in the trench.
- C. Open cut:
  - 1. Excavate for utilities by open cut.
  - 2. If conditions at the site prevent such open cut, and if approved by the Engineer, trenching may be used.
  - 3. Short sections of a trench may be tunneled if, in the opinion of the Engineer, the conductor can be installed safely and backfill can be compacted properly into such tunnel.
  - 4. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects as directed by the Engineer.
  - 5. When the void is below the subgrade for the utility bedding, use suitable earth materials and compact to the relative density directed by the Engineer, but in no case to a relative density less than 90%.
  - 6. When the void is in the side of the utility trench or open cut, use suitable earth or sand compacted or consolidated as approved by the Engineer, but in no case to a relative density less than 80%.
  - 7. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the Owner.

8. Excavating for appurtenances:

- a. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.
- b. Overdepth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete as directed by the Engineer, and at no additional cost to the Owner.

D. Trench to the minimum width necessary for proper installation of the utility, with sides as nearly vertical as possible. Accurately grade the bottom to provide uniform bearing for the utility.

E. Depressions:

1. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing for the pipe on prepared bottom of the trench.
2. Except where rock is encountered, do not excavate below the depth indicated or specified.
3. Where rock is encountered, excavate rock to a minimum overdepth of 4" below the trench depth indicated or specified.

F. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.

G. Cover:

Provide minimum trench depth indicated on the standard details in the drawings or as directed by the Engineer.

3.05 BEDDING

Provide bedding as indicated on the Drawings.

3.06 BACKFILLING

A. General:

1. Except as otherwise specified or directed for special conditions, backfill trenches to the ground surface with material approved by the Engineer.
3. Reopen trenches which have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified, or otherwise correct to the approval of the Engineer.

4. Do not allow or cause any of the Work performed or installed to be covered up or enclosed by work of this Section prior to required inspections, tests, and approvals.
5. Should any of the Work be so enclosed or covered up before it has been approved, uncover all such Work and, after approvals have been made, refill and compact as specified, all at no additional cost to the Owner.

B. Lower portion of trench:

1. Deposit approved backfill and bedding material in layers of 6" maximum thickness, and compact with suitable tampers to the density of the adjacent soil, or grade as specified herein, until there is a cover of not less than 24" over utility lines. Compact under piping haunches by hand methods, where applicable.
2. Take special care in backfilling and bedding operations to not damage pipe and pipe coatings.

C. Remainder of trench:

1. Except for special materials for pavements, backfill the remainder of the trench with material free from stones larger than 6" or ½ the layered thickness, whichever is smaller, in any dimension.
2. Deposit backfill material in layers not exceeding the thickness specified, and compact each layer to the minimum density directed by the Engineer.

D. Adjacent to buildings: Mechanically compact backfill within ten feet of buildings.

3.07 DRILLING

- A. General. All drilling under the highway, blacktop roads, drives, walks, signs, parking areas and any other locations designated by the Engineer, shall be performed by a traditional rotary drill with guide tracks or with the prior approved use of direction drilling technology and shall be drilled large enough to accommodate the respective pipe including bells, joints, couplings, etc., to the satisfaction of the Engineer.
- B. Right-of-Way Crossing. The crossing described above shall be made in accordance with the requirements and regulations of the authority under whose right-of-way the crossing is being made and in accordance with the details shown on the Drawings.
- C. Crossing Permits. The Contractor shall maintain copies of all permits on site at all times and adhere to provisions specified within the permit document.
- D. Service Crossing. The customer service line to the meter boxes shall be drilled under the existing highway or blacktop surface in a manner not to destroy any of the existing surface.
- E. Existing streets and driveways damaged by excavation shall be restored to their

original condition.

- F. Driveways, as excavated for the water main, shall be replaced within twenty-four (24) hours; however, accessibility to the property shall not be impeded beyond the end of a regular working day. Approved steel bridging material and/or backfilling shall be used to provide a smooth and safe access to said property. Provide property owner notifications a minimum of 48 hours prior to excavating driveways.
- G. RAILROAD

END OF SECTION

## SECTION 02490

### LANDSCAPING AND SEEDING

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. Work included: Provide lime, fertilizer, seed, and mulch as specified herein, and needed for a complete and proper installation.
- B. Related work:
  - 1. Section 02220: Earthwork General.

##### 1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
  - 1. Seeding Material: Meet or exceed the specifications of the Kentucky Seed Improvements Association.

##### 1.03 SUBMITTALS

- A. Submit six (6) copies of product data sheets on material to be used.
- B. Product data: Within 14 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Complete materials list of items proposed to be provided under this Section.
  - 2. Sufficient data to demonstrate compliance with the specified requirements.

#### PART 2 - PRODUCTS

##### 2.01 FERTILIZER

Provide commercial balanced 10-10-10 fertilizer delivered to the site in bags labeled with the manufacturer's guaranteed analysis. Uniformly apply 1,000 pounds per acre of premium fertilizer prior to seeding.

2.02 SOIL AMENDMENT

Provide agricultural limestone. Uniformly apply two (2) tons of agricultural limestone per acre immediately prior to seedbed preparation.

2.03 MULCH

Provide wheat and rye straw. Uniformly apply two (2) tons per acre immediately subsequent to seeding.

2.04 GRASS SEED

A. General: Provide Kentucky 31 Fescue seed which is:

1. Free from noxious weed seeds, and recleaned;
2. Grade A recent crop seed;
3. Treated with appropriate fungicide at time of mixing; and
4. Delivered to the site in sealed containers with dealer's guaranteed analysis.

B. Uniformly apply three hundred (300) pounds per acre immediately following the application of the lime and fertilizer.

C. In the event that seeding is performed between October 15th and March 31st, uniformly apply one hundred (100) pounds per acre of annual rye in addition to the above-mentioned three hundred (300) pounds per acre of Kentucky 31 Fescue.

2.05 PLANT MATERIALS

Provide the plant materials called out on the Drawings.

2.06 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.02 SOWING TURF GRASS

#### A. Stage 1: Initial Dressing.

1. Definition. Initial dressing consists of backfilling, compacting (if required), and mounding the excavated material over the utility trench. Rake the remaining construction path free of earth, debris, pipe, etc., except within a section limited to two feet (2') either side of the trench. Mound earth to a height not to exceed three feet (3').
2. Scheduling. Do not lay utility lines more than three hundred feet (300') ahead of the Stage 1 dressing area unless prior approval is obtained from the field engineer, and in no case shall construction areas remain undressed for more than three (3) days.

#### B. Stage 2: Final Dressing.

1. Definition. Final dressing consists of grading all disturbed areas within the scope of the project to their specified elevations and slopes, raking and disposing of rocks, clods, and debris from the Stage 1 dressing areas, seeding, liming, fertilizing, and mulching the Stage 1 dressing areas to the satisfaction of the Owner and Engineer.
2. Preparation of Seed Bed. Where the area to be seeded is not sufficiently pulverized to provide good seed bed, the seed bed shall be prepared by pulverizing the soil to a minimum depth of two inches (2") with a disk harrow, drag harrow, spike tooth or similar tool, immediately prior to seeding. All clods, rocks and undesirable material that would interfere with seeding operations shall be removed.
3. Scheduling. Upon completion of the underground work as described in these Contract Documents and as shown on the Drawings, perform the Stage 2 final dressing. In the event that the Contractor is unable to re-enter the Stage 1 areas due to adverse weather conditions, the Contractor shall request a time extension in writing to the Engineer. After approval from the Engineer and the Owner, leave the project and return at the earliest practical time to complete final dressing.

### 3.03 INSPECTION

- A. In addition to normal progress observations, schedule and conduct the following formal inspections, giving the Engineer at least 24 hours

advance notice of readiness for inspection:

1. Final inspection after completion of sowing:

Schedule this inspection sufficiently in advance, and in cooperation with the Engineer in order that final inspection may be conducted within 24 hours after completion of sowing.

2. Final inspection at the end of the maintenance period, provided that previous deficiencies have been corrected.

3.04 MAINTENANCE

A. Maintain planting, starting with the planting operations and continuing for 30 calendar days after planting is complete and approved by the Engineer.

B. Work included:

1. Watering, weeding, cultivating, spraying, and pruning necessary to keep the plant materials in a healthy growing condition and to keep the planted areas neat and attractive throughout the maintenance period.

2. Provide equipment and means for proper application of water to those planted areas not equipped with an irrigation system.

3. Protect planted areas against damage, including erosion and trespassing, by providing and maintaining proper safeguards.

C. Replacements:

1. At the end of the maintenance period, all plant material shall be in a healthy growing condition.

2. During the maintenance period, should the appearance of any planted area indicate weakness and probability of dying, immediately resow that area without additional cost to the Owner.

D. Extension of maintenance period:

Continue the maintenance period at no additional cost to the Owner until previously noted deficiencies have been corrected, at which time the final inspection will be made.

## PART 4 - PAYMENT

### 4.01 Landscaping and Seeding Pay Limits.

The pay limits for landscaping and seeding shall be limited to ten feet (10') either side of the installed utility lines for a total width of twenty feet (20'). Landscape and seed all areas outside the pay limits in accordance with the provisions of this section. Consider landscaping and seeding work outside of the designated pay limits incidental to the contract. Do not include the additional landscaping and seeding work in the pay quantity for landscaping and seeding. No payment shall be made for landscaping and seeding until Stage 2 dressing is complete to the satisfaction of the Owner and the Engineer.

END OF SECTION

## SECTION 02505

### DENSE GRADED AGGREGATE & CRUSHED STONE BASE

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

This work includes the compaction and installation requirements of Dense Graded Aggregate or Crushed Stone Base as a subbase for driveways and cast-in-place structural concrete.

##### A. Definitions.

1. Dense Graded Aggregate (DGA): DGA shall consist of premixed base materials of crushed stone binder material and water and shall be compacted on an existing subgrade to a finished thickness in areas specified on the drawings.

2. Crushed Stone Base (CSB): CSB shall consist of premixed base materials of crushed stone binder material and water and shall be compacted on an existing subgrade to a finished thickness in areas specified on the drawings.

##### B. Related Work.

Section 02220, Structural Excavations and Backfill.

Section 02221, Earthwork - Underground Utilities.

##### 1.02 REFERENCES

A. Kentucky Department of Highways (KDOH) Standard Specification for Road and Bridge Construction, latest edition.

B. American Society of Testing and Materials (ASTM) Annual Book of Standards.

C-128 Specific Gravity and Absorption of Fine Aggregate.

C-127 Specific Gravity and Absorption of Coarse Aggregate.

D-1241 Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Course.

D-2922 Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).

## PART 2 - PRODUCTS

### 2.01 MATERIALS

In accordance with Section 302, Paragraph 302.02 of the KDOH Specification, aggregate for use in DGA or CSB, shall be provided in accordance with Section 805, Paragraph 805.04.03(A) of the KDOH specification.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Verify the grades and elevations are correct.
- B. Verify the subgrade is not soft, spongy, or composed of otherwise unstable materials. If unstable materials are encountered, stop work and notify the Construction Engineer.

### 3.02 INSTALLATION/APPLICATION/ERECTION

- A. The method of construction and workmanship shall be in accordance with the Kentucky Department of Highways Standard Specification for Road and Bridge Construction, latest edition.
- B. When additional base material is to be added to existing DGA or CSB base, scarify the existing base to a depth of 3 in. Add new stabilized aggregate base material and thoroughly mix with the old material by blading and compaction continued as for new aggregate base.
- C. Maintain the finished base course in a condition satisfactory to the Construction Engineer until installation of concrete surfacing or final acceptance by the Construction Engineer. Repair or restore areas showing washes or looseness to the specified condition at no expense to the Owner.

### 3.03 FIELD QUALITY CONTROL

- A. Testing - Buildings:
  - 1. Compact each layer to an average dry density of not less than 95% of theoretical density based upon 84% of the solid volume. No individual test shall be less than 95% of the theoretical density. The density determination will be based on the bulk specific gravity in accordance with ASTM D-2922 or other ASTM in-place density test approved by the Construction Engineer. Maximum density determination and in-place density tests will be performed

by a certified testing lab. Costs associated with density testing shall be paid for by the Contractor.

2. The surface of the top layer shall not show any deviation in excess of 3/8 in. when tested with a 10-ft straight edge applied parallel to and at right angles to the center line of the paved area.

B. Testing - Other Areas:

1. Compact each layer to an average dry density of not less than 95% of theoretical density based upon 84% of the solid volume. No individual test shall be less than 95% of the theoretical density. The density determination will be based on the bulk specific gravity in accordance with ASTM D-2922 or other ASTM in-place density test approved by the Construction Engineer. Maximum density determinations and in-place density tests will be performed by the Contractor.
2. The surface of the top layer shall not show any deviation in excess of 3/8 in. when tested with a 10-ft straight edge applied parallel to and at right angles to the center line of the paved area.

END OF SECTION

## SECTION 02713

### WATER DISTRIBUTION SYSTEM

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION

- A. Work included – Provide treated water distribution system as shown on the Drawings, specified herein, and needed for a complete and proper installation.
- B. Related Work – Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections, in Division 1 of these Specifications (as applicable).

1.02 QUALITY ASSURANCE – Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

##### 1.03 SUBMITTALS

- A. Submit six (6) copies of product data sheets on material to be used.
- B. Product Data
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
  - 3. Names and addresses of the nearest service and maintenance organization that readily stocks repair parts;
  - 4. Manufacturer's recommended installation procedures which, when approved by the Engineer, will become the basis for accepting or rejecting actual installation procedures used on the Work.

#### PART 2 – PRODUCTS

##### 2.01 PIPE, FITTINGS, AND ACCESSORIES

- A. General – Provide pipe, fittings, and accessories complying with the following requirements:
- B. Pipe
  - 1. DIP (Ductile Iron Pipe)
    - (a) Ductile iron push on joint  
Comply with ANSI A-21.11 (AWWA C111).
    - (b) Ductile iron flanged joint  
Comply with either ANSI A-21.15 (AWWA C115) with a 125 pound flanged joint or ANSI B-16.1 - ANSI B16.5 with a 125 pound cast iron "Uni-Flange" adapter as manufactured by Uni-Flange Corporation.
  - 2. PVC (Polyvinyl Chloride) Pipe
    - (a) Use rigid unplasticized polyvinyl chloride (PVC) complying with ASTM D1784 and D2241. The PVC compound used in the manufacture of this pipe shall meet or exceed the requirements for class 12454-A or 12454-B

as defined by ASTM D1784. Provide pipe with a standard dimension ratio (SDR) of 21 with pressure rating of 200 psi complying with ASTM D2241. Provide an NSF approved pipe for potable water service.

- (b) In addition, Pipe shall be tested and inspected at the factory. Testing shall be accomplished in conformance with the following ASTM specifications utilizing the test methods specified therein:

Dimensions	ASTM D 3034-81 or ASTM F679-80 and D 2122-81
Extrusion Quality	ASTM D 2152-80
Pipe Stiffness (5%)	ASTM D 2412-77
Impact Resistance	ASTM D 2444-80

3. HDPE (High Density Polyethylene) Pipe – Use HDPE with a standard dimension ratio (DR) of 11 with a working pressure rating of 160 psi and conforming to ASTM F714 and D3035. The pipe shall be sized with standard iron pipe size (IPS) and shall be DriscoPlex 4100 or approved equal.
4. Restrained-Joint PVC Pipe – Use Certa-Lok C900/RJ PVC pipe with a working pressure rating of 200 psi (DR 14) as manufactured by Certain Teed Pipe and Plastics Group or approved equal.
5. Fusible PVC Pipe – Shall be 200 psi (SDR 21) FPVC (Fusible PVC) as manufactured by Underground Solutions, INC or engineer approved equal.

C. Joints

1. DI (Ductile Iron) Push-On-Joint – Comply with ANSI A-21.11 (AWWA C111)
2. DI (Ductile Iron) Flanged Joint – Comply with either ANSI A-21.15 (AWWA C115) with a 125-lb flanged joint or ANSI B-16.1 - ANSI B16.5 with a 125-lb cast iron "Uni-Flange" adapter as manufactured by Uni-Flange Corporation.
3. PVC (Polyvinyl-Chloride) Joint
  - (a) Provide a push on type joint with a continuous elastomeric ring gasket compressed into the annular space between bell and spigot end of pipe complying with ASTM D3139.
  - (b) A typical joint assembly shall be tested by a qualified independent laboratory per test requirements of ASTM D3212-81. The manufacturer shall submit to the Engineer sufficient copies of certification and test results by shipment to the job site that will permit the Owner to retain two copies.
  - (c) Fusible PVC joints shall be formed in accordance with the manufacture's specifications.
4. HDPE (High Density Polyethylene) Joint – Form joints by heat fusion method in accordance with the manufacturer's recommendations and ASTM D3261.

D. Fittings

1. Use mechanical joint fittings for all exterior below grade pressure piping complying with AWWA C153.
2. Use cement lining complying with ANSI A-21.4 (AWWA C104) with a bituminous seal coat.
3. All fittings must be manufactured in the United States of America unless

otherwise approved by the Engineer.

4. Double wrap all fittings with 8-mil polyethylene wrap prior to placing concrete thrust blocking. Tape polyethylene wrapping around pipe barrels to provide a water tight seal around the fittings. Costs for poly-wrap shall be considered incidental to the cost of fittings.
5. HDPE Fittings – Use HDPE fittings conforming to AWWA C906 requirements. Provide mechanical joint adapter kits at transition points to other pipe types.

E. Valves

1. Gate Valves
  - (a) Provide gate valves in accordance with Section 15110 of these specifications.
  - (b) Provide connections as required for the piping in which they are installed.
  - (c) Provide all exterior below grade valves with standard operating nut and all interior valves with handwheels. Provide two (2) tee handle socket operating wrenches of suitable size and length.
  - (d) Provide below grade valves with valve boxes of the screw type adjustable pattern with a lid marked water as described in E.4 below.
  - (e) Valves 3" and smaller
    - (1) Provide all bronze, screwed, single wedge disc, screw in bonnet, packing gland, and nut, with a non-rising stem.
    - (2) Provide below grade valves with a suitable precast concrete box with a lid marked water.
2. Butterfly Valves
  - (a) With the exception of tapping valves, all valves 16" and larger shall be butterfly valves unless otherwise noted on the drawings.
  - (b) Provide butterfly valves in accordance with Section 15110 of these specifications.
3. Tapping Valves – Use tapping valves meeting the general operating and material requirements of Section E.1. of this specification. Use Mueller RWGV tapping valve, or approved equal.
4. Valve Boxes
  - (a) For butterfly valves, use cast iron, slip type adjustable pattern, similar and equal to Bingham & Taylor or Utility Pipe Model CVB562. For gate valves, use cast iron screw type adjustable pattern, similar and equal to Bingham & Taylor 4905.
  - (b) The boxes shall have a lid marked "water" similar and equal to Bingham & Taylor 4905-L1.5.
  - (c) The valve boxes shall be of sufficient length to permit the valve to set at the depth indicated by required cover on the pipe shown on the Drawings. Provide cast iron valve box extensions, as necessary, similar or equal to Bingham & Taylor 4905-X.
  - (d) Provide valve stem extensions on all water lines greater than 6 feet deep. Valve stem extensions shall be similar or equal to Bingham & Taylor 5051.

- F. Restraint Joint Gaskets – Use restrained joint gaskets in all DIP installation within steel encasement. In addition, use restrained joint gaskets in all pipe joints within creek crossings and roadway crossings and within one DIP pipe joint connection either side of steel encasement. Use "Field Lok" gaskets as manufactured by U.S. Pipe and Foundry Company.
- G. Thrust Restraint Glands for Ductile Iron Pipe – Use thrust restraint glands ensuring 360° contact between the gland and the pipe wall. Uni-Flange Series 1300 joint restraint devices as manufactured by Ford Meter Box Company, Inc. or approved other. Use thrust restraint glands on each mechanical joint connection 6" in diameter and larger.
- H. Thrust Restraint Glands for PVC Pipe – Use thrust restraint glands ensuring 360° contacts between the gland and the pipe wall. Use Uni-flange Series 1300 joint restraint devices as manufactured by Ford Meter Box Company, Inc. or approved other. Use thrust restraint glands for PVC pipe on each mechanical joint connection 6" in diameter and larger.
- SO-EZ MJ Gland Snap-On Gaskets, as manufactured by Ford Meter Box Company, Inc. shall not be accepted for use on any mechanical joint piping or restraint.
- I. Joint Restraint Glands for PVC Pipe – Use joint restraint glands ensuring 360° contact between the gland and the pipe wall. Use Uni-Flange Series 1390 joint restraint devices as manufactured by Ford Meter Box Company, Inc., or approved other. Use joint restraint glands at field engineer's discretion or as shown on the Plans.
- J. Petroleum -Resistant Gaskets – Where noted on the drawings, provide petroleum-resistant gaskets for push-on and mechanical joint fittings. Petroleum-resistant gaskets shall be manufactured from Nitrile in accordance with AWWA C111.
- K. Stainless Steel All-thread Rods – Use 3/4" diameter stainless steel all-thread rods complying with ASTM Type 303 stainless steel. Use rods at field engineer's discretion or as shown on the Plans. Cost associated with contractor installation, equipment, materials, etc., is incidental to the cost for pipe.
- L. Service Saddles – Use service saddles as manufactured by Ford Meter Box Company with all service connections made on Ductile Iron, Cast Iron, PVC or asbestos cement pipe. Long side service saddles shall be Model FS202, or approved equal.
- M. Tapping Sleeves – Use stainless steel tapping sleeves as manufactured by Ford Meter Box Company or Romac Industries, Inc., Seattle, Washington, or approved equal. Tapping sleeves shall include a flanged outlet.
- N. Steel Casing Pipe – Use steel casing pipe conforming to ASTM A139. All encasement shall have a minimum yield strength of 35,000 psi and a minimum thickness of .25 inches for casing diameter of 16 inches and less, 0.312 inch thickness for casing diameters of 18, 20, and 22 inches, and 0.344 inch thickness for casing diameter of 24 inches. Coat the outside of all steel encasement pipe with either an epoxy or bituminous coating. Casing spacers and end seals are considered incidental to the unit price of the steel encasement.
- O. Fire Hydrants
1. General
    - (a) Use fire hydrants complying in all respects with the latest revision for AWWA C502. use fire hydrants with one (1) 4½" pumper nozzle with National Standard Thread and two (2) 2½" bronze hose nozzles with National Standard Thread. Secure all caps with long heavy chains. Use

hydrants with a one piece bronze operating nut to be opened in a counterclockwise direction. Use hydrants with a compression main valve, bronze seat ring with bronze seating. Bronze upper plate, high tensile steel stem, and O-ring seals. The inlet valve opening shall be 5¼" diameter with 6½" ID standpipe section and a 6" high strength cast iron inlet connection.

- (b) Use hydrants with replaceable, breakable sections, or components such that in the event the barrel is broken off, the valve will remain closed, the barrel will not be damaged, and the stem will not be bent.
  - (c) Furnish hydrants from the factory with one shop coat of yellow rust inhibitive primer with a minimum dry mil thickness of 1.5.
  - (d) Use Mueller Super Centurion 250, Kennedy, or approved other.
- 2. Hydrant Valves – Equip all 5¼" hydrants with 6" gate valves as shown on the drawings.
  - 3. Anchoring Tee – Use standard mechanical joint anchoring tees with a split ductile iron rotating gland on the branch. Use trim tyte ductile iron mechanical joint anchoring tees as manufactured by U.S. Pipe and Foundry Company, Birmingham, Alabama, or an approved equal.
  - 4. Hydrant Connecting Pieces – Use hydrant connecting pieces with integrally cast standard mechanical joint on one end and a split ductile iron rotating gland on the other. Use hydrant connecting pieces as manufactured by American Cast Iron Pipe Company, Birmingham, Alabama, No. A108954 or an approved equal.

P. Copper Pipe – Service Lines

- 1. Pipe – Unless otherwise indicated on the drawings, use Type "K" soft copper tubing complying with ASTM Specifications B 88 and AWWA Specification C800. Install service lines with a continuous run of pipe from the main to the meter where possible. For longer (bored) services, a continuous run of pipe shall be placed beneath all roadways.
- 2. Fittings – All fittings or unions for the copper service lines shall be of standard brass grip joint coupling connections as manufactured by Ford, or approved equal. Threads on fittings shall conform to AWWA C800, "Standard Threads for Underground Service Line Fittings."
- 3. Verification – Verify the size of existing service lines prior to installation of replacement or relocated service lines. Notify the Engineer prior to installation of any discrepancies between plan information and field verified information.

Q. Polyethylene Pipe – Service Lines

1. Pipe – Only as indicated on the drawings, use copper tubing size P.E. Municipal Service tubing complying with ASTM Specifications ASTM D2737. Install service lines with a continuous run of pipe from the main to the meter. All PE service lines shall be installed with a continuous run of tracer wire.
2. Fittings – All fittings or unions for the P.E. service lines shall be of standard brass type for pack joint connections. Threads on fittings shall conform to AWWA C800, "Standard Threads for Underground Service Line Fittings."
3. Verification – Verify the size of existing service lines prior to installation of replacement or relocated service lines. Notify the Engineer prior to installation of any discrepancies between plan information and field verified information.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS – Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FIELD MEASUREMENT – Make necessary measurements in the field to assure precise fit of items in accordance with the approved design.

3.03 HANDLING

- A. Handle pipe accessories so as to ensure delivery to the trench in sound, undamaged condition:
  1. Carry pipe into position; do not drag.
  2. Use pinch bars or tongs for aligning or turning the pipe only on the bare end of the pipe.
- B. Thoroughly clean interior of pipe and accessories before lowering pipe into trench. Keep clean during laying operations by plugging or other method approved by the Engineer.
- C. Before installation, inspect each piece of pipe and each fitting for defects: Material found to be defective before or after laying: Replace with sound material meeting the specified requirements, and without additional cost to the Owner.
- D. Store rubber gaskets in a cool dark place until just prior to time of installation.

3.04 PIPE CUTTING

- A. Cut pipe neatly and without damage to the pipe.
- B. Unless otherwise recommended by the pipe manufacturer, and authorized by the Engineer, cut pipe with mechanical cutter only.
  1. Use wheel cutters when practical.
  2. Cut plastic pipe square, and remove all burrs.

3.05 LOCATING

- A. Locate water line at least ten feet away, horizontally, and 18 inches, vertically, from sewer line.
- B. Do not place water lines in the same trench with sewer lines or electric wiring.
- C. Whenever it is necessary to deflect pipe from a straight line, either in the vertical or

horizontal plane, to avoid obstruction of plumb stems, or where long-radius curves are permitted, the amount of deflection allowed shall not exceed that required for satisfactory making of the joint and comply with the manufacturer's allowable units.

### 3.06 PLACING AND LAYING

#### A. General

1. Lower pipe and accessories into trench by means of derrick, ropes, belt slings, or other equipment approved by the Engineer.
2. Do not dump or drop pipe work materials into the trench.
3. Lay pipe with the bells facing in the direction of laying, except where necessary in making connections to other lines.
4. Rest the full length of each section of pipe solidly on the pipe bed, with recesses excavated to accommodate bells, couplings and joints.
5. Take up and relay pipe that has the grade or joint disturbed after laying.
6. Do not lay pipe in water, or when trench conditions are unsuitable for the work.
7. Securely close open ends of pipe, fittings, and valves when work is not in progress.
8. Where any part of coating or lining is damaged, repair to the approval of the Engineer and at no additional cost to the Owner.
9. All pipe laying shall be in strict accordance with manufacturers recommendations and installation manual unless otherwise specified.

### 3.07 JOINTING

#### A. Asbestos Cement Pipe

1. Install couplings in accordance with AWWA C603.
2. Install heavy couplings for service line connections in accordance with the recommendations of the manufacturer.

### 3.08 VALVES

- A. Location – Valves shall be located as shown on the Plans and approved by the Engineer.
- B. Valve Boxes and Valve Pits – A valve box 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 using a centering disk as manufactured by American Flow Control or approved equal. The valve box shall be flush with the surface of the finished pavement or such other level as may be directed.

### 3.09 THRUST BLOCKING

#### A. General

1. Provide thrust blocks on plugs, caps, tees, and bends deflecting 11-1/4° or more either vertically or horizontally.
2. Provide KDOH Class B concrete for thrust blocking.

#### B. Installation

1. Prepare trench well or other supporting earth surface by exposing firm undisturbed soil just prior to concrete placement.

2. Place thrust blocks as shown in the typical details with sufficient volume of concrete.
3. Sides of thrust blocking not subject to thrust may be placed against forms.
4. Place thrust blocking so the fitting joints will be accessible for repair.
5. Place polyethylene wrap around fittings, bolts, and glands to prevent exposure to concrete. Costs associated with providing and installing poly-wrap shall be considered incidental to the unit price for fittings.

### 3.10 INSPECTING

#### A. Pressure Piping

1. Closing uninspected work – Do not allow or cause any of the work of this Section to be covered up or enclosed until after it has been completely inspected and tested, and has been approved by the Engineer.

### 3.11 TESTING & DISINFECTION

#### A. Scope:

The Contractor shall furnish all materials, equipment, tools and labor necessary to perform all of the tests called for and required herein. The hydrostatic tests shall consist of a pressure test and leakage test. The Contractor may backfill the pipe at his discretion; however, if the pipe has to be repaired it shall be uncovered, repaired and backfilled at no expense to the Owner.

#### B. Pressure Tests:

1. General. After the trench has been backfilled as specified, all newly laid pipe, or any valved section thereof, shall be subjected to 150 psi pressure test under the supervision of the Engineer and the Owner.
2. Length of Test. The duration of each pressure test shall be two hours, after reaching 150 psi.
3. Procedure. Each valve section of the pipe shall be slowly filled with water and the specified test pressure applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe, connections, gauges and all necessary apparatus shall be furnished by the Contractor. The test connection shall be made at the highest point in the test section or provisions made for pressure differentials due to elevations. The test pressure may not vary  $\pm 2$  psi for the duration of the test. Provide pressure gauge with ability to read pressure in increments of 1 psi.
4. Expelling Air. Before applying the test pressure, all air shall be expelled from the pipe. If hydrants or blowoff valves are not available at high places, the Contractor shall make the necessary taps (requires service clamp and corporation stop) at points of highest elevation before the test is made with the approval of the Engineer. These taps shall be left in place and location marked.
5. Defects. Any cracked or defective pipes, fittings, valves or hydrants discovered in consequence of this pressure test shall be removed and replaced by the

Contractor with new material in the manner specified and the test shall be repeated until satisfactory to the Engineer.

C. Leakage Test:

1. General. A leakage test shall be conducted concurrently with the pressure test. The duration of each leakage test shall be two hours and during the test, the main shall be subject to 150 psi pressure.
2. Permissible Leakage. Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

No pipe installation will be accepted until the leakage is less than the number of gallons per hour as determined by the following schedule:

Allowable Leakage Per 1,000 Feet of Pipeline			
Pipe Size (Inches)	Maximum Loss (Gal./Hr.)	Test Pressure (PSI)	Test Period (Hours)
18	1.66	150	2
12	1.10	150	2
10	0.92	150	2
8	0.74	150	2
6	0.55	150	2

3. Procedure. Each end of the main shall be capped. The main shall then be filled slowly with water by means of a pump connected to the low end of the main. The pump shall be connected to the main in a manner satisfactory to the Engineer. Provisions shall be made at the high end of the main to expel all air from the line. After all air has been expelled from the main, the water pressure in the main shall then be increased gradually to 150 psi. After the pressure has stabilized to 150 psi the test shall begin. Water required to maintain 150 psi shall be withdrawn from a calibrated container. The outlet end of any pressure regulating device shall discharge into the calibrated container in order to accurately determine the actual amount of water required to maintain the required 150 psi water pressure within the test section.

Should any test of the pipe disclose leakage greater than that specified, the Contractor shall, at his own expense, repair the defective joints or sections until the leakage is within the specified allowance.

4. Final Acceptance. No pipe installation will be accepted until the leakage is less than the number of gallons per hour as specified in the above table for the size pipe being tested.

D. Disinfection:

1. All completed water mains, valves, tees, crosses, etc., shall be disinfected in

accordance with "AWWA Standard for Disinfecting Water Mains ANSI/AWWA C651-99" and in accordance with the following requirements:

2. The mains shall be thoroughly disinfected before being placed in service by the use of chlorine or chlorine compounds in such amount as to produce a concentration of at least 50 PPM and a residual of at least 25 PPM at the end of 24 hours.
3. The chlorine residual at the end of the 24 hour period will be verified by the Contractor in the presence of the Engineer and a representative of the County Health Department. If the chlorine residual in the main is less than 25 ppm, the main shall be disinfected again.
4. After the chlorine residual has been verified, the main shall be thoroughly flushed until the chlorine concentration is found to be at levels equal to levels within the surrounding water system. A water sample shall be taken at that time for a bacteria test to be performed by a state certified laboratory. The Contractor will be responsible for sampling and testing at his own expense.
5. All water used in disinfection shall be dechlorinated and approved by the Engineer or Owner's Representative prior to discharge to surface water or surrounding area.

END OF SECTION

## SECTION 02802

### HORIZONTAL DIRECTIONAL DRILLING

#### PART 1 - GENERAL

##### 1.01 SCOPE

Furnish all labor, materials, tools, and equipment as necessary to drill horizontally and install water service line piping as shown on the Plans and described herein.

##### 1.02 PROFILES AND TOPOGRAPHY

Contours, topography, and profiles of the ground shown on the Drawings are believed to be reasonably correct, but are not guaranteed to be absolutely so and are presented only as an approximation.

##### 1.03 UTILITIES

Before work is started, locate utilities and other subsurface structures which may be affected by or interfere with the proposed construction.

##### 1.04 QUALITY ASSURANCE

- A. All directional drilling operations shall be done by a qualified directional drilling CONTRACTOR with at least (5) years experience involving work of a similar nature to the work required of this project. The rig operator shall have at least 3 years experience with similar projects.
- B. Notify ENGINEER and OWNER a minimum of three (3) days in advance of the start of work.
- C. All work shall be performed in the presence of the OWNER or ENGINEER.

#### PART 2 - PRODUCTS

##### 2.01 COPPER PIPE – SERVICE LINES

- A. Pipe – Unless otherwise indicated on the drawings, use Type "K" soft copper tubing complying with ASTM Specifications B 88 and AWWA Specification C800. Install service lines with a continuous run of pipe from the main to the meter where possible. For longer (bored) services, a continuous run of pipe shall be placed beneath all roadways.
- B. Fittings – All fittings or unions for the copper service lines shall be of standard brass grip joint coupling connections as manufactured by Ford, or approved equal. Threads on fittings shall conform to AWWA C800, "Standard Threads for Underground Service Line Fittings."
- C. Verification – Verify the size of existing service lines prior to installation of replacement or relocated service lines. Notify the Engineer prior to installation of

any discrepancies between plan information and field verified information.

## 2.02 DIRECTIONAL DRILLING EQUIPMENT REQUIREMENTS

- A. General: The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pull back the pipe, a drilling fluid mixing, delivery and recovery system of sufficient capacity to successfully complete the installation a drilling fluid recycling system to remove solids from the drilling fluid so that the fluid can be reused (if required), a magnetic guidance system or walk-over system to accurately guide boring operations, a vacuum truck of sufficient capacity to handle the drilling fluid volume, and trained and competent personnel to operate the system. All equipment shall be in good, safe condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.
- B. Drilling Rig: The directional drilling machine shall consist of a hydraulically powered system to rotate and push hollow drilling pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the installation. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations. There shall be a system to detect electrical current from the drill string and an audible alarm which automatically sounds when an electrical current is detected.
- C. Drill Head: The drill head shall be steerable by changing its rotation, and shall provide necessary cutting surfaces and drilling fluid jets.
- D. Mud Motors (if required): Mud motors shall be of adequate power to turn the required drilling tools.
- E. Drill Pipe: Shall be constructed of high quality 4130 seamless tubing, grade D or better, with threaded box and pins. Tool joints should be hardened to 32-36 RC.

## 2.03 GUIDANCE SYSTEM

- A. General: An electronic walkover tracking system or magnetic Guidance System (MGS) probe or proven gyroscopic probe and interface shall be used to provide a continuous and accurate determination of the location of the drill head during the drilling operation. The guidance shall be capable of tracking at all depths up to fifty feet in any condition, including water and hard rock. It shall enable the driller to guide the drill head by providing immediate information on the tool face, azimuth (horizontal direction), and inclination (vertical direction). The guidance system shall be accurate and calibrated to manufacturer's specifications of the vertical depth of the borehole at sensing position at depths up to fifty feet and accurate to 2-feet horizontally.
- B. Components: The CONTRACTOR shall supply all components and materials to install, operate and maintain the guidance system.
- C. The guidance system shall be of a proven type, and shall be set up and operated by

personnel trained and experienced with the system. The operator shall be aware of any geo-magnetic anomalies and shall consider such influences in the operation of the guidance system.

#### 2.04 OTHER EQUIPMENT

- A. Pipe Rollers: pipe rollers or other method shall be used for pipe assembly during final product pull back where the pipe will be in contact with pavement, gravel or otherwise directed by the ENGINEER.
- B. Restrictions: Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the ENGINEER prior to commencement of the work. Consideration for approval will be made on an individual basis for each specified location. The proposed device or system shall maintain line and grade within the tolerances prescribed by the particular conditions of the project.
- C. A berm, minimum of 12-inches high, shall be maintained around drill rigs drilling fluid mixing system, entry and exit pits and drilling fluid recycling system to prevent spills into the surrounding environment. Pumps and or vacuum truck(s) of sufficient size shall be in place to convey drilling fluid from containment areas to storage and recycling facilities for disposal.

#### 2.05 PERSONNEL REQUIREMENTS

- A. All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety. Each person must have at least two years directional drilling experience.
- B. A competent and experienced supervisor representing the CONTRACTOR and Drilling subcontractor shall be present at all times during the actual Directional Bore operation. The CONTRACTOR and Subcontractor shall have a sufficient number of competent workers on the job at all times to insure the Directional Bore is made in a timely and satisfactory manner.
- C. Personnel who are unqualified, incompetent or otherwise not suitable for the performance of this project shall be removed from the job site and replaced with a suitable person.

### PART 3 - EXECUTION

#### 3.01 GENERAL REQUIREMENTS

- A. The ENGINEER must be notified 3 days in advance of starting work. The Directional Bore shall not begin until the ENGINEER is present at the job site and agrees that proper preparations for the operation have been made. The ENGINEER'S approval for beginning the installation shall in no way relieve the CONTRACTOR of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract. It shall be the responsibility of ENGINEER to provide inspection personnel at such time as appropriate without causing undue hardship by reason of

delay to the CONTRACTOR.

- B. All work under this specification affecting state, county or city right-of-way or other facilities shall be carried out to the full satisfaction of the respective authorized representative. The CONTRACTOR shall fully inform himself of all requirements of the respective agency as pertains to specific project and shall conduct all his work accordingly.
- C. All equipment used by the CONTRACTOR on Owner's property and right-of-ways may be inspected by the OWNER or the Owner's Representatives and shall not be used if considered unsatisfactory by OWNER or Owner's Representatives.
- D. The Contractor shall be fully responsible for all damages arising from his failure to comply with the regulations and the requirements of these Specifications.

### 3.02 DIRECTIONAL DRILLING OPERATION

- A. The CONTRACTOR shall provide all material equipment, and facilities required for directional drilling. Proper alignment and elevation of the bore hole shall be consistently maintained throughout the directional drilling operation. The method used to complete the directional drill shall conform to the requirements of all applicable permits. Copies of all permits will be supplied to the CONTRACTOR by the OWNER.
- B. The entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on drawings. The CONTRACTOR will provide staking along the drill path on ten (10) foot intervals. Each stake shall be labeled with the appropriate stationing along the drill path with elevation at each stake. NOTE: These stakes shall be used to record profile information described in Part D. The staking will assist with noting any surface variations or anomalies. Significant differences between surveyed field conditions and plan/profile drawings should be reviewed by field engineer prior to initiating pilot hole operations.
- C. CONTRACTOR shall place silt fence between all drilling operations and any drainage, well-fields, wetland, waterway or other area designated for such protection necessary by documents, state, federal and local regulations or as otherwise directed by the Engineer. Additional environmental protections necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains and other measures. CONTRACTOR shall adhere to all applicable environmental regulations. Such preventative measures shall be considered incidental to the unit price for the directional drill.
- D. Readings shall be recorded after advancement of each successive drill pipe (no more than 10') and the readings plotted on the bore profile provided in the Drawings. Access to all recorded readings and plan and profile information shall be made available to the ENGINEER, or his representative, at all times. At no time shall the deflection radius of the drill pipe exceed the deflection limits of the carrier pipe as specified herein.
- E. All drilling fluids and lose cuttings shall be contained in pits or holding tanks for recycling or disposal, no fluids shall be allowed to enter any unapproved areas or

natural waterways. Upon completion of the directional drill project, the drilling mud and cuttings shall be disposed of by the CONTRACTOR at an approved dump site.

- F. The pilot hole shall be drilled on bore path with no deviations greater than 5% of depth over a length of 100-feet, CONTRACTOR will notify ENGINEER and ENGINEER may require CONTRACTOR to pull-back and re-drill from the location along bore path before the deviation. In the event that a drilling fluid fracture, inadvertent returns or returns loss occurs during pilot hole drilling operations, CONTRACTOR will discuss additional options with the ENGINEER and work will then proceed accordingly.
- G. Upon completion of pilot hole phase of the operation, a complete set of “as-built” records shall be submitted to the ENGINEER for approval prior to back-reaming. These records shall include copies of the plan and profile drawing, as well as directional survey reports as recorded during the drilling operation.
- H. Upon approval of the pilot hole location, the hole opening or back-reaming phase of the installation shall begin. The bore hole diameter shall be increased to accommodate the pullback operation of the required size of pipe. The type of hole opener or back reamer to be utilized in this phase shall be determined by the types of subsurface soil conditions that have been encountered during the pilot hole drilling operation. The reamer type shall be at the CONTRACTOR’S discretion with the final hole opening being a maximum of 1.5 times larger than the outside diameter of the pipe to be installed in the bore hole. The hole opener or back reamer operation shall be conducted in multiple passes, increasing size each time, to prevent frac-outs and damage to improved surfaces. The contractor shall provide “relief holes” along the bore alignment as necessary to relieve pressures that may be induced to the surface.
- I. The open bore hole may be stabilized by means of bentonite drilling slurry pumped through the inside diameter of the drill rod and through openings in the reamer. The drilling slurry must be in a homogenous / flowable state serving as an agent to carry the loose cuttings to the surface through the annulus of the borehole. The volume of bentonite mud required for each pullback shall be calculated based on soil conditions, largest diameter of the pipe couplings, capacity of the bentonite mud pump, and the speed of pullback as recommended by the bentonite drilling fluid manufacture. The bentonite slurry is to be contained at the exit or entry side of the directional bore in pits or holding tanks. The slurry may be recycled at this time for reuse in the hole opening operation, or shall be hauled by the CONTRACTOR to an approved dumpsite for proper disposal. The operator shall monitor the amount of slurry being discharge during the reaming or pipe pulling process. The operator shall cease pulling if the discharge substantially lessens. Contact Owner or Engineer.
- J. The pipe shall be a continuous run of copper tubing as per the specifications. A pulling eye will be attached to the pulling head on the lead stick of pipe which in turn will be attached to a swivel on the end of the drill pipe. Tracer wire solid coated copper wire shall be attached to the pulling eye and the side of pipe with a minimum of two full wraps of duct tape around the pipe. This will allow for a straight, smooth pull of the product pipe as it enters and passes through the borehole toward the drill rig and original entrance hole of the directional bore. The pipe will be elevated to the approximate angle of entry and supported by means of a sideboom with roller arm, or similar equipment, to allow for the “free stress” situation as the pipe is pulled into the exit hole toward the drill rig. The product pullback phase of the directional operation

shall be carried out in a continuous manner until the pipe reaches the original entry side of the bore. The operator shall monitor the tension applied to the pipe during the pipe pulling process. Any abrupt change in tension shall signal the operator to cease pulling. Contact Owner or Engineer.

- K. If pipe is pushed, the pipe shall be joined together according to manufacturer's specifications. Provide joint restraints as required to prevent over bellng pipe. Two (2) tracer wires shall be attached to the front pipe and the side of pipe with a minimum of two full wraps of duct tape around the pipe. This will allow for a straight, smooth push of the product pipe as it enters and passes through the borehole. The product pushing phase of the directional operation shall be carried out in a continuous manner until the pipe is fully installed through the hole.

### 3.03 PIPE HANDLING

- A. Care shall be taken during transportation of the pipe such that it will not be cut, kinked or otherwise damaged.
- B. Ropes, fabrics or rubber protected slings and straps shall be used when handling pipes. Chains, cables or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped into rocky or unprepared ground.
- C. Pipes shall be stored on level ground, preferable turf or sand, free of sharp objects which could damage the pipe. Stacking of the pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

### 3.04 SITE RESTORATION

- A. Following drilling operations, CONTRACTOR will de-mobilize equipment and restore the work site to the original conditions or better. All excavations will be backfilled and compacted according to the specifications.
- B. Surface restoration shall be completed in accordance with the requirements of the contract, to a condition as good as or better than existed prior construction.

### 3.05 RECORD KEEPING AND AS-BUILTS

- A. CONTRACTOR shall maintain a daily project log of drilling operations and a guidance system log with a copy given to the ENGINEER at completion of project.
- B. The MGS data shall be recorded per Item 3.02 paragraph D of this section during the actual crossing operation. The CONTRACTOR shall furnish "as-built" plan and profile drawing based on these recordings showing the actual location horizontally and vertically of the installation, and all utility facilities found during the installation. The MGS data shall be certified accurate by the CONTRACTOR to the capability of the MGS System.

END OF SECTION

## SECTION 02825

### SEWER LINE CLEANING

#### PART 1 - GENERAL

##### 1.01 INTENT

The intent of sewer line cleaning is to remove foreign materials from the lines as required for television inspection. Proper cleaning should restore the sewer to a minimum of 95% of its original cross-sectional area. It is recognized that there are some conditions such as collapsed pipe that prevent cleaning from being accomplished or where additional damage would result if cleaning were attempted or continued.

#### PART 2 - CLEANING EQUIPMENT

##### 2.01 HYDRAULICALLY PROPELLED EQUIPMENT

The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure removal of grease. If sewer cleaning balls or other equipment that cannot be collapsed are used, special precautions to prevent flooding of the sewers and public or private property shall be taken.

##### 2.02 HIGH-VELOCITY JET (HYDROCLEANING) EQUIPMENT

All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.

##### 2.03 MECHANICALLY POWERED EQUIPMENT

Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed. A power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750 feet of rod. The rod shall be specifically heat-treated steel. To ensure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.

## PART 3 - EXECUTION

### 3.01 SEWER CLEANING

The designated sewer manhole sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. The Owner shall provide the Contractor with access to hydrants for the necessary filling of tanks for sewer cleaning operations. Selection of the equipment used shall be based on the conditions of lines at the time the work commences. The equipment and methods selected shall be satisfactory to the Engineer. The equipment shall be capable of removing dirt, grease, rocks, sand, roots, protruded laterals, and other material and obstructions from the sewer lines and manholes. If cleaning of an entire section cannot be successfully performed from one manhole due to collapsed pipe, the equipment shall be set up on the other manhole and cleaning shall be attempted again. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, the Contractor will notify the Engineer for further direction.

#### A. Light Cleaning

“Light Cleaning” shall include the cleaning of a section of sewer using high-velocity water jetting equipment. The scope of work incidental to “Light cleaning” shall include to three (3) passes using the above mentioned equipment to remove sludge, dirt, grease, rocks, sand, gravel and similar debris from the designated sewer section.

#### B. Heavy Cleaning

“Heavy Cleaning” shall include that cleaning necessary to remove medium to large roots, root balls, protruding laterals and other material and obstructions from the sewer lines and manholes which cannot be removed through “Light Cleaning” alone, as described in “A” of this section. Light cleaning of each sewer section shall be incidental to the unit price bid for “Heavy Cleaning & T.V. Inspection”.

#### C. Sewer Cleaning Precautions

During sewer cleaning operations, satisfactory precautions shall be taken in the use of the cleaning equipment. When hydraulically propelled cleaning tools, or tools which retard the flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. When possible, the flow of sewage in the sewer shall be utilized to provide the necessary pressure for hydraulic cleaning devices. When additional water from fire hydrants is necessary to avoid delay in normal work procedures, the water shall be obstructed in case of a fire in the area served by the hydrant.

### 3.02 PROTRUDING LATERAL REMOVAL

Protruding laterals shall be removed in all mainline sections where a protrusion of greater than  $\frac{3}{4}$ " extends into the mainline. All protruding laterals shall be removed to a tolerance of  $\frac{3}{4}$ " from the inside wall of the mainline using engineer-approved methods.

### 3.03 ROOT REMOVAL

Roots shall be removed in the sections where root intrusion is a present. Special attention should be used during the cleaning operation to assure almost complete removal of roots from the joints. Any roots that could prevent the proper application of chemical sealants or cured in place pipe liner systems shall be removed. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines, and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners. Chain beaters shall be used at the Contractor's risk. Any sewer failures resulting from use of chain beaters, which will require a sewer point repair, shall be paid at the Contractor's expense.

### 3.04 MATERIAL REMOVAL

Sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section, which could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.

### 3.05 DISPOSAL OF MATERIALS

The Owner shall provide a dumpsite for all debris removed from the sewers during the cleaning operation. Unless stated otherwise, it is assumed this site will be in the immediate area. Any hazardous waste material encountered during this project will be considered as a changed condition.

### 3.06 FINAL ACCEPTANCE

Final acceptance of sewer line cleaning shall be made upon the successful completion of the television inspection and shall be to the satisfaction of the Engineer. If TV inspection shows the cleaning to be unsatisfactory, then the Contractor will reclean and reinspect the sewer line until the cleaning is shown to be satisfactory.

END OF SECTION

## SECTION 02826

### TELEVISION INSPECTION

#### PART 1 - GENERAL

##### 1.01 SCOPE

The work to be performed under this section of the Specifications consists of completing television inspection of all main sewers requiring rehabilitation as shown on the drawings and specified herein. Any television inspection work performed in addition to that shown on the drawings, shall require written approval from the Owner or Engineer, for this work to be considered for payment. The work includes, but is not limited to, the following:

##### 1.02 INSPECTION

- A. Inspect sewers using an integrated CCTV sewer inspection system consisting of cameras, lighting, transport cables, power source, monitor, digital video recorder and other equipment as necessary to properly perform the work.
- B. The television camera used for the inspection shall be one specifically designed and constructed for such inspection and shall be capable of panning 360° and tilting 270°. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera should be capable of generating a minimum of 500 lines of resolution. In general the camera, television monitor, and other components of the video system shall be capable of producing a color picture/video quality to the Owner's satisfaction.
- C. All CCTV coding shall be done in accordance with NASSCO's Pipeline Assessment Certification Program (PACP). The information called out should include, but is not limited to the following:
  - 1. Structural condition and deformation of the pipe walls
  - 2. Segment length (from inside walls of adjacent manholes)
  - 3. Manhole depth (invert to top of casting to nearest 0.1')
  - 4. Blockages or obstructions
  - 5. Condition of joints and pipe walls
  - 6. Standing water/sag conditions
  - 7. Infiltration/exfiltration
  - 8. Fluctuations in water level
  - 9. Size, location and condition of sewer laterals w/clock position
- D. The camera shall move through the sewer at a constant rate, stopping

when necessary to permit proper documentation of the sewer's condition for coding. In no case shall the television camera be pulled at a speed greater than 30 feet per minute. In addition, capture a still picture (color jpeg format) of all significant defects observed during an inspection and record segment, location along sewer, clock position, time and defect code for each picture. The operator shall also capture a still photograph looking up each lateral, noting location along sewer, clock position and defects as necessary.

- E. During the inspection, clearly and continuously display the following information on the periphery of the screen, monitor and video recording:
  - 1. Starting Location ID
  - 2. Ending Location ID
  - 3. Distance from Starting Manhole Location
- F. If inspection of an entire sewer segment cannot be completed due to a collapse, excessive deformation, debris, intruding connections, obstructions or large displaced joints, move equipment to the downstream manhole and attempt inspection in the upstream direction. Advise the Owner's Representative if any complete sewer segment cannot be inspected on a daily basis. Track all locations where a complete inspection could not be obtained and clearly document the length of sewer not inspected, location, segment, distance from adjacent manholes, etc.
- G. Removal of roots, debris and flow control required to obtain a suitable video record of the subject sewer mains shall be incidental to the contract.
- H. Provide flow control and/or by-pass pumping for all sewers where the depth of flow is 25% of the pipe diameter or greater. See Specification 02827.
- I. Light cleaning consisting of up to 3 passes with a jet truck for removal of small roots and debris shall be incidental to the contract. All debris shall be removed from the sewer system and not passed downstream.

### 1.03 CERTIFICATIONS

All CCTV operators shall maintain current NASSCO's PACP's certification and shall provide suitable document of such upon request by the Owner.

### 1.04 MEASUREMENT

- A. Measure and record the depth of all manholes adjacent to the subject sewer segment from the manhole invert to the top of casting to the nearest 0.1 foot using a roll tape. Marked camera cable will not be allowed.

- B. Reference all distance measurements along the sewer to the inside walls of adjacent manholes to the nearest 0.1 foot. All references to defects and/or lateral locations along the sewer main shall be within  $\pm 2$  feet.
- C. Payment for video inspection as provided for in these specifications shall be made based on the horizontal distance between the center of manholes at ground level as measured by a roll-tape or other suitable means to the nearest foot.

#### 1.05 REPORTS AND SUBMITTALS

- A. Submit two copies of the following items within two weeks, following completion of all required video inspection activities:
  - 1. Electronic inspection videos recorded and organized on CD/DVD.
  - 2. Electronic still-capture pictures of significant defects on CD/DVD
  - 3. Printed inspection logs w/location and defect codes
  - 4. Printed list of standard PACP defect codes
- B. All inspection videos shall be configured for viewing using Windows Media Player Version 10 (or a more recent version) and have the ability to use all features of the video player including fast forward capability.
- C. Clearly label each CD/DVD with the following information in an organized format:
  - 1. Name of Inspection Contractor w/address
  - 2. Project Name
  - 3. Disc \_\_\_ of \_\_\_
  - 4. Section \_\_\_\_\_ to Section \_\_\_\_\_
  - 5. Date of Inspection
- D. No payment will be made for poor or unacceptable quality videos or for portions of sewer mains not televised, for any reason. If, in the opinion of the Owner, the video is of such poor quality that the condition of the sewer cannot be adequately assessed, the Contractor shall re-inspect the unacceptable segments and resubmit all deliverables for that segment at no additional cost to the Owner.

END OF SECTION

## SECTION 02827

### SEWER FLOW CONTROL

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. When sewer depth of flow at the upstream manhole of the subject sewer main is above the maximum allowable for television inspection or sewer rehabilitation work, the flow shall be reduced to zero, or to the level shown below by operation of pump stations, plugging or blocking of the flow, or by pumping and bypassing of the flow as specified.
- B. Depth of flow shall not exceed that shown below for the respective pipe sizes as measured in the manhole when performing television inspection.
  - 1. Maximum depth of flow for television inspection.
    - a. 6 inch to 10 inch pipe - 20% of pipe diameter.
    - b. 12 inch to 24 inch pipe - 25% of pipe diameter.
    - c. 27 inch and up pipe - 30% of pipe diameter.

#### PART 2 - EXECUTION

##### 2.01 PLUGGING OR BLOCKING

A sewer line plug shall be inserted into the line upstream of the section being worked. The plug shall be so designed that all or any portion of the sewage can be released. During TV inspection, flow shall be reduced to within the limits specified above. After the work has been completed, flow shall be restored to normal.

##### 2.02 PUMPING AND BYPASSING

When pumping and bypassing is required, the Contractor shall supply the pumps, conduits, and other equipment to divert the flow of sewage around the manhole section in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flow plus additional flow that may occur during a rainstorm. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum.

##### 2.03 FLOW CONTROL PRECAUTIONS

When flow in a sewer line is plugged, blocked, or bypassed; sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging. Further, precautions must be taken to ensure that the sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.

END OF SECTION

## SECTION 02828

### CURED-IN-PLACE LATERAL RECONSTRUCTION FROM MAINLINE

#### PART 1 - INTENT

- 1.1 It is the intent of this portion of this specification to provide for the reconstruction of service lateral sanitary sewer lines without excavation by the installation of a resin impregnated flexible felt tube inverted into the existing service lateral utilizing a pressure apparatus positioned in the mainline pipe, or by accessing the lateral via cleanout with main/lateral interface seal. Curing shall be accomplished by circulating hot water or other approved method to cure the resin into a hard impermeable pipe. When cured, the tubing should extend over the length of the inversion in a continuous tight-fitting pipe-within-a-pipe to form a watertight, airtight interface with the mainline reconstructed pipe.

#### PART 2 - REFERENCE SPECIFICATIONS

- 2.1 Unless otherwise noted, reference is made to the latest version of the documents listed below:
  - A. ASTM F1216, Rehabilitation of Pipelines by the Inversion and Curing of a Resin-Impregnated Tube
  - B. ASTM F1743, Rehabilitation of Pipelines by Pulled-In-Place Installation of a Cured-In-Place Thermosetting Resin Pipe
  - C. ASTM D790, Test Methods for Flexural Properties of Non-Reinforced Plastics
  - D. ASTM D5813, Standard Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems
  - E. ASTM D638, Standard Test Method for Tensile Properties of Plastics

In case of conflicting requirements between this Specification and these referenced documents, this Specification will govern.

#### PART 3 - GENERAL CORROSION REQUIREMENTS

- 3.1 The finished cured-in-place pipe (CIPP) shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage and meet the chemical corrosion resistance requirements of ASTM F1216 and D5813.

- 3.2 All constituent materials will be suitable for service in the environment intended. The final product will not deteriorate, corrode or lose structural strength that will reduce the projected product life.
- 3.3 In industrial areas subject to possible flows other than domestic sewage, the Owner shall obtain samples of the dry weather sewage flow to be analyzed for chemical content. This analysis shall be supplied to the Installer for his information.

#### PART 4 - MATERIALS

- 4.1 The tube shall be fabricated to a size that when installed will neatly fit the internal circumference of the conduit. Allowance shall be made for circumferential stretching during insertion.
- 4.2 The minimum length shall be that deemed necessary by the Engineer to effectively span the distance from the lateral connection at the main to the desired termination location in the service lateral pipe. The Installer shall verify the lengths in the field before impregnation.
- 4.3 Unless otherwise specified, the Installer shall furnish a specially designed resin system compatible with the cured-in-place process that provides cured physical strengths and corrosion resistance specified herein.

#### PART 5 - PHYSICAL STRENGTH

- 5.1 The structural performance of the finished pipe must be adequate to accommodate all anticipated loads throughout its design life. No cured-in-place pipe reconstruction technology will be allowed that requires bonding to the existing pipe for any part of its structural strength. Only resin vacuum impregnation will be allowed. If reinforcing materials (fiberglass, etc.) are used, the reinforcing material must be fully encapsulated within the resin to assure that the reinforcement is not exposed, either to the inside of the pipe or at the interface of the CIPP and the existing pipe.
- 5.2 Design methods are to be derived from traditionally accepted pipe formulae for various loading parameters and modes of failure. All equations will be modified to include ovality as a design parameter. The design method shall be submitted to the Engineer for approval prior to the pre-bid conference.
- 5.3 The cured tubing shall conform to the minimum structural standards as listed below:

<b>Property</b>	<b>ASTM Standard</b>	<b>Results</b>
Flexural Stress	ASTM D790	4,500 psi
Flexural Modulus or Elasticity	ASTM D790	250,000 psi
Tensile Strength	ASTM	3,000 psi

#### PART 6 - DEVATIONS

- 6.1 The Installer shall submit his price proposal for the appropriate length, size and thickness designated in the proposal section. Should pre-installation inspections reveal the service laterals to be in substantially different conditions than those in the design considerations, the Installer shall request such changes in thickness, supporting such request with design data. The deviation, if approved, shall be reflected by the appropriate addition or reduction in the unit cost for that size as shown in the optional portion of the proposal section.

## PART 7 - INSTALLATION PREPARATIONS

- 7.1 The following installation procedures shall be adhered to unless otherwise approved by the Owner's representative.
- 7.2 Safety – The installer shall carry out his operations in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements involving entering confined spaces.
- 7.3 Cleaning of Sewer Line – It shall be the responsibility of the Installer to remove all internal debris out of the sewer line. See Section 02825 of these Specifications.
- 7.4 Inspection of Pipelines – Inspection of pipelines shall be performed by experienced personnel trained in locating breaks and obstacles by closed circuit television. The interior of the pipeline shall be carefully inspected to determine the location of any conditions which may prevent proper installation of CIPP into the pipelines, and it shall be noted so that these conditions can be corrected. A videotape and suitable log shall be kept for later reference by the Owner.
- 7.5 See Section 02827 – Sewer Flow Control of these Specifications.
- 7.6 Line Obstructions – It shall be the responsibility of the Installer to clear the line of obstructions such as solids, dropped joints, roots or collapsed pipe that will prevent the insertion of CIPP. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, the Installer shall make a point repair excavation to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the Owner's representative prior to the commencement of the work and shall be considered as a separate pay item. Upon completion of a prior approved point repair, the repaired line shall be inspected, as outlined in Section 02826, prior to lining the sewer. This inspection work shall be considered as incidental to the unit price bid for point repair work.
- 7.7 The service lateral pipe opening at the confluence with the mainline sewer should be prepared in a manner that is consistent with ASTM F1743.

## PART 8 - INSTALLATION

- 8.1 The Installer shall designate a location where the tube will be vacuum impregnated prior to installation. The Installer shall allow the Owner to inspect the materials and “wet-out” procedure. A catalyst system compatible with the resin and tubing shall be used.
- 8.2 The wet-out tube shall be loaded inside a pressure apparatus above ground. The pressure apparatus, with an end attached to a robotic device, shall be winched through the mainline pipe to the service connection. The robotic device, together with a television camera, will be used to position the pressure apparatus’ inversion elbow at the service connection opening. Air pressure, supplied to the pressure apparatus through an inversion hose, shall be used to invert the wet-out tubing through the lateral pipe. The inversion head will be adjusted to be of sufficient pressure to cause the impregnated tubing to invert completely in the lateral pipe and hold the tube tight to the pipe wall. Care shall be taken during the curing process so as not to overstress the tube.
- 8.3 Curing – Curing shall be performed as per the manufacturer’s recommendations.
- 8.4 Finish – The finished CIPP shall be continuous over the entire length of an inversion run and be free of dry spots, lifts, and delamination. The lateral CIPP shall not inhibit the closed circuit television post video inspection of the mainline or service lateral pipes.
- 8.5 During the one-year warranty period, any defects which will affect the integrity or strength of the CIPP shall be repaired at the Installer’s expense in a manner mutually agreed upon by the Engineer and the Installer.
- 8.6 After the work is completed, the Installer will provide the Owner and Engineer with a videotape showing the completed work including the restored site.

## PART 9 - CLEAN-UP

- 9.1 Upon acceptance of the installation work, the Installer shall reinstate the project area affected by his operations to its original condition.

## PART 10 - PAYMENT

- 10.1 Payment for the work included in this section will be in accordance with the prices set forth in the proposal for the quantity of work performed. Progress payments will be made monthly based on the work performed during that period.

## SECTION 02831

### CURED-IN-PLACE PIPE (CIPP)

#### PART 1 - SCOPE

- 1.1 The Contractor shall furnish all material equipment, tools, and labor necessary to rehabilitate existing sanitary sewers by installing cured-in-place pipe and re-establishing existing sewer house connections as indicated on the drawings and in accordance with the Contract documents.
- 1.2 CCTV videos have been obtained for the segments to be rehabilitated. Copies of the videos are available upon request.

#### PART 2 - QUALITY ASSURANCE

- 2.1 Personnel directly involved with installing cured-in-place pipe shall have received training in the proper methods for handling, inserting, and finishing the pipe. The Contractor shall provide a certification of training for each crew member.

#### PART 3 - REFERENCED STANDARDS

- 3.1 Unless otherwise noted, reference is made to the latest version of the documents listed below:
  - A. ASTM F1216, Rehabilitation of Pipelines by the Inversion and Curing of a Resin-Impregnated Tube
  - B. ASTM F1743, Rehabilitation of Pipelines by Pulled-In-Place Installation of a Cured-In-Place Thermosetting Resin Pipe
  - C. ASTM D790, Test Methods for Flexural Properties of Non-Reinforced Plastics
  - D. ASTM D5813, Standard Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems
  - E. ASTM D638, Standard Test Method for Tensile Properties of Plastics

In case of conflicting requirements between this Specification and these referenced documents, this Specification will govern.

#### PART 4 - PRODUCT, MANUFACTURER/INSTALLER QUALIFICATION REQUIREMENTS

- 4.1 All trenchless rehabilitation products and installers must be pre-approved prior to the formal opening of proposals. Products and Installers seeking approval must meet all of the following criteria to be deemed Commercially Acceptable:

- 4.1.1 For an Installer to be considered as Commercially Proven, the Installer must satisfy all insurance, financial, and bonding requirements of the Owner. In addition, the Installer shall be a recognized contractor whose personnel have been regularly engaged in the preparation and use of cured-in-place pipe materials for sewer pipe rehabilitation. The Installer must be able to demonstrate experience with the installation of projects similar in length and diameter of those listed in this project. Acceptable documentation of these installations must be submitted to the Owner.
- 4.1.2 Sewer rehabilitation products submitted for approval must provide third party test results supporting the structural performance (short-term and long-term) of the product and such data shall be satisfactory to the Owner. Test samples shall be prepared so as to simulate installation methods and trauma of the product.
- 4.1.3 Both the rehabilitation manufacturing and installation processes shall operate under a quality management system which is third-party certified to recognized organization standards. Proof of certification may be required for approval.
- 4.1.4 Proposals must be labeled clearly on the outside of the proposal envelope, listing the product name and installer being proposed. Only proposals using pre-approved products and installers will be opened and read. Proposals submitted on products and/or from installers that have not been pre-approved will be returned unopened.

## PART 5 - MATERIALS

- 5.1 Tube - The sewn Tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216 or ASTM F1743, Section 5. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.
  - 5.1.1 The wet-out Tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the design thickness.
  - 5.1.2 The Tube shall be manufactured to a size that when installed will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during inversion. Overlapped layers of felt in longitudinal seams that cause lumps in the final product shall not be utilized.
  - 5.1.3 If the tube is to be installed through a pipe size change, the annular space created in transitions shall be filled with suitable grout materials.
  - 5.1.4 The outside layer of the Tube (before wet-out) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate

monitoring of resin saturation during the resin impregnation (wet-out) procedure.

- 5.1.5 The Tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the Tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.
- 5.1.6 The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
- 5.1.7 Seams in the Tube shall be stronger than the non-seamed felt.
- 5.1.8 The outside of the Tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol. The tubes must be manufactured in the USA.
- 5.2 Resin - The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216 and ASTM F1743, the physical properties herein, and those which are to be utilized in the design of the CIPP for this project. The resin shall produce CIPP that will comply with the structural and chemical resistance requirements of this specification.

## PART 6 - STRUCTURAL REQUIREMENTS

- 6.1 The CIPP shall be a structural liner design as per ASTM F1216, Appendix X.1. The CIPP design shall assume no bonding to the original pipe wall.
- 6.2 The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by his/her Company. Such testing results are to be used to determine the Long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (Tube and Resin) and general workmanship of the installation and curing. A percentage of the instantaneous flexural modulus value (as measured by ASTM D790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Values in excess of 50% will not be applied unless substantiated by qualified third party test data. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in design.
- 6.3 The Enhancement Factor 'K' to be used in 'Partially Deteriorated' Design conditions shall be assigned a value of 7. Application of Enhancement 'K' Factors in excess of 7 shall be substantiated through independent test data.

- 6.4 The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occur during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.
- 6.5 The cured pipe material (CIPP) shall conform to the structural properties, as listed below.

**MINIMUM PHYSICAL PROPERTIES**

<u>Property</u>	<u>Test Method</u>	<u>Cured Composite min. per ASTM F1216</u>	<u>Cured Composite (300,000 psi Resin)</u>
Modulus of Elasticity	ASTM D790 (short term)	250,000 psi	300,000 psi
Flexural Stress	ASTM D790	4,500 psi	4,500 psi
Tensile Strength	ASTM D638	3,000 psi	3,000 psi

- 6.6 **The required structural CIPP wall thickness shall be 7 mm**, based as a minimum, on the physical properties in Section 6.5 and in accordance with the Design Equations in the appendix of ASTM F 1216, and the following design parameters:

Design Safety Factor	=	<u>2.0</u>
Retention Factor for Long-Term Flexural Modulus to be used in Design <i>(as determined by Long-Term tests described in paragraph 5.2)</i>	=	<u>1% - 60%</u>
Ovality*	=	<u>2%</u>
Enhancement Factor, k	=	<u>See Section 6.3</u>
Groundwater Depth (above invert)*	=	<u>8 ft.</u>
Soil Depth (above crown)*	=	<u>10 ft.</u>
Soil Modulus**	=	<u>1000 psi (assumed)</u>
Soil Density**	=	<u>120 pcf</u>
Live Load**	=	<u>H20 Highway</u>
Design Condition (partially or fully deteriorated)***	=	<u>Partially</u>

- \* Denotes information which can be provided here or in inspection video tapes or project construction plans. Multiple line segments may require a table of values.
- \*\* Denotes information required only for fully deteriorated design conditions.
- \*\*\* Based on review of video logs, conditions of pipeline can be fully or partially deteriorated. (See ASTM F1216 Appendix) The Owner will be sole judge as to pipe conditions and parameters utilized in Design.

- 6.7 Refer to the attached Dimensional Ratio table for specific pipe section requirements, based on the pipe condition, depth, ovality, etc. as computed for the conditions shown, using ASTM F1216 Design Equations.

- 6.8 Any layers of the tube that are not saturated with resin prior to insertion into the existing pipe shall not be included in the structural CIPP wall thickness computation.
- 6.9 Design methods are to be derived from traditionally accepted pipe formulae for various loading parameters and modes of failure. All equations will be modified to include ovality as a design parameter. The design method shall be submitted to the Engineer for approval prior to the pre-construction conference.

#### PART 7 - TESTING REQUIREMENTS

- 7.1 Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements.
- 7.2 Hydraulic Capacity - Overall, the hydraulic profile shall be maintained as large as possible. The CIPP shall have a minimum of the full flow capacity of the original pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.
- 7.3 CIPP Field Samples - When requested by the Owner, the Contractor shall prepare and submit to the Owner restrained field samples taken at jobsite for 3<sup>rd</sup> party testing. These test results must verify that the CIPP physical properties specified in Section 6.5 have been achieved. Samples for this project shall be made and tested as described in PART 12. Each sample shall be properly labeled for location, job, date, thickness and shot number.

#### PART 8 - INSTALLATION RESPONSIBILITIES FOR INCIDENTAL ITEMS

- 8.1 The Owner shall provide access to water hydrants for cleaning, inversion and other work items requiring water.
- 8.2 Cleaning of Sewer Lines - The Contractor, when required, shall remove all internal debris out of the sewer line that will interfere with the installation of CIPP. The Owner shall provide a dumpsite for all debris removed from the sewers during the cleaning operation. Unless stated otherwise, it is assumed this site will be at or near the sewage treatment facility to which the debris would have arrived in absence of the cleaning operation. Any hazardous waste material encountered during this project will be considered as a changed condition.
- 8.3 Bypassing Sewage - The Contractor, when required, shall provide for the flow of sewage around the section or sections of pipe designated for repair. Refer to Section 02827 of these Specifications.
- 8.4 Inspection of Pipelines - Inspection of pipelines shall be performed by experienced

personnel trained in locating breaks, obstacles and service connections by close circuit television. The interior of the pipeline shall be carefully inspected to determine the location of any conditions that may prevent proper installation of CIPP into the pipelines, and it shall be noted so that these conditions can be corrected. A CD/DVD and suitable log shall be kept for later reference by the Owner.

- 8.5 Line Obstructions - It shall be the responsibility of the Contractor to clear the line of obstructions such as solids and roots that will prevent the insertion of CIPP. If pre-installation inspection reveals an obstruction such as a protruding service connection, dropped joint, or a collapse that will prevent the inversion process, that was not evident on the pre-bid video and it cannot be removed by conventional sewer cleaning equipment, then the Contractor shall make a point repair excavation to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the Owner's representative prior to the commencement of the work and shall be considered as a separate pay item. Upon completion of a prior approved point repair, the repaired line shall be inspected as outlined in Section 02826, prior to lining the sewer. This inspection work shall be considered as incidental to the unit price bid for point repair work.
- 8.6 Public Notification - The Contractor shall make every effort to maintain service usage throughout the duration of the project. In the event that a customer will be out of service, the maximum amount of time of interruption shall be 8 hours for any property served by the sewer. A public notification program shall be implemented and shall, as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The Contractor shall also provide the following:
- A. Written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the Contractor the customers can call to discuss the project or any problems which may arise.
  - B. Personal contact with any home or business, which cannot be reconnected within the time stated in the written notice.
- 8.7 The Contractor shall be responsible for confirming the locations of all branch service connections prior to installing and curing the CIPP. The Contractor shall also coordinate with the Owner to verify abandoned services prior to reinstating services.
- 8.8 Maintenance of Traffic – The Contractor shall be responsible for ensuring that adequate traffic control devices are installed and maintained where work is within or adjacent to highways, streets, alleys, etc. All city street closures shall be coordinated with the city no less than 48 hours in advance of construction. Maintain 1 lane of traffic to the greatest extent possible. The Contractor shall prepare and submit a Maintenance of Traffic Plan to the Owners for review 2 weeks prior to any work within Kentucky Department of Highways right-of-way. This plan shall be prepared in accordance with the Kentucky Department of Highways Standard

Drawings and/or the Manual on Uniform Traffic Control Devices (MUTCD), current edition.

## PART 9 – INSTALLATION

9.1 CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with the following modifications:

9.1.1 Resin Impregnation - The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process shall be used. To insure thorough resin saturation throughout the length of the felt tube, the point of vacuum shall be no further than 25 feet from the point of initial resin introduction.

After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the Installer uses an alternate method of resin impregnation, the method must produce the same results. Any alternate resin impregnation method must be proven.

9.1.2 Tube Insertion - The wet-out tube shall be positioned in the pipeline using either inversion or a pull-in method. If pulled into place, a power winch should be utilized and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point. If inverted into place, the speed shall be controlled to prevent or minimize wrinkling.

9.1.3 Temperature gauges shall be placed inside the tube at the invert level of each end to monitor the temperatures during the cure cycle. If lining through multiple manhole sections, intermediate gauges shall also be utilized.

9.1.4 Curing shall be accomplished by utilizing hot water or steam under hydrostatic pressure in accordance with the manufacturer's recommended cure schedule.

## PART 10 - REINSTATEMENT OF BRANCH CONNECTIONS

10.1 It is the intent of these specifications that branch connections to buildings be reopened without excavation, utilizing a remote controlled cutting device, monitored by a video TV camera\*. The Contractor shall certify he has a minimum of 2 complete working cutters plus spare key components on the site before each inversion. Unless otherwise directed by the Owner or his authorized representative, prior to inversion,

all laterals will be reinstated. No additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.

\* All branch connections are to be cut to the internal diameter of the branch line, within a tolerance of 0.5 inches. All brushed to ensure a smooth transition from branch to main line. Overcut services shall be patched by the Contractor at no cost to the Owner. All undercut services shall be enlarged to meet 0.5 inch requirement.

## PART 11 - DEVIATIONS

- 11.1 The Installer shall submit his price proposal for the appropriate length, size and thickness designated in the proposal section. The deterioration of service laterals is an ongoing process. Should pre-installation inspections reveal the service laterals to be in substantially different conditions than those in the design considerations, the Installer shall request such changes in liner thickness, supporting such request with design data. The deviation, if approved, shall be reflected by the appropriate addition or reduction in the unit cost for that size as shown in the optional portion of the proposal section.

## PART 12 - INSPECTION

- 12.1 CIPP samples shall be prepared and physical properties tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The flexural properties must meet or exceed the values listed in Table 1 of the applicable ASTM.
- 12.2 Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743. The minimum wall thickness at any point shall not be less than 87.5% of the design thickness as calculated in paragraph 6.6 of this document.
- 12.3 Visual inspection of the CIPP shall be in accordance with ASTM F1743, Section 8.6.
- 12.4 Two (2) copies of the Contractor's curing logs shall be prepared and delivered to the Owner.

## PART 13 - CLEAN-UP

- 13.1 Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by the operations to a condition at least equal to that existing prior to the work.

## PART 14 - PAYMENT

- 14.1 Payment for the work included in this section will be in accordance with the prices set forth in the proposal for the quantity of work performed. Progress payments will be made monthly based on the work performed during that period.
- 14.2 Full payment shall not be made until after all post installation videos have been

reviewed and approved by the Owner (or Engineer).

**PART 15 - WARRANTY**

- 15.1 All work associated with this section shall be covered by a two-year contract warranty against defective materials or workmanship.
- 15.2 The Owner shall retain the right to request extended warranties with respect to specifically noted items during punch list inspections.
- 15.3 A warranty inspection shall be performed approximately 12 months following, but not to exceed 24 months following completion of the project. 20 percent of the installed product shall be inspected. If significant defects are noted, the Contractor shall be responsible for costs incurred to inspect the remaining segments.

**CIPP WALL THICKNESS**

**PARTIALLY DETERIORATED DESIGN ( PD )**

		Required DR ( D / t )			
		Ei = 250,000 psi		Ei = 400,000 psi	
		Ground Water Depth			
Ovality	Range of Depth to invert (feet)	50% Depth	Full Depth	50% Depth	Full Depth
2 % *	4 - 8	78	62	92	73
	8 - 12	69	55	80	64
	12 - 16	62	50	73	58
	16 - 20	58	46	68	54
	20 - 24	55	44	64	51
5 %	4 - 8	72	57	84	67
	8 - 12	63	50	73	58
	12 - 16	57	46	67	53
	16 - 20	53	42	62	49
	20 - 24	50	40	58	47
8 %	4 - 8	66	52	77	61
	8 - 12	58	46	67	54
	12 - 16	52	42	61	49
	16 - 20	49	39	57	45
	20 - 24	46	37	54	43

PD wall thickness varies with the height of the groundwater above the invert of the host pipe. The table assumes the height of the groundwater equal to half or full depth to the pipe invert. The

table represents CIPP pipe wall thickness for a host pipe range of 8 to 48 inches. This is a guideline only. Specific calculations should refer to ASTM F-1216, Appendix X.1.

Design Parameters:

Poisson's Ratio = 0.3

Factor of Safety = 2.0

Enhancement Factor = 7

DR = Dimension Ratio = Diameter / thickness \_  $t = D / DR$

Effective reduction of Ei modulus to approximate effects of creep = 50 %

Ovality % = 100 x ( Mean Dia. - Minimum Dia. ) / Mean Dia.

\* 2% ovality is typically assumed when the host pipe measurements have not been field verified.

END OF SECTION

## SECTION 02835

### SEWER MANHOLE REHABILITATION

#### PART 1 - SCOPE

This section of the specifications provides for all aspects of manhole rehabilitation and sealing using various procedures either singularly or in combination.

#### PART 2 - GENERAL

2.01 Sewer manhole rehabilitation includes the following:

- A. Sealing, plugging, patching, and coating of the manhole structure, including chimney, corbel/cone, wall, and base with mortars, coatings and sealants to improve the surface condition, eliminate infiltration, and provide corrosion protection.
- B. Lining and structural enhancement of the manhole by applying a monolithic fiber reinforced cementitious liner.
- C. Repair or rebuilding of the manhole bench, or of the manhole chimney and corbel to improve structural condition when excavation is required.
- D. Removal and/or replacement of unsound and missing steps.
- E. Reinstallation or replacement of manhole frames and covers for grade adjustment, frame alignment, or inflow elimination.
- F. Elimination of infiltration/inflow under the manhole frame.
- G. Elimination of inflow through and around manhole covers.

#### PART 3 - QUALITY ASSURANCE

Sewer manhole rehabilitation work shall be performed by personnel trained in the proper mixing and application of the products specified herein. The contractor shall furnish the Engineer with training certificates for personnel responsible for application of the manhole rehabilitation products specified herein.

#### PART 4 - SUBMITTALS

Submit six (6) copies of the following:

Manufacturer's technical data for products proposed for use in conjunction with this section of work.

Manufacturer’s recommended installation or application procedures.

Training certificates for personnel.

### PART 5 - MATERIALS

5.01 The materials used for manhole sealing, plugging, and patching shall be designed, manufactured, and intended for sewer manhole rehabilitation and the specific application in which they are used. The materials shall have a proven history of performance in sewer manhole rehabilitation. The materials shall be delivered to the job site in original unopened packages and clearly labeled with the manufacturer’s identification and printed instructions. All material shall be stored and handled in accordance with recommendations of the manufacturer and the American Concrete Institute.

#### A. Cement Plugging

The grout used to plug active infiltration shall be a rapid set hand mixed and hand applied cementitious product with set modifiers and other additives. The plugging mix shall be formulated with calcium silicate, calcium aluminate cements, mineral filler, and specially selected chemical additives for set control. The plugging mix is to be applied according to manufacturer’s recommendations, and shall meet the following physical property requirements:

Compressive Strength [ASTM C-109]:	1 hr:	400-600 psi
	24 hr:	1800-2400 psi
	28 days:	5500-6000 psi

Expansion [ASTM C-827]:	1 day:	0.10%
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Pull Out Strength [ASTM C-234]:	14000 lb #4 rebar imbedded 5-1/2@ in 1@ diameter cement pocket
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Sulfate Resistance [ASTM C-267]:	No weight loss after 15 cycles, immersed in 2000 ppm sulfuric acid, test continuing
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Freeze/Thaw Resistance [ASTM C-666, Method A]:	98 cycles
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Set Time [ASTM C-191]:	60-90 sec
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The plugging mix shall be Strong-Plug as manufactured by Strong-Seal® Systems, Corp., or approved equal.

B. Cement Patching

The grout used for filling interior voids shall be a rapid set hand mixed and hand applied cementitious product with set modifiers. The patching mix shall be formulated with calcium aluminate cement, specially selected chemical additives, and fiber reinforcement. The patching mix is to be mixed and applied according to manufacturer's recommendations, and shall meet the following physical property requirements:

Compressive Strength [ASTM C-109]:	15 min:	200 psi
	1 hr:	>800 psi
	6 hr:	1400 psi
	24 hr:	>1800 psi

Shrinkage [ASTM C-596]: 0% at 90% relative humidity

Bond Strength [ASTM C-882]: 28 day: >1,600 psi

Mix Ratio (by volume): 1 part water to 3 parts patching mix

Mix Time: hand mix only-maximum, 1 min

Wet Density: 105 pcf, ± 5 pcf

Placement Time: 5-10 min

Flow Release: 15-30 min after placement

The patching mix shall be Strong-Seal® QSR as manufactured by Strong-Seal® Systems, Corp., or approved equal.

C. Monolithic Liner

The liner material used for manhole sealing shall be a rapid set spray applied cementitious product. The liner shall be formulated with calcium aluminate cement and consist of a blend of acid resistant binders, pozzolanic materials, silicious aggregates, fiberglass rods and other additives.

Each manhole to be lined shall be evaluated in the field to determine the type of liner to be applied. Any manhole noted by the Contractor and/or Inspector to require the use of high sulfate resistance materials shall be approved by the Engineer/Owner prior to application. The liner shall be impervious to the flow of water, resistant to sulfide attack, and shall restore structural integrity to existing substrates, and shall meet the following physical property requirements:

1. Base Condition:

Compressive Strength [ASTM C-109]:	28 day:	> 9,000 psi
Tensile Strength [ASTM C-496]:	28 day:	> 600 psi
Flexural Strength [ASTM C-293]:	28 day:	> 1,000 psi

Shrinkage [ASTM C-596]:	0% when cured @ 90% relative humidity
Freeze/Thaw [ASTM C-666 (Method A)]:	No visual damage after 100 cycles
Sulfate Resistance [ASTM C-267]:	For use in environments with pH levels 3.0 or higher
Water/Cement Ratio:	0.36 to 0.45
Bond Strength [ASTM C-882]:	28 day: >2,000 psi

The lining material shall be Strong-Seal® MS-2A as manufactured by Strong-Seal® Systems, Corp., or approved equal.

## 2. High Sulfate Resistance Condition:

Compressive Strength [ASTM C-109]:	28 day:	> 9,000 psi
Tensile Strength [ASTM C-496]:	90 day:	> 800 psi
Flexural Strength [ASTM C-78]:	90 day:	> 1,200 psi
Shrinkage [ASTM C-596]:	0% when cured @ 90% relative humidity	
Freeze/Thaw [ASTM C-666 (Method A)]:	No visual damage after 100 cycles	
Sulfate Resistance [ASTM C-267]:	For use in environments with pH levels 1.0 or higher	

The lining material shall be Strong-Seal® High Performance Mix or approved equal.

## PART 6 - EQUIPMENT

Equipment used to mix and apply the lining material shall meet the requirements and specifications of the manufacturer.

## PART 7 - MIXING

For each bag of product, the amount of water used shall be as specified by the manufacturer and mixing shall be done using the approved equipment. Material shall be placed into the mixing hopper with such timing so that the liner can be sprayed continuously without interruption until each application is complete.

## PART 8 - APPLICATION

All materials shall be mixed and applied in accordance with the manufacturer's written instructions.

- 8.01 Cleaning: All concrete and masonry surfaces must be clean. Grease, laitance, loose bricks, mortar, unsound concrete, and other materials must be completely removed. Water blasting utilizing proper nozzles shall be the primary method of cleaning; however, other methods such as wet or dry sandblasting, acid wash, concrete cleaners, degreasers or mechanical means may be required to properly clean the surface. Surfaces on which these other methods are used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products.
- 8.02 Preparation for Manhole Sealing: After cleaning, the manhole interior surface shall be prepared for sealing. Loose or missing brick shall be removed and replaced, actively leaking areas plugged, and voids patched. Any patching and/or

plugging materials shall be deemed compatible with the lining material used for sealing the manhole as determined by the manufacturers. Actively leaking areas shall be plugged with grout conforming to the requirements of paragraph 5.01.A of this section. Holes (including holes left after removing steps), voids, and cracks shall be patched with grout conforming to the requirements of paragraph 5.01.B of this section.

- 8.03 Manhole Sealing with Cement Manhole Liner: Prior to application (spraying) of the lining material, the entire manhole surface shall be clean and free of foreign material, and damp without noticeable free water droplets or running water, but totally saturated. The material shall be sprayed from the bottom of the wall to the top of the manhole to form a coating of uniform thickness sufficient to insure that all cracks, crevices, and voids are filled and a relatively smooth surface remains after light troweling. The light troweling shall compact the materials into voids and crevices and set the bond onto the manhole interior surface.

After the first application has taken an initial set (disappearance of surface sheen which could be 15 minutes to 1 hour depending upon ambient conditions), a second application shall be made again from the bottom up to assure a minimum thickness of 1-inch. The surface shall be troweled to a smooth finish, with care taken to not over-trowel so as to bring additional water to the surface and thereby weaken the finished liner.

The bench shall be sprayed in such a manner to produce a bench having a gradual slope from the wall/bench intersection to the invert. Material at the wall/bench intersection shall be built up and rounded to produce a uniform radius at the circumference of the intersection. The thickness of the lining material shall be no less than 1/2-inch on the bench at the invert, and shall increase in the direction of the wall to provide the required slope as shown on the Standard Details.

## PART 9 - CURING

Caution shall be taken to minimize exposure of the applied lining to sunlight and air movement. If the second application is to be made longer than 15 minutes after completion of the first application, the substrate shall be covered. At no time shall the finished product be exposed to sunlight or air movement for longer than 15 minutes before replacing the manhole cover.

The final application shall have a minimum of four (4) hours cure time before being subjected to active flow. Traffic shall not be allowed over substrates for 24 hours after lining is complete.

## PART 10 – BENCH REPAIRS

Bench repairs shall be performed at those manholes noted on the project plans. Any manhole inspected by the Contractor and deemed to require bench repair work shall be

approved by the Owner or Engineer prior to performing the work.

Bench repair work shall include but not be limited to the following:

- (a) Controlling sewer flow through manhole as required to perform the work.
- (b) Cleaning the existing surface to remove loose materials and debris prior to performing work.
- (c) Adding necessary materials to promote channelized, smooth flow across the manhole bench and to prevent collection of sewer wastes on bench.
- (d) All bench repair work shall be performed prior to manhole lining operations.

## PART 11 – CASTING REPLACEMENTS & INFLOW DISHES

11.01 Casting Replacements: The following procedure shall be carried out for each manhole noted for casting replacement on the project plans.

- (a) Measure the existing manhole and casting as needed to ensure safety and a positive seal for the new casting.
- (b) Unless otherwise noted on the Plans, replace the existing casting with Model R-1736-A as manufactured by Neenah Foundry Company, or engineer approved equal.
- (c) Return the existing casting to the Owner.

11.02 Inflow Dishes: The following procedure shall be carried out for each manhole noted for inflow cover on the Plans.

- (a) Measure the existing manhole casting as required by the inflow dish manufacturer to ensure a positive seal for the new casting.
- (b) Clean the existing casting prior to measuring and installation of the inflow dish to ensure a good fit.
- (c) Install Cretex Inflow Dish, as manufactured by Cretex Specialty Products, or engineer approved equal.

## PART 12 - PRODUCT TESTING

Three (3) 2-inch cubes shall be cast each day from every product used, and shall be properly labeled and sent to the manufacturer or an approved laboratory for testing in accordance with the manufacturer's directions. The manufacturer or laboratory shall perform compressive strength testing as described in ASTM C-109.

## PART 13 – WARRANTY

All work associated with this section shall be covered by a two year contract warranty against defective materials or workmanship.

## PART 14 - MANHOLE INSPECTIONS & TESTING

14.01 Manholes that have undergone rehabilitation shall be inspected after completion and within the guarantee period. Leakage and other defects resulting from the Contractor's work shall be eliminated and repaired by the Contractor as required by the Engineer, at the Contractor's expense.

14.02 Manholes that have been rehabilitated utilizing full-depth, spray applied cementitious manhole lining products, shall be subjected to vacuum testing as per ASTM C1244-93. Vacuum testing shall not be conducted earlier than 7 days after application of products. Any manhole which does not pass the vacuum test shall be repaired by the Contractor at no additional expense to the Owner and shall be retested. No installation shall be accepted until the vacuum test is successful.

## PART 15 - WEATHER

No application of liner shall be made to surfaces with ambient temperature, 40°F or if freezing is expected to occur inside the substrate within 24 hours after the application. If ambient temperatures are in excess of 95 degrees Fahrenheit, precautions shall be taken to keep the mix temperature at the time of application below 80 degrees Fahrenheit. Mix water temperature shall not exceed 85 degrees Fahrenheit. Chill water with ice, if necessary.

END OF SECTION

## SECTION 03001

### MANHOLE GRADE ADJUSTMENT

#### PART 1 – GENERAL

##### 1.01 MANHOLE GRADE ADJUSTMENT RINGS

All grade adjustments of manhole frame and cover assemblies shall be completed utilizing brick and mortar, reinforced concrete grade rings, or injection molded High Density Polyethylene (HDPE) adjustment rings as manufactured by Ladtech, Inc. or approved equal. Existing manholes shall be adjusted no more than 18" utilizing adjustment rings.

Following installation of adjustment rings or brick, the internal circumference of the raised section (from the interface with the manhole corbel through the casting joint) shall be sealed with a non-shrink grout or cement. If the manhole is located in a non-traffic area and the final grade of the casting is greater than 4" above finished grade, the Contractor shall also seal the outer circumference of the manhole with a non-shrink grout or cement.

#### A. Reinforced Concrete Grade Adjustment Rings

1. Precast reinforced concrete grade adjustment rings shall conform to ASTM C478 and shall be free from cracks, voids, and other defects.
2. The adjustment rings shall be tested to assure compliance with impact and loading requirements per AASHTO's Standard Specification for Highway Bridges.
3. Installation shall be according to manufacturer's recommendations and the following procedure:
  - a. Clean the concrete cone or top slab with a whiskbroom or chisel to assure a flat seating surface free of rocks, gravel, blacktop and protruding concrete, frozen or other debris.
  - b. Measure the distance from the cone or top slab to the projected finish grade and deduct for the cover frame. Determine the net buildup of rings necessary to come within ¼" of grade with the cover frame in place.

- c. Determine the best ring height combination to attain necessary adjustment.
- d. Use mortar to create a flat sealable surface if the cone or top slab is too badly chipped or damaged to attain a good seal. Apply two strips of approved butyl gasket material to the cone or top slab around the entire circumference, overlapping the ends.
- e. Place the first ring down onto the cone or top slab.
- f. Apply two strips of approved butyl gasket material to the top of the first grade ring around the entire circumference, overlapping the ends.
- g. Place the second ring down onto the first ring.
- h. Continue the assembly per steps f and g for each adjustment ring being used. A maximum height of 18" is permitted for adjustment rings.
- i. Prior to setting the cover frame in place, apply two strips of approved butyl gasket material to the last rings around the entire circumference, overlapping the ends.
- j. Set the cover frame in place, centered on the top ring.
- k. Where the manhole is located in pavement, use precast concrete rings in conjunction with HDPE rings to match the roadway cross slope.

1.02 HIGH DENSITY POLYETHYLENE GRADE ADJUSTMENT RINGS

- A. Plastic adjustment rings shall be manufactured from Polyethylene plastic as identified in ASTM D1248 (Standard Specification for Polyethylene Plastic Molding and Extrusion Materials). Material properties shall be tested and qualified for usage per the ASTM Test Methods reference in ASTM D1248. Recycled material meeting the above requirement may be used.
- B. Plastic adjustment rings shall be manufactured utilizing the injection molding process as defined by the Society of Plastic Engineers (SPE).

- C. The adjustment rings shall be tested to assure compliance with impact and loading requirements per AASHTO's Standard Specification for Highway Bridges. Adjustment rings shall be tested and accepted for HS-25 loading.
- D. Installation shall be according to manufacturer's recommendations and the following procedure:
1. Clean the concrete cone or top slab with a whiskbroom or chisel to assure a flat seating surface free of rocks, gravel, asphalt, protruding concrete, frozen or other debris.
  2. Measure the distance from the cone or top slab to the projected finish grade and deduct for the cover frame. Determine the net buildup of rings necessary to come within ¼" of grade with the cover frame in place.
  3. Determine the best ring height combination to attain necessary adjustment. Molded slope rings shall be used to match grades of paved surfaces that are not flat. Molded slope rings shall be used to accommodate other grades that are not flat only when directed by the Engineer.
  4. Dry stack rings on cone. Index any slope rings as necessary. Place cover frame casting on top of the assembly and verify height and slope match.
  5. Mark the entire stack with a vertical line and disassemble.
  6. Use mortar to create a flat sealable surface if the cone or top slab is too badly chipped or damaged to attain a good seal. Apply a 3/8" of approved butyl rope to the cone or top slab. (A 1" x 1" butyl material strip should be used if the cone is rough or irregular).
  7. Place the first ring down onto the cone or top slab with the male lip into the opening, aligning the vertical line.
  8. Apply a 3/8" bead of approved butyl rope on the bottom of the next ring, as close to the male lip as possible around the entire 360° of the ring.
  9. Place the second ring down onto the first ring with the male lip interlocking into the center, aligning the vertical line.

10. Continue the assembly per steps 8 and 9 for each adjustment ring being used. A maximum height of 18" is permitted for adjustment rings.
  11. Prior to setting the cover frame in place, apply 1 – 1" by 1" inch bead of approved butyl sealant on top of the last ring. Apply the sealant in a location to contact the cover frame the full 360°.
  12. Set the cover frame in place, centered on the top ring. Apply sufficient butyl rubber to achieve 10" vacuum test if required.
- E. All HDPE adjustment rings shall be covered by a full two year warranty that warrants the adjustment rings for two years from the date of installation against defects in materials. Any defective adjustment rings shall be replaced at no cost to the Owner.

END OF SECTION

## SECTION 15110

### VALVES & VALVE ACTUATORS

#### PART 1 – GENERAL

1.01 GENERAL – This section of the Specifications covers all valves and valve actuators shown on the Project Drawings.

#### 1.02 SUBMITTALS

- A. General – Submit six (6) copies each of the manufacturer's data sheets and operation and maintenance information as described herein to the Engineer.
- B. Manufacturer's Data Sheets – Submit manufacturer's data sheets for each of the products specified herein to the Engineer for approval. Highlight or otherwise distinguish that data that applies specifically to the products subject to approval. Provide certification on each submittal stating that the product information has been reviewed and that the product that will be used in the Work will comply with the requirements of the specifications. Provide date and signature with each certification statement.

#### 1.03 PRODUCT HANDLING

- A. Delivery and Storage – Materials shall be handled in a manner complying with the recommendations of the manufacturer. Materials shall be stored in an organized manner at a location that will not interfere with the Work. Mechanical and Electrical equipment shall be stored in an area protected from the elements in order to exclude moisture.
- B. Protection – Take appropriate measures to protect stored materials from the potential of damage from ongoing activities adjacent to the storage area.
- C. Replacement – Replace materials damaged during shipment, handling, or storage prior to installation. Such replacements shall be made at no additional cost to the Owner.

#### 1.04 WARRANTY

- A. General – All Work associated with this section shall be covered by the standard one year contract warranty in accordance with requirements of the General Conditions.
- B. Equipment – All mechanical and electrical equipment installed as part of the Work shall be covered by a full manufacturer's warranty for a minimum period of one (1) year after the acceptance of the installation by the Engineer.

#### PART 2 – MATERIALS AND EQUIPMENT

##### 2.01 GATE VALVES

- A. Use resilient wedge gate valves complying with AWWA C509 with a non-rising stem, double O-ring seal stuffing box and iron body with epoxy coated interior surfaces complying with AWWA C550. Working pressure of 250 psi designed to

work equally well with pressure on either side of the gate. Use Mueller Series 2300 or approved other. Tapping valves shall be flanged x mechanical joint.

- B. Provide connections as required for the piping in which they are installed.

## 2.02 PLUG VALVES

- A. Provide eccentric plug valves (16" minimum size) of the non-lubricated eccentric type with resilient faced plugs furnished with flanged (above grade) and mechanical joint (below grade) end connections. Flanged valves shall be faced and drilled to the ANSI 125 lb. Standard.
- B. The valve body shall be of ASTM A126 Class B cast iron and shall be furnished with a 1/8" welded overlay seat of not less than 90% pure nickel. Seat area shall be raised with raised surface completely covered with weld to insure that the plug face contacts only nickel. Screwed-in seats shall not be acceptable.
- C. The plug shall be of ASTM A126 Class B cast iron and shall have a cylindrical seating surface eccentrically offset from the center of the plug shaft. The interference between the plug face and body seat, with the plug in the closed position, shall be eternally adjustable in the field with the valve in the line under pressure. Plug shall be Chloroprene (CR) or resilient facing suitable for the application.
- D. The bearings shall have sleeve type metal bearings and shall be of sintered, oil impregnated permanently lubricated type 316 ASTM A743 Grade CF8M. Non-metallic bearings shall not be acceptable.
- E. The shaft seals shall be of the multiple V-ring type and shall be externally adjustable and repackable without removing the actuator or bonnet from the valve under pressure. Valves utilizing O-ring seals or non-adjustable packing shall not be acceptable.
- F. Pressure ratings shall be 175 psi and valve shall be given a hydrostatic and seat test with results being certified.
- G. All valve components shall conform to Underwriters Laboratories classification in accordance with ANSI / NSF Standard 61.
- H. Plug valve shall be PEC Eccentric Plug Valve as manufactured by DeZurik or Engineer approved equal.

## 2.03 BUTTERFLY VALVES

- A. Provide butterfly valves that meet or exceed the latest revision of AWWA Standard C504 for Class 150B butterfly valves and that meet or exceed the requirements of this specification.
- B. Butterfly valves shall have a working pressure of 200-psi and shall be tested at and shall be capable of withstanding bi-directional line hydrostatic test pressures up to 225-psi without leaking.
- C. All valve components shall conform to Underwriters Laboratories classification in accordance with ANSI/NSF Standard 61.

- D. Valve bodies shall be of cast iron per ASTM A126 Class B. Flange end valves shall be of the short body design with 125 lb. flanged ends faced and drilled per ANSI B16.1 standard for cast iron flanges. Mechanical Joint end valves shall meet the requirements of AWWA C111/ANSI 21.11.
- E. Discs shall be offset to provide an uninterrupted 360 degree seating edge and shall be cast iron per ASTM A48, Class 40C. The disc seating edge shall be solid 316 stainless steel. Sprayed mating seating surfaces are not acceptable. The disc shall be securely attached to the valve shaft utilizing a field removable/replaceable 316 stainless steel torque screw on sizes 3 - 12" (80 - 300mm) or a tangential pin locked in place with a set screw on sizes 14 - 20" (350 - 500mm).
- F. Valve shaft shall be type 304 stainless steel. Valve shaft seals shall be self-compensating V-type packing with a minimum of four sealing rings. One-piece molded shaft seals and o-ring shaft seals are not acceptable.
- G. The seat shall be of Buna-N for water, or as required for other services, and shall be molded in and vulcanized to the valve body. The seat shall contain an integral shaft seal protecting the valve bearings and packing from any line debris. Seats vulcanized to cartridge inserts in the valve body and seats on the disc are not acceptable.
- H. Valve shaft bearings shall be non-metallic and permanently lubricated.
- I. Unless otherwise specified, exterior and interior metallic surfaces of each valve shall be shop painted per the latest revision of AWWA C504. The interior of the body shall have a full rubber lining vulcanized to the valve body. Mechanical Joint valves shall be fully rubber lined to point of pipe insertion. Rubber lining on the flange face and boot style seats are not acceptable.
- J. If the actual valve operating conditions are provided within this specification, the valve actuator shall be sized to the specified conditions. If actual operating conditions are not provided within this specification, per AWWA C504, the valve actuator shall be sized to operate the valve at the rated working conditions of the valve. Each valve and valve actuator shall be assembled, adjusted, and tested as a unit per the latest revision of AWWA C504, by the valve manufacturer. Shop leakage tests shall follow the requirements of AWWA C504 except that the test pressure shall be 225 psi (1550 kPa).
- K. AWWA C504 Butterfly valves shall be DeZURIK BAW or approved equal.
- L. Butterfly valves shall be AWWA Butterfly Valves (BAW) as manufactured by DeZurik or Engineer approved equal

#### 2.04 CHECK VALVES

- A. Provide wafer swing check valves with a spring-assisted closure that minimizes the possibility of water hammer.
- B. The valve body shall be of cast iron complying with ASTM A48
- C. Valve trim shall be 316 stainless steel complying with ASTM A23.
- D. For corrosion resistance the valve shall be Electroless-Nickel Plated.

- E. Wafer swing check valves shall be Series 501A as manufactured by Cla-Val or Engineer approved equal

#### 2.05 ELECTRIC MOTOR ACTUATORS

- A. Basic Actuator – The electric valve actuator shall include the motor, actuator unit gearing, limit switch gearing, limit switches, torque switches, declutch lever, and manual handwheel as a complete self-contained unit. All actuators shall meet the latest revisions of AWWA specifications C504 and C540.
- B. Enclosures – The valve actuator motor and all electrical enclosures shall be NEMA 4 (weatherproof/ watertight) and NEMA 6 temporary submersion (minimum of 3 meters for 48 hours).
- C. Motor – The motor shall be specifically designed for valve actuator service and shall be of high starting torque, totally enclosed, non-ventilated construction. Motor insulation shall be a minimum of NEMA Class F, with a maximum continuous temperature rating of 155 degrees C (rise plus ambient) for the duty cycle specified. Optional insulation classes are available if service conditions warrant.

The motor shall be of sufficient size to open or close the valve at the maximum stated torque. The motor shall be capable of operating at plus or minus 10% of the specified voltage. The motor duty rating shall be sufficient for three complete cycles (open-close-open 3 times) without exceeding its temperature rating. Motor bearings shall be of the anti-friction type, and permanently lubricated.

The motor shall be an independent sub-assembly such that the power gearing shall not be an integral part of the motor assembly, to allow for motor or gear changes dictated by system operation requirements. The motor must be capable of being removed in its entirety for repair and testing. The use of a motor cast integral to the actuator body is not permitted.

The motor shall be equipped with internal thermal contacts to protect against motor overload and the motor shall be equipped with 120-volt AC/DC heaters of 10 watt minimum size.

AC motors shall be rated as a minimum for a 15 minute duty cycle

- D. Power Gearing – The actuator shall be a multiple reduction unit with power gearing consisting of spur, helical, or bevel gears, and worm gearing. The spur, helical, or bevel gearing and worm shall be of hardened alloy steel, and the worm gear shall be alloy bronze. All gearing shall be accurately cut. Non-metallic, aluminum, compressed powdered metal, and cast gearing shall not be allowed. Anti-friction rolling element bearings shall be used throughout and shall support both ends of all rotating parts.
- E. Lubrication – All rotating power train components shall be immersed in grease with provisions for inspection and re-lubrication without disassembly. Lubricants shall be suitable for ambient conditions of minus 20°F to 150°F. Adequate seals shall be provided on all shafting. The use of oil as a lubricant is not permitted.
- F. Self-Locking Feature – Actuator gearing must be self-locking. The use of non-locking gearing and motor brakes is not permitted. The actuator must keep the valve in position with the motor removed without the need for special considerations.

- G. Manual Operation – A metallic handwheel shall be provided for manual operation with an arrow to indicate the open rotation. The handwheel shall not rotate during motor operation. A fused motor shall not prevent manual operation. When in the manual operating mode, the actuator will remain in this mode until the motor is energized, at which time the actuator will automatically return to electric operation. Movement from motor operation to handwheel operation shall be accomplished by a positive padlockable declutch lever which mechanically disengages the motor and related gearing. It shall be impossible for simultaneous manual and motor operation to occur. Friction type declutch mechanisms are not acceptable. Rim pull on the manual handwheel when the valve is fully seated shall not exceed 80 pounds
- H. Position Limit Switches – Position limit switches and the associated counter gearing shall be an integral part of the valve actuator. Limit switch gearing shall be of the intermittent type, made of bronze or stainless steel, grease lubricated, and totally enclosed to prevent dirt and foreign matter from entering the gear train. Switches shall be adjustable, allowing for trip points from fully open to fully closed positions of valve travel. They shall not be subject to breakage or slippage due to over-travel. Limit switches shall be heavy duty, silver plated with wiping action. The actuator shall have 16 contacts, 4 contacts for each of 4 rotors, all of the same design. Contacts shall be convertible from N/O to N/C in the field. Switch design shall permit visual verification of switch position without disassembly.
- Limit switches that rely on the counting of electrical pulses, those that must rely on battery backup, or those that are not mechanical in nature are not permitted.
- I. Torque Switch – Each valve actuator shall be equipped with a switch that will interrupt the control circuit in both the opening and closing directions when valve torque overload occurs or when valves require torque seating in the closed or open position. Contacts shall be silver plated. The torque switch shall have graduated dials for both open and close directions of travel and each shall be independently adjustable, with a positive means to limit the adjustability so as not to exceed the actuator output torque capability.
- J. Control Compartment Heater – The control compartment shall be provided with a 120 volt AC space heater.
- K. Electric Motor Controls – The motor controls are to be supplied integral to the actuator this includes a reversing motor starter, control transformer, and all necessary terminal strips. The control transformer shall have fuses on both primary legs, have a secondary leg grounded, and have a fuse on the other secondary leg. Wiring shall be hard wired point to point without any proprietary circuit boards, plug in components, or other equipment. All points for customer wiring shall go directly to terminal strips. The motor controls are to be readily accessible and completely visible with the electrical compartment cover removed. The intent is to make all controls accessible and simple to understand. All control wiring shall either be labeled at each end or color coded (to match wiring diagram).
- L. Control Station – The actuator shall be equipped with a local close coupled control station. This station will have a 3 position selector switch (open-run-close), 2 LED indicating lights (open-close), and a 3 position padlockable selector switch (local-off-remote).

- M. Modulating Controls – The actuator shall be equipped with a positioning circuit that will position the valve proportionally to a 4 to 20 mA input signal. This device will have adjustments for proportional gain, zero, span, and deadband.
- N. Gearing for Quarter-Turn Valves – The use of bolt on worm gear reducers for quarter-turn valves is required. This gearing will meet the AWWA C540 requirements.
- O. Vendor Responsibility – In the case that an electric actuator is demonstrated to be sized to small; the vendor shall promptly modify the actuator or replace it with a larger unit at no cost to the Owner. If the actuator is shipped separate from the valve or if it is removed during construction, a factory trained service technician employed by the actuator manufacturer or one of the actuator's formally recognized service facilities shall perform startup and calibration on the equipment at no cost to the Owner. If the actuator is shipped assembled to the valve it shall be calibrated and tested at the valve manufacturer's facility, the actuator's manufacturer's facility, or one of their formally recognized service facilities. All setup and calibration shall be documented and submitted to the Engineer.
- P. Startup – Startup and training by a factory trained service technician employed by the actuator manufacturer or one of their formally recognized facilities will be required at no cost to the Owner.
- Q. Actuator – Electric Actuator shall be a Limitorque L120 series with PTA worm gear or Engineer approved equal.

### PART 3 – EXECUTION

- 3.01 INSTALLATION – Install valves and piping in accordance with the manufacturer's recommendations and industry recognized standards. All piping and valves shall be installed plumbed and leveled. Bolts shall be installed to the proper torque.

END OF SECTION

KyTC BMP Plan for Project PCN ## - #####



**Kentucky Transportation Cabinet**

**Highway District 2 (1)**

**And**

\_\_\_\_\_ **(2), Construction**

**Kentucky Pollutant Discharge Elimination System**

**Permit KYR10**

**Best Management Practices (BMP) plan**

**Groundwater protection plan**

**For Highway Construction Activities**

**For**

**IMPROVEMENTS TO KY 3052 (COLLEGE DRIVE**

**FROM COLLEGE HEIGHTS TO US 42 (NORTH**

**MAIN STREET)**

**Project: PCN ## - #####**

## KyTC BMP Plan for Project PCN ## - ####

### Project information

Note – (1) = Design (2) = Construction (3) = Contractor

1. Owner – Kentucky Transportation Cabinet, District 2
2. Resident Engineer: (2)
3. Contractor name: (2)  
Address: (2)  
  
Phone number: (2)  
Contact: (2)  
Contractors agent responsible for compliance with the KPDES permit requirements (3):
4. Project Control Number (2)
5. Route (Address) : KY 3052
6. Latitude/Longitude (project mid-point) dd/mm/ss, dd/mm/ss:  
  
Lat: 37/21/49, Long: 87/30/11
7. County (project mid-point): HOPKINS
8. Project start date (date work will begin): (2)
9. Projected completion date: (2)

## KyTC BMP Plan for Project PCN ## - ####

### A. Site description:

1. Nature of Construction Activity (from letting project description):  
improvements to KY 3052 from College Heights to US 41
2. Order of major soil disturbing activities (2) and (3)
3. Projected volume of material to be moved : 5,653 C. Y.(1)
4. Estimate of total project area (acres) : 13.41 acres(1)
5. Estimate of area to be disturbed (acres) : 9.67 acres(1)
6. Post construction runoff coefficient will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information.
7. Data describing existing soil condition: See Geotech report if available. See Roadway Plans(1) & (2)
8. Data describing existing discharge water quality (if any): (1) & (2)
9. Receiving water name: N/A(1)
10. TMDLs and Pollutants of Concern in Receiving Waters: N/A(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 ,wetlands, organic enrichment, nutrient and dissolved oxygen.
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

## KyTC BMP Plan for Project PCN ## - #####

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. All DDA's will have adequate BMP's in place before being disturbed.
3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:
  - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
  - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be

## KyTC BMP Plan for Project PCN ## - ####

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

## KyTC BMP Plan for Project PCN ## - ####

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 : Seeding and Protection, Erosion Control Blanket, Grassed Waterways (1)

### **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.

## KyTC BMP Plan for Project PCN ## - #####

### ➤ **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

## KyTC BMP Plan for Project PCN ## - #####

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.

## KyTC BMP Plan for Project PCN ## - ####

- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact 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. (1)

### **E. Maintenance**

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.
- Maintenance of BMPs during construction shall be a result of weekly and post rain event inspections with action being taken by the contractor to correct deficiencies.
  - Post Construction maintenance will be a function of normal highway maintenance operations. Following final project acceptance by the cabinet, district highway crews will be responsible for identification and correction of deficiencies regarding ground cover and cleaning of storm water BMPs. The project manager shall identify any BMPs that will be for the purpose of post construction storm water management with specific guidance for any non-routine maintenance. (1)

## KyTC BMP Plan for Project PCN ## - #####

### **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:

## KyTC BMP Plan for Project PCN ## - #####

- Water from water line flushings.
- Water from cleaning concrete trucks and equipment.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
- 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);

## KyTC BMP Plan for Project PCN ## - #####

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.)







STEVEN L. BESHEAR  
GOVERNOR

LEONARD K. PETERS  
SECRETARY

**ENERGY AND ENVIRONMENT CABINET**  
DEPARTMENT FOR ENVIRONMENTAL PROTECTION  
DIVISION OF WATER  
200 FAIR OAKS LANE, 4TH FLOOR  
FRANKFORT, KENTUCKY 40601  
[www.kentucky.gov](http://www.kentucky.gov)

July 25, 2014

Joseph McClearn  
KY 3052 - Hopkins Co  
1840 N Main St  
Madisonville, KY 42431

Re: KYR10 Coverage Acknowledgment  
KPDES No.: KYR10I625  
KY 3052 (College Drive) Widening  
Permit Type: Construction  
AI ID: 123267  
Hopkins County, Kentucky

Dear Joseph McClearn:

The discharges associated with the Notice of Intent you submitted have been approved for coverage under the "Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Stormwater Discharges Associated with Construction Activities (KYR10)" permit. This coverage becomes effective the date of this correspondence and will remain effective until the general permit expires or the Division of Water revokes coverage. During this period of coverage all discharges shall comply with the conditions of the applicable general permit. A copy of the general permit the operator is now covered by can be found on our website: <http://water.ky.gov>.

Any questions concerning the general permit and its requirements should be directed to me at (502) 564-3410.

Facility Site: 37.3636, -87.5031

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn Hokanson".

**Shawn Hokanson**  
Surface Water Permits Branch  
Division of Water

**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 2012* and *Standard Drawings, Edition of 2012 with the 2012 Revision*.

**Supplemental Specifications to the  
Standard Specifications for Road and Bridge Construction, 2012 Edition  
Effective with the August 22, 2014 Letting**

<b>Subsection:</b>	102.15 Process Agent.
<b>Revision:</b>	Replace the 1st paragraph with the following: Every corporation doing business with the Department shall submit evidence of compliance with KRS Sections 14A.4-010, 271B.11-010, 271B.11-070, 271B.11-080, 271B.5-010 and 271B.16-220, and file with the Department the name and address of the process agent upon whom process may be served.
<b>Subsection:</b>	105.13 Claims Resolution Process.
<b>Revision:</b>	Delete all references to TC 63-34 and TC 63-44 from the subsection as these forms are no longer available through the forms library and are forms generated within the AASHTO SiteManager software.
<b>Subsection:</b>	108.03 Preconstruction Conference.
<b>Revision:</b>	Replace 8) Staking with the following: 8) Staking (designated by a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
<b>Subsection:</b>	109.07.02 Fuel.
<b>Revision:</b>	Revise item Crushed Aggregate Used for Embankment Stabilization to the following: Crushed Aggregate Used for Stabilization of Unsuitable Materials Used for Embankment Stabilization
	Delete the following item from the table. <del>Crushed Sandstone Base (Cement Treated)</del>
<b>Subsection:</b>	110.02 Demobilization.
<b>Revision:</b>	Replace the first part of the first sentence of the second paragraph with the following: Perform all work and operations necessary to accomplish final clean-up as specified in the first paragraph of Subsection 105.12;
<b>Subsection:</b>	112.03.12 Project Traffic Coordinator (PTC).
<b>Revision:</b>	Replace the last paragraph of this subsection with the following: Ensure the designated PTC has sufficient skill and experience to properly perform the task assigned and has successfully completed the qualification courses.
<b>Subsection:</b>	112.04.18 Diversions (By-Pass Detours).
<b>Revision:</b>	Insert the following sentence after the 2nd sentence of this subsection. The Department will not measure temporary drainage structures for payment when the contract documents provide the required drainage opening that must be maintained with the diversion. The temporary drainage structures shall be incidental to the construction of the diversion. If the contract documents fail to provide the required drainage opening needed for the diversion, the cost of the temporary drainage structure will be handled as extra work in accordance with section 109.04.
<b>Subsection:</b>	201.03.01 Contractor Staking.
<b>Revision:</b>	Replace the first paragraph with the following: Perform all necessary surveying under the general supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.

**Supplemental Specifications to the  
Standard Specifications for Road and Bridge Construction, 2012 Edition  
Effective with the August 22, 2014 Letting**

<b>Subsection:</b>	201.04.01 Contractor Staking.
<b>Revision:</b>	Replace the last sentence of the paragraph with the following: Complete the general layout of the project under the supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
<b>Subsection:</b>	206.04.01 Embankment-in-Place.
<b>Revision:</b>	Replace the fourth paragraph with the following: The Department will not measure <b>suitable</b> excavation included in the original plans that is disposed of for payment and will consider it incidental to Embankment-in-Place.
<b>Subsection:</b>	208.02.01 Cement.
<b>Revision:</b>	Replace paragraph with the following: Select Type I or Type II cement conforming to Section 801. Use the same type cement throughout the work.
<b>Subsection:</b>	208.03.06 Curing and Protection.
<b>Revision:</b>	Replace the fourth paragraph with the following: Do not allow traffic or equipment on the finished surface until the stabilized subgrade has cured for a total of 7-days with an ambient air temperature above 40 degrees Fahrenheit. A curing day consists of a continuous 24-hour period in which the ambient air temperature does not fall below 40 degrees Fahrenheit. Curing days will not be calculated consecutively, but must total seven (7) , 24-hour days with the ambient air temperature remaining at or above 40 degrees Fahrenheit before traffic or equipment will be allowed to traverse the stabilized subgrade. The Department may allow a shortened curing period when the Contractor requests. The Contractor shall give the Department at least 3 day notice of the request for a shortened curing period. The Department will require a minimum of 3 curing days after final compaction. The Contractor shall furnish cores to the treated depth of the roadbed at 500 feet intervals for each lane when a shortened curing time is requested. The Department will test cores using an unconfined compression test. Roadbed cores must achieve a minimum strength requirement of 80 psi.
<b>Subsection:</b>	208.03.06 Curing and Protection.
<b>Revision:</b>	Replace paragraph eight with the following: At no expense to the Department, repair any damage to the subgrade caused by freezing.
<b>Subsection:</b>	212.03.03 Permanent Seeding and Protection.
<b>Part:</b>	A) Seed Mixtures for Permanent Seeding.
<b>Revision:</b>	Revise <b>Seed Mix Type I</b> to the mixture shown below: 50% Kentucky 31 Tall Fescue (Festuca arundinacea) 35% Hard Fescue (Festuca (Festuca longifolia) 10% Ryegrass, Perennial (Lolium perenne) 5% White Dutch Clover (Trifolium repens)
<b>Subsection:</b>	212.03.03 Permanent Seeding and Protection.
<b>Part:</b>	A) Seed Mixtures for Permanent Seeding.
<b>Number:</b>	2)
<b>Revision:</b>	Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 4, 5, 6, and 7. Apply seed mix Type II at a minimum application rate of 100 pounds per acre. If adjacent to a golf course replace the crown vetch with Kentucky 31 Tall Fescue.

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<b>Subsection:</b>	212.03.03 Permanent Seeding and Protection.
<b>Part:</b>	A) Seed Mixtures for Permanent Seeding.
<b>Number:</b>	3)
<b>Revision:</b>	Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 1, 2, 3, 8, 9, 10, 11, and 12. Apply seed mix Type III at a minimum application rate of 100 pounds per acre. If adjacent to crop land or golf course, replace the Sericea Lespedeza with Kentucky 31 Fescue.
<b>Subsection:</b>	212.03.03 Permanent Seeding and Protection.
<b>Part:</b>	B) Procedures for Permanent Seeding.
<b>Revision:</b>	Delete the first sentence of the section.
<b>Subsection:</b>	212.03.03 Permanent Seeding and Protection.
<b>Part:</b>	B) Procedures for Permanent Seeding.
<b>Revision:</b>	Replace the second and third sentence of the section with the following: Prepare a seedbed and apply an initial fertilizer that contains a minimum of 100 pounds of nitrogen, 100 pounds of phosphate, and 100 pounds of potash per acre. Apply agricultural limestone to the seedbed when the Engineer determines it is needed. When required, place agricultural limestone at a rate of 3 tons per acre.
<b>Subsection:</b>	212.03.03 Permanent Seeding and Protection.
<b>Part:</b>	D) Top Dressing.
<b>Revision:</b>	Change the title of part to D) Fertilizer.
<b>Subsection:</b>	212.03.03 Permanent Seeding and Protection.
<b>Part:</b>	D) Fertilizer.
<b>Revision:</b>	Replace the first paragraph with the following: Apply fertilizer at the beginning of the seeding operation and after vegetation is established. Use fertilizer delivered to the project in bags or bulk. Apply initial fertilizer to all areas prior to the seeding or sodding operation at the application rate specified in 212.03.03 B). Apply 20-10-10 fertilizer to the areas after vegetation has been established at a rate of 11.5 pounds per 1,000 square feet. Obtain approval from the Engineer prior to the 2nd fertilizer application. Reapply fertilizer to any area that has a streaked appearance. The reapplication shall be at no additional cost to the Department. Re-establish any vegetation severely damaged or destroyed because of an excessive application of fertilizer at no cost to the Department.
<b>Subsection:</b>	212.03.03 Permanent Seeding and Protection.
<b>Part:</b>	D) Fertilizer.
<b>Revision:</b>	Delete the second paragraph.
<b>Subsection:</b>	212.04.04 Agricultural Limestone.
<b>Revision:</b>	Replace the entire section with the following: The Department will measure the quantity of agricultural limestone in tons.
<b>Subsection:</b>	212.04.05 Fertilizer.
<b>Revision:</b>	Replace the entire section with the following: The Department will measure fertilizer used in the seeding or sodding operations for payment. The Department will measure the quantity by tons.

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<b>Subsection:</b>	212.05 PAYMENT.												
<b>Revision:</b>	Delete the following item code: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Code</u></th> <th style="text-align: left;"><u>Pay Item</u></th> <th style="text-align: left;"><u>Pay Unit</u></th> </tr> </thead> <tbody> <tr> <td>05966</td> <td>Topdressing Fertilizer</td> <td>Ton</td> </tr> </tbody> </table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	05966	Topdressing Fertilizer	Ton						
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05966	Topdressing Fertilizer	Ton											
<b>Subsection:</b>	212.05 PAYMENT.												
<b>Revision:</b>	Add the following pay items: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Code</u></th> <th style="text-align: left;"><u>Pay Item</u></th> <th style="text-align: left;"><u>Pay Unit</u></th> </tr> </thead> <tbody> <tr> <td>05963</td> <td>Initial Fertilizer</td> <td>Ton</td> </tr> <tr> <td>05964</td> <td>20-10-10 Fertilizer</td> <td>Ton</td> </tr> <tr> <td>05992</td> <td>Agricultural Limestone</td> <td>Ton</td> </tr> </tbody> </table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	05963	Initial Fertilizer	Ton	05964	20-10-10 Fertilizer	Ton	05992	Agricultural Limestone	Ton
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05964	20-10-10 Fertilizer	Ton											
05992	Agricultural Limestone	Ton											
<b>Subsection:</b>	213.03.02 Progress Requirements.												
<b>Revision:</b>	Replace the last sentence of the third paragraph with the following: Additionally, the Department will apply a penalty equal to the liquidated damages when all aspects of the work are not coordinated in an acceptable manner within 7 calendar days after written notification.												
<b>Subsection:</b>	213.03.05 Temporary Control Measures.												
<b>Part:</b>	E) Temporary Seeding and Protection.												
<b>Revision:</b>	Delete the second sentence of the first paragraph.												
<b>Subsection:</b>	304.02.01 Physical Properties.												
<b>Table:</b>	Required Geogrid Properties												
<b>Revision:</b>	Replace all references to Test Method "GRI-GG2-87" with ASTM D 7737.												
<b>Subsection:</b>	402.03.02 Contractor Quality Control and Department Acceptance.												
<b>Part:</b>	B) Sampling.												
<b>Revision:</b>	Replace the second sentence with the following: The Department will determine when to obtain the quality control samples using the random-number feature of the mix design submittal and approval spreadsheet. The Department will randomly determine when to obtain the verification samples required in Subsections 402.03.03 and 402.03.04 using the Asphalt Mixture Sample Random Tonnage Generator.												
<b>Subsection:</b>	402.03.02 Contractor Quality Control and Department Acceptance.												
<b>Part:</b>	D) Testing Responsibilities.												
<b>Number:</b>	3) VMA.												
<b>Revision:</b>	Add the following paragraph below Number 3) VMA: Retain the AV/VMA specimens and one additional corresponding $G_{mm}$ sample for 5 working days for mixture verification testing by the Department. For Specialty Mixtures, retain a mixture sample for 5 working days for mixture verification testing by the Department. When the Department's test results do not verify that the Contractor's quality control test results are within the acceptable tolerances according to Subsection 402.03.03, retain the samples and specimens from the affected subplot(s) for the duration of the project.												
<b>Subsection:</b>	402.03.02 Contractor Quality Control and Department Acceptance.												
<b>Part:</b>	D) Testing Responsibilities.												
<b>Number:</b>	4) Density.												
<b>Revision:</b>	Replace the second sentence of the Option A paragraph with the following: Perform coring by the end of the following work day.												

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<b>Subsection:</b>	402.03.02 Contractor Quality Control and Department Acceptance.
<b>Part:</b>	D) Testing Responsibilities.
<b>Number:</b>	5) Gradation.
<b>Revision:</b>	Delete the second paragraph.
<b>Subsection:</b>	402.03.02 Contractor Quality Control and Department Acceptance.
<b>Part:</b>	H) Unsatisfactory Work.
<b>Number:</b>	1) Based on Lab Data.
<b>Revision:</b>	Replace the second paragraph with the following: When the Engineer determines that safety concerns or other considerations prohibit an immediate shutdown, continue work and the Department will make an evaluation of acceptability according to Subsection 402.03.05.
<b>Subsection:</b>	402.03.03 Verification.
<b>Revision:</b>	Replace the first paragraph with the following: <b>402.03.03 Mixture Verification.</b> For volumetric properties, the Department will perform a minimum of one verification test for AC, AV, and VMA according to the corresponding procedures as given in Subsection 402.03.02. The Department will randomly determine when to obtain the verification sample using the Asphalt Mixture Sample Random Tonnage Generator. For specialty mixtures, the Department will perform one AC and one gradation determination per lot according to the corresponding procedures as given in Subsection 402.03.02. However, Department personnel will not perform AC determinations according to KM 64-405. The Contractor will obtain a quality control sample at the same time the Department obtains the mixture verification sample and perform testing according to the procedures given in Subsection 402.03.02. If the Contractor's quality control sample is verified by the Department's test results within the tolerances provided below, the Contractor's sample will serve as the quality control sample for the affected subplot. The Department may perform the mixture verification test on the Contractor's equipment or on the Department's equipment.
<b>Subsection:</b>	402.03.03 Verification.
<b>Part:</b>	A) Evaluation of Subplot(s) Verified by Department.
<b>Revision:</b>	Replace the third sentence of the second paragraph with the following: When the paired <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate.
<b>Subsection:</b>	402.03.03 Verification.
<b>Part:</b>	B) Evaluation of Subplots Not Verified by Department.
<b>Revision:</b>	Replace the third sentence of the first paragraph with the following: When differences between test results are not within the tolerances listed below, the Department will resolve the discrepancy according to Subsection 402.03.05.

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<b>Subsection:</b>	402.03.03 Verification.
<b>Part:</b>	B) Evaluation of Sublots Not Verified by Department.
<b>Revision:</b>	Replace the third sentence of the second paragraph with the following: When the <i>F</i> -test or <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate.
<b>Subsection:</b>	402.03.03 Verification.
<b>Part:</b>	C) Test Data Patterns.
<b>Revision:</b>	Replace the second sentence with the following: When patterns indicate substantial differences between the verified and non-verified sublots, the Department will perform further comparative testing according to subsection 402.03.05.
<b>Subsection:</b>	402.03 CONSTRUCTION.
<b>Revision:</b>	Add the following subsection: <b>402.03.04 Testing Equipment and Technician Verification.</b> For mixtures with a minimum quantity of 20,000 tons and for every 20,000 tons thereafter, the Department will obtain an additional verification sample at random using the Asphalt Mixture Sample Random Tonnage Generator in order to verify the integrity of the Contractor's and Department's laboratory testing equipment and technicians. The Department will obtain a mixture sample of at least 150 lb at the asphalt mixing plant according to KM 64-425 and split it according to AASHTO R 47. The Department will retain one split portion of the sample and provide the other portion to the Contractor. At a later time convenient to both parties, the Department and Contractor will simultaneously reheat the sample to the specified compaction temperature and test the mixture for AV and VMA using separate laboratory equipment according to the corresponding procedures given in Subsection 402.03.02. The Department will evaluate the differences in test results between the two laboratories. When the difference between the results for AV or VMA is not within $\pm 2.0$ percent, the Department will investigate and resolve the discrepancy according to Subsection 402.03.05.
<b>Subsection:</b>	402.03.04 Dispute Resolution.
<b>Revision:</b>	Change the subsection number to 402.03.05.
<b>Subsection:</b>	402.05 PAYMENT.
<b>Part:</b>	Lot Pay Adjustment Schedule Compaction Option A Base and Binder Mixtures
<b>Table:</b>	AC
<b>Revision:</b>	Replace the Deviation from JMF(%) that corresponds to a Pay Value of 0.95 to $\pm 0.6$ .
<b>Subsection:</b>	403.02.10 Material Transfer Vehicle (MTV).
<b>Revision:</b>	Replace the first sentence with the following: In addition to the equipment specified above, provide a MTV with the following minimum characteristics:
<b>Subsection:</b>	412.02.09 Material Transfer Vehicle (MTV).
<b>Revision:</b>	Replace the paragraph with the following: Provide and utilize a MTV with the minimum characteristics outlined in section 403.02.10.

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<b>Subsection:</b>	412.03.07 Placement and Compaction.
<b>Revision:</b>	Replace the first paragraph with the following: Use a MTV when placing SMA mixture in the driving lanes. The MTV is not required on ramps and/or shoulders unless specified in the contract. When the Engineer determines the use of the MTV is not practical for a portion of the project, the Engineer may waive its requirement for that portion of pavement by a letter documenting the waiver.
<b>Subsection:</b>	412.04 MEASUREMENT.
<b>Revision:</b>	Add the following subsection: 412.04.03. Material Transfer Vehicle (MTV). The Department will not measure the MTV for payment and will consider its use incidental to the asphalt mixture.
<b>Subsection:</b>	501.03.19 Surface Tolerances and Testing Surface.
<b>Part:</b>	B) Ride Quality.
<b>Revision:</b>	Add the following to the end of the first paragraph: The Department will specify if the ride quality requirements are Category A or Category B when ride quality is specified in the Contract. Category B ride quality requirements shall apply when the Department fails to classify which ride quality requirement will apply to the Contract.
<b>Subsection:</b>	603.03.06 Cofferdams.
<b>Revision:</b>	Replace the seventh sentence of paragraph one with the following: Submit drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.
<b>Subsection:</b>	605.03.04 Tack Welding.
<b>Revision:</b>	Insert the subsection and the following: 605.03.04 Tack Welding. The Department does not allow tack welding.
<b>Subsection:</b>	606.03.17 Special Requirements for Latex Concrete Overlays.
<b>Part:</b>	A) Existing Bridges and New Structures.
<b>Number:</b>	1) Prewetting and Grout-Bond Coat.
<b>Revision:</b>	Add the following sentence to the last paragraph: Do not apply a grout-bond coat on bridge decks prepared by hydrodemolition.
<b>Subsection:</b>	609.03 Construction.
<b>Revision:</b>	Replace Subsection 609.03.01 with the following: 609.03.01 A) Swinging the Spans. Before placing concrete slabs on steel spans or precast concrete release the temporary erection supports under the bridge and swing the span free on its supports. 609.03.01 B) Lift Loops. Cut all lift loops flush with the top of the precast beam once the beam is placed in the final location and prior to placing steel reinforcement. At locations where lift loops are cut, paint the top of the beam with galvanized or epoxy paint.
<b>Subsection:</b>	611.03.02 Precast Unit Construction.
<b>Revision:</b>	Replace the first sentence of the subsection with the following: Construct units according to ASTM C1577, <b>replacing Table 1 (Design Requirements for Precast Concrete Box Sections Under Earth, Dead and HL-93 Live Load Conditions) with KY Table 1 (Precast Culvert KYHL-93 Design Table)</b> , and Section 605 with the following exceptions and additions:

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<b>Subsection:</b>	613.03.01 Design.
<b>Number:</b>	2)
<b>Revision:</b>	Replace "AASHTO Standard Specifications for Highway Bridges" with "AASHTO LRFD Bridge Design Specifications"
<b>Subsection:</b>	615.06.02
<b>Revision:</b>	Add the following sentence to the end of the subsection. The ends of units shall be normal to walls and centerline except exposed edges shall be beveled ¾ inch.
<b>Subsection:</b>	615.06.03 Placement of Reinforcement in Precast 3-Sided Units.
<b>Revision:</b>	Replace the reference of 6.6 in the section to 615.06.06.
<b>Subsection:</b>	615.06.04 Placement of Reinforcement for Precast Endwalls.
<b>Revision:</b>	Replace the reference of 6.7 in the section to 615.06.07.
<b>Subsection:</b>	615.06.06 Laps, Welds, and Spacing for Precast 3-Sided Units.
<b>Revision:</b>	Replace the subsection with the following: Tension splices in the circumferential reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. The overlap of welded wire fabric shall be measured between the outer most longitudinal wires of each fabric sheet. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be no less than 2 inches and no more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches.
<b>Subsection:</b>	615.06.07 Laps, Welds, and Spacing for Precast Endwalls.
<b>Revision:</b>	Replace the subsection with the following: Splices in the reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. The spacing center-to-center of the wire fabric sheet shall not be less than 2 inches or more than 8 inches.

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<b>Subsection:</b>	615.08.01 Type of Test Specimen.
<b>Revision:</b>	Replace the subsection with the following: Start-up slump, air content, unit weight, and temperature tests will be performed each day on the first batch of concrete. Acceptable start-up results are required for production of the first unit. After the first unit has been established, random acceptance testing is performed daily for each 50 yd <sup>3</sup> (or fraction thereof). In addition to the slump, air content, unit weight, and temperature tests, a minimum of one set of cylinders shall be required each time plastic property testing is performed.
<b>Subsection:</b>	615.08.02 Compression Testing.
<b>Revision:</b>	Delete the second sentence.
<b>Subsection:</b>	615.08.04 Acceptability of Core Tests.
<b>Revision:</b>	Delete the entire subsection.
<b>Subsection:</b>	615.12 Inspection.
<b>Revision:</b>	Add the following sentences to the end of the subsection: Units will arrive at jobsite with the "Kentucky Oval" stamped on the unit which is an indication of acceptable inspection at the production facility. Units shall be inspected upon arrival for any evidence of damage resulting from transport to the jobsite.
<b>Subsection:</b>	716.02.02 Paint.
<b>Revision:</b>	Replace sentence with the following: Conform to Section 821.
<b>Subsection:</b>	716.03 CONSTRUCTION.
<b>Revision:</b>	Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims,
<b>Subsection:</b>	716.03.02 Lighting Standard Installation.
<b>Revision:</b>	Replace the second sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base.
<b>Subsection:</b>	716.03.02 Lighting Standard Installation.
<b>Part:</b>	A) Conventional Installation.
<b>Revision:</b>	Replace the third sentence with the following: Orient the transformer base so the door is positioned on the side away from on-coming traffic.
<b>Subsection:</b>	716.03.02 Lighting Standard Installation.
<b>Part:</b>	A) Conventional Installation.
<b>Number:</b>	1) Breakaway Installation and Requirements.
<b>Revision:</b>	Replace the first sentence with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.
<b>Subsection:</b>	716.03.02 Lighting Standard Installation.
<b>Part:</b>	B) High Mast Installation
<b>Revision:</b>	Replace the first sentence with the following: Install each high mast pole as noted on plans.
<b>Subsection:</b>	716.03.02 Lighting Standard Installation.
<b>Part:</b>	B) High Mast Installation
<b>Number:</b>	2) Concrete Base Installation
<b>Revision:</b>	Modification of Chart and succeeding paragraphs within this section:

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Drilled Shaft Depth Data							
Level Ground		3:1 Ground Slope		2:1 Ground Slope		1.5:1 Ground Slope <sup>(2)</sup>	
Soil	Rock	Soil	Rock	Soil	Rock	Soil	Rock
17 ft	7 ft	19 ft	7 ft	20 ft	7 ft	<sup>(1)</sup>	7 ft
Steel Requirements							
Vertical Bars		Ties or Spiral					
Size	Total	Size	Spacing or Pitch				
#10	16	#4	12 inch				

(1): Shaft length is 22' for cohesive soil only. For cohesionless soil, contact geotechnical branch for design.

(2): Do not construct high mast drilled shafts on ground slopes steeper than 1.5:1 without the approval of the Division of Traffic.

If rock is encountered during drilling operations and confirmed by the engineer to be of sound quality, the shaft is only required to be further advanced into the rock by the length of rock socket shown in the table. The total length of the shaft need not be longer than that of soil alone. Both longitudinal rebar length and number of ties or spiral length shall be adjusted accordingly.

If a shorter depth is desired for the drilled shaft, the contractor shall provide, for the state's review and approval, a detailed column design with individual site specific soil and rock analysis performed and approved by a Professional Engineer licensed in the Commonwealth of Kentucky.

Spiral reinforcement may be substituted for ties. If spiral reinforcement is used, one and one-half closed coils shall be provided at the ends of each spiral unit. Subsurface conditions consisting of very soft clay or very loose saturated sand could result in soil parameters weaker than those assumed. Engineer shall consult with the geotechnical branch if such conditions are encountered.

The bottom of the drilled hole shall be firm and thoroughly cleaned so no loose or compressible materials are present at the time of the concrete placement. If the drilled hole contains standing water, the concrete shall be placed using a tremie to displace water. Continuous concrete flow will be required to insure full displacement of any water.

The reinforcement and anchor bolts shall be adequately supported in the proper positions so no movement occurs during concrete placement. Welding of anchor bolts to the reinforcing cage is unacceptable, templates shall be used. Exposed portions of the foundation shall be formed to create a smooth finished surface. All forming shall be removed upon completion of foundation construction.

<b>Subsection:</b>	716.03.03 Trenching.
<b>Part:</b>	A) Trenching of Conduit for Highmast Ducted Cables.
<b>Revision:</b>	Add the following after the first sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.

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<b>Subsection:</b>	716.03.03 Trenching.
<b>Part:</b>	B) Trenching of Conduit for Non-Highmast Cables.
<b>Revision:</b>	Add the following after the second sentence: If depths greater than 24 inches are necessary for either situation listed previously, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.
<b>Subsection:</b>	716.03.10 Junction Boxes.
<b>Revision:</b>	Replace subsection title with the following: Electrical Junction Box.
<b>Subsection:</b>	716.04.07 Pole with Secondary Control Equipment.
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure mounting the cabinet to the pole, backfilling, restoration, any necessary hardware to anchor pole, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breaker, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work.
<b>Subsection:</b>	716.04.08 Lighting Control Equipment.
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure constructing the concrete base, excavation, backfilling, restoration, any necessary anchors, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breakers, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work.
<b>Subsection:</b>	716.04.09 Luminaire.
<b>Revision:</b>	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
<b>Subsection:</b>	716.04.10 Fused Connector Kits.
<b>Revision:</b>	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
<b>Subsection:</b>	716.04.13 Junction Box.
<b>Revision:</b>	Replace the subsection title with the following: Electrical Junction Box Type Various.
<b>Subsection:</b>	716.04.13 Junction Box.
<b>Part:</b>	A) Junction Electrical.
<b>Revision:</b>	Rename A) Junction Electrical to the following: A) Electrical Junction Box.
<b>Subsection:</b>	716.04.14 Trenching and Backfilling.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work.

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<b>Subsection:</b>	716.04.18 Remove Lighting.															
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity as a lump sum for the removal of lighting equipment. The Department will not measure the disposal of all equipment and materials off the project by the contractor. The Department also will not measure the transportation of the materials and will consider them incidental to this item of work.															
<b>Subsection:</b>	716.04.20 Bore and Jack Conduit.															
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4.															
<b>Subsection:</b>	716.05 PAYMENT.															
<b>Revision:</b>	Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following:															
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<b>Subsection:</b>	723.02.02 Paint.															
<b>Revision:</b>	Replace sentence with the following: Conform to Section 821.															
<b>Subsection:</b>	723.03 CONSTRUCTION.															
<b>Revision:</b>	Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims,															
<b>Subsection:</b>	723.03.02 Poles and Bases Installation.															
<b>Revision:</b>	Replace the first sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base.															
<b>Subsection:</b>	723.03.02 Poles and Bases Installation.															
<b>Part:</b>	A) Steel Strain and Mastarm Poles Installation															
<b>Revision:</b>	Replace the second paragraph with the following: For concrete base installation, see Section 716.03.02, B), 2), Paragraphs 2-7. Drilled shaft depth shall be based on the soil conditions encountered during drilling and slope condition at the site. Refer to the design chart below:															
<b>Subsection:</b>	723.03.02 Poles and Bases Installation.															
<b>Part:</b>	B) Pedestal or Pedestal Post Installation.															
<b>Revision:</b>	Replace the fourth sentence of the paragraph with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.															

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<b>Subsection:</b>	723.03.03 Trenching.
<b>Part:</b>	A) Under Roadway.
<b>Revision:</b>	Add the following after the second sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain either required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.
<b>Subsection:</b>	723.03.11 Wiring Installation.
<b>Revision:</b>	Add the following sentence between the fifth and sixth sentences: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes.
<b>Subsection:</b>	723.03.12 Loop Installation.
<b>Revision:</b>	Replace the fourth sentence of the 2nd paragraph with the following: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes.
<b>Subsection:</b>	723.04.02 Junction Box.
<b>Revision:</b>	Replace subsection title with the following: Electrical Junction Box Type Various.
<b>Subsection:</b>	723.04.03 Trenching and Backfilling.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work.
<b>Subsection:</b>	723.04.10 Signal Pedestal.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, specified conduits, fittings, ground rod, ground wire, backfilling, restoring disturbed areas, or other necessary hardware and will consider them incidental to this item of work.
<b>Subsection:</b>	723.04.15 Loop Saw Slot and Fill.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure sawing, cleaning and filling induction loop saw slot, loop sealant, backer rod, and grout and will consider them incidental to this item of work.
<b>Subsection:</b>	723.04.16 Pedestrian Detector.
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished, installed and connected to pole/pedestal. The Department will not measure installing R10-3e (with arrow) sign, furnishing and installing mounting hardware for sign and will consider them incidental to this item of work.
<b>Subsection:</b>	723.04.18 Signal Controller- Type 170.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure furnishing and connecting the induction of loop amplifiers, pedestrian isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work.

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<b>Subsection:</b>	723.04.20 Install Signal Controller - Type 170.
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed. The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, and excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure connecting the induction loop amplifiers, pedestrian, isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work.
<b>Subsection:</b>	723.04.22 Remove Signal Equipment.
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity as a lump sum removal of signal equipment. The Department will not measure the return of control equipment and signal heads to the Department of Highways as directed by the District Traffic Engineer. The Department also will not measure the transportation of materials of the disposal of all other equipment and materials off the project by the contractor and will consider them incidental to this item of work.
<b>Subsection:</b>	723.04.28 Install Pedestrian Detector Audible.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure installing sign R10-3e (with arrow) and will consider it incidental to this item of work.
<b>Subsection:</b>	723.04.29 Audible Pedestrian Detector.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure furnishing and installing the sign R10-3e (with arrow) and will consider it incidental to this item of work.
<b>Subsection:</b>	723.04.30 Bore and Jack Conduit.
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4.
<b>Subsection:</b>	723.04.31 Install Pedestrian Detector.
<b>Revision:</b>	Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed and connected to pole/pedestal. The Department will not measure installing sign R 10-3e (with arrow) and will consider it incidental to this item of work.
<b>Subsection:</b>	723.04.32 Install Mast Arm Pole.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure arms, signal mounting brackets, anchor bolts, or any other necessary hardware and will consider them incidental to this item of work.
<b>Subsection:</b>	723.04.33 Pedestal Post.
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, conduit, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.

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<b>Subsection:</b>	723.04.36 Traffic Signal Pole Base.															
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure excavation, reinforcing steel, anchor bolts, specified conduits, ground rods, ground wires, backfilling, or restoration and will consider them incidental to this item of work.															
<b>Subsection:</b>	723.04.37 Install Signal Pedestal.															
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.															
<b>Subsection:</b>	723.04.38 Install Pedestal Post.															
<b>Revision:</b>	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.															
<b>Subsection:</b>	723.05 PAYMENT.															
<b>Revision:</b>	Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following:															
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<b>Subsection:</b>	804.01.02 Crushed Sand.															
<b>Revision:</b>	Delete last sentence of the section.															
<b>Subsection:</b>	804.01.06 Slag.															
<b>Revision:</b>	Add subsection and following sentence. Provide blast furnace slag sand where permitted. The Department will allow steel slag sand only in asphalt surface applications.															
<b>Subsection:</b>	804.04 Asphalt Mixtures.															
<b>Revision:</b>	Replace the subsection with the following: Provide natural, crushed, conglomerate, or blast furnace slag sand, with the addition of filler as necessary, to meet gradation requirements. The Department will allow any combination of natural, crushed, conglomerate or blast furnace slag sand when the combination is achieved using cold feeds at the plant. The Engineer may allow other fine aggregates.															
<b>Subsection:</b>	806.03.01 General Requirements.															
<b>Revision:</b>	Replace the second sentence of the paragraph with the following: Additionally, the material must have a minimum solubility of 99.0 percent when tested according to AASHTO T 44 and PG 76-22 must exhibit a minimum recovery of 60 percent, with a J <sub>NR</sub> (nonrecoverable creep compliance) between 0.1 and 0.5, when tested according to AASHTO TP 70.															

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<b>Subsection:</b>	806.03.01 General Requirements.														
<b>Table:</b>	PG Binder Requirements and Price Adjustment Schedule														
<b>Revision:</b>	Replace the Elastic Recovery, % <sup>(3)</sup> (AASHTO T301) and all corresponding values in the table with the following:														
	<table border="1"> <thead> <tr> <th><u>Test</u></th> <th><u>Specification</u></th> <th><u>100% Pay</u></th> <th><u>90% Pay</u></th> <th><u>80% Pay</u></th> <th><u>70% Pay</u></th> <th><u>50% Pay<sup>(1)</sup></u></th> </tr> </thead> <tbody> <tr> <td>MSCR recovery, % <sup>(3)</sup> (AASHTO TP 70)</td> <td>60 Min.</td> <td>≥58</td> <td>56</td> <td>55</td> <td>54</td> <td>&lt;53</td> </tr> </tbody> </table>	<u>Test</u>	<u>Specification</u>	<u>100% Pay</u>	<u>90% Pay</u>	<u>80% Pay</u>	<u>70% Pay</u>	<u>50% Pay<sup>(1)</sup></u>	MSCR recovery, % <sup>(3)</sup> (AASHTO TP 70)	60 Min.	≥58	56	55	54	<53
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MSCR recovery, % <sup>(3)</sup> (AASHTO TP 70)	60 Min.	≥58	56	55	54	<53									
<b>Subsection:</b>	806.03.01 General Requirements.														
<b>Table:</b>	PG Binder Requirements and Price Adjustment Schedule														
<b>Superscript:</b>	(3)														
<b>Revision:</b>	Replace <sup>(3)</sup> with the following: Perform testing at 64°C.														
<b>Subsection:</b>	813.04 Gray Iron Castings.														
<b>Revision:</b>	Replace the reference to "AASHTO M105" with "ASTM A48".														
<b>Subsection:</b>	813.09.02 High Strength Steel Bolts, Nuts, and Washers.														
<b>Number:</b>	A) Bolts.														
<b>Revision:</b>	Delete first paragraph and "Hardness Number" Table. Replace with the following: A) Bolts. Conform to ASTM A325 (AASHTO M164) or ASTM A490 (AASHTO 253) as applicable.														
<b>Subsection:</b>	814.04.02 Timber Guardrail Posts.														
<b>Revision:</b>	Third paragraph, replace the reference to "AWPA C14" with "AWPA U1, Section B, Paragraph 4.1".														
<b>Subsection:</b>	814.04.02 Timber Guardrail Posts.														
<b>Revision:</b>	Replace the first sentence of the fourth paragraph with the following: Use any of the species of wood for round or square posts covered under AWPA U1.														
<b>Subsection:</b>	814.04.02 Timber Guardrail Posts.														
<b>Revision:</b>	Fourth paragraph, replace the reference to "AWPA C2" with "AWPA U1, Section B, Paragraph 4.1".														
<b>Subsection:</b>	814.04.02 Timber Guardrail Posts.														
<b>Revision:</b>	Delete the second sentence of the fourth paragraph.														
<b>Subsection:</b>	814.05.02 Composite Plastic.														
<b>Revision:</b>	1) Add the following to the beginning of the first paragraph: Select composite offset blocks conforming to this section and assure blocks are from a manufacturer included on the Department's List of Approved Materials. 2) Delete the last paragraph of the subsection.														
<b>Subsection:</b>	816.07.02 Wood Posts and Braces.														
<b>Revision:</b>	First paragraph, replace the reference to "AWPA C5" with "AWPA U1, Section B, Paragraph 4.1".														
<b>Subsection:</b>	816.07.02 Wood Posts and Braces.														
<b>Revision:</b>	Delete the second sentence of the first paragraph.														
<b>Subsection:</b>	818.07 Preservative Treatment.														
<b>Revision:</b>	First paragraph, replace all references to "AWPA C14" with "AWPA U1, Section A".														

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<b>Subsection:</b>	834.14 Lighting Poles.
<b>Revision:</b>	Replace the first sentence with the following: Lighting pole design shall be in accordance with loading and allowable stress requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims, with the exception of the following: The Cabinet will waive the requirement stated in the first sentence of Section 5.14.6.2 – Reinforced Holes and Cutouts for high mast poles (only). The minimum diameter at the base of the pole shall be 22 inches for high mast poles (only).
<b>Subsection</b>	834.14.03 High Mast Poles.
<b>Revision:</b>	Remove the second and fourth sentence from the first paragraph.
<b>Subsection</b>	834.14.03 High Mast Poles.
<b>Revision:</b>	Replace the third paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.
<b>Subsection:</b>	834.14.03 High Mast Poles.
<b>Revision:</b>	<p>Replace paragraph six with the following: Provide a pole section that conforms to ASTM A 595 grade A with a minimum yield strength of 55 KSI or ASTM A 572 with a minimum yield strength of 55 KSI. Use tubes that are round or 16 sided with a four inch corner radius, have a constant linear taper of .144 in/ft and contain only one longitudinal seam weld. Circumferential welded tube butt splices and laminated tubes are not permitted. Provide pole sections that are telescopically slip fit assembled in the field to facilitate inspection of interior surface welds and the protective coating. The minimum length of the telescopic slip splices shall be 1.5 times the inside diameter of the exposed end of the female section. Use longitudinal seam welds as commended in Section 5.15 of the AASHTO 2013 Specifications. The thickness of the transverse base shall not be less than 2 inches. Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration groove weld with backup bar.</p> <p>The handhole cover shall be removable from the handhole frame. One the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department’s standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM A 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7-guage stainless steel to provide adjustability to insure weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube of the pole but needs to be at least 15 inches. Provide products that are hot-dip galvanized to the requirements of either ASTM A123 (fabricated products) or ASTM A 153 (hardware items).</p>
<b>Subsection:</b>	834.16 ANCHOR BOLTS.
<b>Revision:</b>	Insert the following sentence at the beginning of the paragraph: The anchor bolt design shall follow the NCHRP Report 494 Section 2.4 and NCHRP 469 Appendix A Specifications.

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<b>Subsection:</b>	834.17.01 Conventional.
<b>Revision:</b>	Add the following sentence after the second sentence: Provide a waterproof sticker mounted on the bottom of the housing that is legible from the ground and indicates the wattage of the fixture by providing the first two numbers of the wattage.
<b>Subsection:</b>	834.21.01 Waterproof Enclosures.
<b>Revision:</b>	Replace the last five sentences in the second paragraph with the following sentences: Provide a cabinet door with a louvered air vent, filter-retaining brackets and an easy to clean metal filter. Provide a cabinet door that is keyed with a factory installed standard no. 2 corbin traffic control key. Provide a light fixture with switch and bulb. Use a 120-volt fixture and utilize a L.E.D. bulb (equivalent to 60 watts minimum). Fixture shall be situated at or near the top of the cabinet and illuminate the contents of the cabinet. Provide a 120 VAC GFI duplex receptacle in the enclosure with a separate 20 amp breaker.
<b>Subsection:</b>	835.07 Traffic Poles.
<b>Revision:</b>	Replace the first sentence of the first paragraph with the following: Pole diameter and wall thickness shall be calculated in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.
<b>Subsection:</b>	835.07 Traffic Poles.
<b>Revision:</b>	*Replace the first sentence of the fourth paragraph with the following: Ensure transverse plates have a thickness $\geq 2$ inches. *Add the following sentence to the end of the fourth paragraph: The bottom pole diameter shall not be less than 16.25 inches.
<b>Subsection:</b>	835.07 Traffic Poles.
<b>Revision:</b>	Replace the third sentence of the fifth paragraph with the following: For anchor bolt design, pole forces shall be positioned in such a manner to maximize the force on any individual anchor bolt regardless of the actual anchor bolt orientation with the pole.
<b>Subsection:</b>	835.07 Traffic Poles.
<b>Revision:</b>	Replace the first and second sentence of the sixth paragraph with the following: The pole handhole shall be 25 inches by 6.5 inches. The handhole cover shall be removable from the handhole frame. On the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7 gauge stainless steel to provide adjustability to insure a weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube but needs to be at least 12 inches.

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<b>Subsection:</b>	835.07 Traffic Poles.									
<b>Revision:</b>	*Replace the first sentence of the last paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky. *Replace the third sentence of the last paragraph with the following: All tables referenced in 835.07 are found in the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.									
<b>Subsection:</b>	835.07.01 Steel Strain Poles.									
<b>Revision:</b>	Replace the second sentence of the second paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.									
<b>Subsection:</b>	835.07.01 Steel Strain Poles.									
<b>Revision:</b>	Replace number 7. after the second paragraph with the following: 7. Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1.									
<b>Subsection:</b>	835.07.02 Mast Arm Poles.									
<b>Revision:</b>	Replace the second sentence of the fourth paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.									
<b>Subsection:</b>	835.07.02 Mast Arm Poles.									
<b>Revision:</b>	Replace number 7) after the fourth paragraph with the following: 7) Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1.									
<b>Subsection:</b>	835.07.03 Anchor Bolts.									
<b>Revision:</b>	Add the following to the end of the paragraph: There shall be two steel templates (one can be used for the headed part of the anchor bolt when designed in this manner) provided per pole. Templates shall be contained within a 26.5 inch diameter. All templates shall be fully galvanized (ASTM A 153).									
<b>Subsection:</b>	835.16.05 Optical Units.									
<b>Revision:</b>	Replace the 3rd paragraph with the following: The list of certified products can be found on the following website: <a href="http://www.intertek.com">http://www.intertek.com</a> .									
<b>Subsection:</b>	835.19.01 Pedestrian Detector Body.									
<b>Revision:</b>	Replace the first sentence with the following: Provide a four holed pole mounted aluminum rectangular housing that is compatible with the pedestrian detector.									
<b>Subsection:</b>	843.01.01 Geotextile Fabric.									
<b>Table:</b>	TYPE I FABRIC GEOTEXTILES FOR SLOPE PROTECTION AND CHANNEL LINING									
<b>Revision:</b>	Add the following to the chart:									
	<table border="1"> <thead> <tr> <th><u>Property</u></th> <th><u>Minimum Value<sup>(1)</sup></u></th> <th><u>Test Method</u></th> </tr> </thead> <tbody> <tr> <td>CBR Puncture (lbs)</td> <td>494</td> <td>ASTM D6241</td> </tr> <tr> <td>Permittivity (1/s)</td> <td>0.7</td> <td>ASTM D4491</td> </tr> </tbody> </table>	<u>Property</u>	<u>Minimum Value<sup>(1)</sup></u>	<u>Test Method</u>	CBR Puncture (lbs)	494	ASTM D6241	Permittivity (1/s)	0.7	ASTM D4491
<u>Property</u>	<u>Minimum Value<sup>(1)</sup></u>	<u>Test Method</u>								
CBR Puncture (lbs)	494	ASTM D6241								
Permittivity (1/s)	0.7	ASTM D4491								

**Supplemental Specifications to the  
Standard Specifications for Road and Bridge Construction, 2012 Edition  
Effective with the August 22, 2014 Letting**

<b>Subsection:</b>	843.01.01 Geotextile Fabric.		
<b>Table:</b>	TYPE II FABRIC GEOTEXTILES FOR UNDERDRAINS		
<b>Revision:</b>	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value<sup>(1)</sup></u>	<u>Test Method</u>
	CBR Puncture (lbs)	210	ASTM D6241
	Permittivity (1/s)	0.5	ASTM D4491
<b>Subsection:</b>	843.01.01 Geotextile Fabric.		
<b>Table:</b>	TYPE III FABRIC GEOTEXTILES FOR SUBGRADE OR EMBANKMENT STABILIZATION		
<b>Revision:</b>	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value<sup>(1)</sup></u>	<u>Test Method</u>
	CBR Puncture (lbs)	370	ASTM D6241
	Permittivity (1/s)	0.05	ASTM D4491
<b>Subsection:</b>	843.01.01 Geotextile Fabric.		
<b>Table:</b>	TYPE IV FABRIC GEOTEXTILES FOR EMBANKMENT DRAINAGE BLANKETS AND PAVEMENT EDGE DRAINS		
<b>Revision:</b>	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value<sup>(1)</sup></u>	<u>Test Method</u>
	CBR Puncture (lbs)	309	ASTM D6241
	Permittivity (1/s)	0.5	ASTM D4491
<b>Subsection:</b>	843.01.01 Geotextile Fabric.		
<b>Table:</b>	TYPE V HIGH STRENGTH GEOTEXTILE FABRIC		
<b>Revision:</b>	Make the following changes to the chart:		
	<u>Property</u>	<u>Minimum Value<sup>(1)</sup></u>	<u>Test Method</u>
	CBR Puncture (lbs)	618	ASTM D6241
	Grab Strength (lbs)	700	ASTM D4632
	Apparent Opening Size	U.S. #40 <sup>(3)</sup>	ASTM D4751
	<sup>(3)</sup> Maximum average roll value.		

## **SPECIAL NOTE FOR TURF REINFORCING MAT**

**1.0 DESCRIPTION.** Install turf reinforcement mat at locations specified in the Contract or as the Engineer directs. Section references herein are to the Department's 2008 Standard Specifications for Road and Bridge Construction.

### **2.0 MATERIALS.**

**2.1 Turf Reinforcement Mat (TRM).** Use a Turf Reinforcement Mat defined as permanent rolled erosion control product composed of non-degradable synthetic fibers, filaments, nets, wire mesh and/or other elements, processed into a three-dimensional matrix of sufficient thickness and from the Department's List of Approved Materials. Mats must be 100% UV stabilized materials. For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting exclusively. Ensure product labels clearly show the manufacturer or supplier name, style name, and roll number. Ensure labeling, shipment and storage follows ASTM D-4873. The Department will require manufacturer to provide TRMs that are machine constructed web of mechanically or melt bonded nondegradable fibers entangled to form a three dimensional matrix. The Department will require all long term performance property values in table below to be based on non degradable portion of the matting alone. Approved methods include polymer welding, thermal or polymer fusion, or placement of fibers between two high strength biaxially oriented nets mechanically bound by parallel stitching with polyolefin thread. Ensure that mats designated in the plans as Type 4 mats, are not to be manufactured from discontinuous or loosely held together by stitching or glued netting or composites. Type 4 mats shall be composed of geosynthetic matrix that exhibits a very high interlock and reinforcement capacities with both soil and root systems and with high tensile modulus. The Department will require manufacturer to use materials chemically and biologically inert to the natural soil environments conditions. Ensure the blanket is smolder resistant without the use of chemical additives. When stored, maintain the protective wrapping and elevate the mats off the ground to protect them from damage. The Department will not specify these materials for use in heavily acidic coal seam areas or other areas with soil problems that would severally limit vegetation growth.

- A) Dimensions. Ensure TRMs are furnished in strips with a minimum width of 4 feet and length of 50 feet.
- B) Weight. Ensure that all mat types have a minimum mass per unit area of 7 ounces per square yard according to ASTM D 6566.
- C) Performance Testing: The Department will require AASHTO's NTPEP index testing. The Department will also require the manufacturer to perform internal MARV testing at a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory for tensile strength, tensile elongation, mass per unit area, and thickness once every 24,000 yds of production or whatever rate is required to ensure 97.7% confidence under ASTM D4439& 4354. The Department will require Full scale testing for slope and channel applications shear stress shall be done under ASTM D 6459, ASTM D 6460-07 procedures.

### **2.2 Classifications**

The basis for selection of the type of mat required will be based on the long term shear stress level of the mat of the channel in question or the degree of slope to protect and will be designated in the contract. The Type 4 mats are to be used at structural backfills protecting critical

structures, utility cuts, areas where vehicles may be expected to traverse the mat, channels with large heavy drift, and where higher factors of safety, very steep slopes and/or durability concerns are needed as determined by project team and designer and will be specified in the plans by designer.

Turf Reinforcement Matting					
Properties <sup>1</sup>	Type 1	Type 2	Type 3	Type 4	Test Method
Minimum tensile Strength lbs/ft	125	150	175	3000 by 1500	ASTM D6818 <sup>2</sup>
UV stability (minimum % tensile retention)	80	80	80	90	ASTM D4355 <sup>3</sup> (1000-hr exposure)
Minimum thickness (inches)	0.25	0.25	0.25	0.40	ASTM D6525
Slopes applications	2H:1V or flatter	1.5H:1V or flatter	1H:1V or flatter	1 H: 1V or greater	
Shear stress lbs/ft <sup>2</sup> Channel applications	6.0 <sup>4</sup>	8.0 <sup>4</sup>	10.0 <sup>4</sup>	12.0 <sup>4</sup>	ASTM D6459 ASTM D6460-07

<sup>1</sup> For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting alone.

<sup>2</sup>Minimum Average Roll Values for tensile strength of sample material machine direction.

<sup>3</sup>Tensile Strength percentage retained after stated 1000 hr duration of exposure under ASTM D4355 testing. Based on nondegradable components exclusively.

<sup>4</sup>Maximum permissible shear design values based on short-term (0.5 hr) vegetated data obtained by full scale flume testing ASTM D6459, D6460-07. Based on nondegradable components exclusively. Testing will be done at Independent Hydraulics Facility such as Colorado State University hydraulics laboratory, Utah State University hydraulics laboratory, Texas Transportation Institute (TTI) hydraulics and erosion control laboratory.

### 2.3 Quality Assurance Sampling, Testing, and Acceptance

- A) Provide TRM listed on the Department’s List of Approved Materials. Prior to inclusion on the LAM, the manufacturer of TRM must meet the physical and performance criteria as outlined in the specification and submit a Letter Certifying compliance of the product under the above ASTM testing procedures and including a copy of report from Full Scale Independent Hydraulics Facility that Fully Vegetated Shear Stress meets shear stress requirements tested under D6459 and D6460-07.
- B) Contractors will provide a Letter of Certification from Manufacturer stating the product name, manufacturer, and that the product MARV product unit testing results meets Department criteria. Provide Letters once per project and for each product.
- C) Acceptance shall be in accordance with ASTM D-4759 based on testing performed by a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory using Procedure A of ASTM D-4354.

Current mats meeting the above criteria are shown on the Department's List of Approved Materials.

**2.4 Fasteners.** When the mat manufacturer does not specify a specific fastener, use steel wire U-shaped staples with a minimum diameter of 0.09 inches (11 gauge), a minimum width of one inch and a minimum length of 12 inches. Use a heavier gauge when working in rocky or clay soils and longer lengths in sandy soils as directed by Engineer or Manufacturer's Representative. Provide staples with colored tops when requested by the Engineer.

**3.0 CONSTRUCTION.** When requested by the Engineer, provide a Manufacturer's Representative on-site to oversee and approve the initial installation of the mat. When requested by the Engineer, provide a letter from the Manufacturer approving the installation. When there is a conflict between the Department's criteria and the Manufacturer's criteria, construct using the more restrictive. The Engineer and Manufacturer's Representative must approve all alternate installation methods prior to execution. Construct according to the Manufacturer's recommendations and the following as minimum installation technique:

**3.1 Site Preparation.** Grade areas to be treated with matting and compact. Remove large rocks, soil clods, vegetation, roots, and other sharp objects that could keep the mat from intimate contact with subgrade. Prepare seedbed by loosening the top 2 to 3 inch of soil.

**3.2 Installation.** Install mats according to Standard Drawing Sepias "Turf Mat Channel Installation" and "Turf Mat Slope Installation." Install mats at the specified elevation and alignment. Anchor the mats with staples with a minimum length of 12 inches. Use longer anchors for installations in sandy, loose, or wet soils as directed by the Engineer or Manufacturer's Representative. The mat should be in direct contact with the soil surface.

**4.0 MEASUREMENT.** The Department will measure the quantity of Turf Reinforcement Mat by the square yard of surface covered. The Department will not measure preparation of the bed, providing a Manufacturer's Representative, topsoil, or seeding for payment and will consider them incidental to the Turf Reinforcement Mat. The Department will not measure any reworking of slopes or channels for payment as it is considered corrective work and incidental to the Turf Reinforcement Mat. Seeding and protection will be an incidental item.

**5.0 PAYMENT.** The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
23274EN11F	Turf Reinforcement Mat 1	Square Yard
23275EN11F	Turf Reinforcement Mat 2	Square Yard
23276EN11F	Turf Reinforcement Mat 3	Square Yard
23277EN11F	Turf Reinforcement Mat 4	Square Yard

April 18, 2009

## **PART III**

# **EMPLOYMENT, WAGE AND RECORD REQUIREMENTS**

## TRANSPORTATION CABINET DEPARTMENT OF HIGHWAYS

### LABOR AND WAGE REQUIREMENTS APPLICABLE TO OTHER THAN FEDERAL-AID SYSTEM PROJECTS

- I. Application
- II. Nondiscrimination of Employees (KRS 344)
- III. Payment of Predetermined Minimum Wages
- IV. Statements and Payrolls

#### I. APPLICATION

1. These contract provisions shall apply to all work performed on the contract by the contractor with his own organization and with the assistance of workmen under his immediate superintendence and to all work performed on the contract by piecework, station work or by subcontract. The contractor's organization shall be construed to include only workmen employed and paid directly by the contractor and equipment owned or rented by him, with or without operators.

2. The contractor shall insert in each of his subcontracts all of the stipulations contained in these Required Provisions and such other stipulations as may be required.

3. A breach of any of the stipulations contained in these Required Provisions may be grounds for termination of the contract.

#### II. NONDISCRIMINATION OF EMPLOYEES

##### AN ACT OF THE KENTUCKY GENERAL ASSEMBLY TO PREVENT DISCRIMINATION IN EMPLOYMENT KRS CHAPTER 344 EFFECTIVE JUNE 16, 1972

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy). The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, disability or age (between forty and seventy), except that such notice or advertisement may indicate a preference, limitation, or specification based on religion, or national origin when religion, or national origin is a bona fide occupational qualification for employment.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual

because of his race, color, religion, national origin, sex, disability or age (between forty and seventy), in admission to, or employment in any program established to provide apprenticeship or other training.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

#### III. PAYMENT OF PREDETERMINED MINIMUM WAGES

1. These special provisions are supplemented elsewhere in the contract by special provisions which set forth certain predetermined minimum wage rates. The contractor shall pay not less than those rates.

2. The minimum wage determination schedule shall be posted by the contractor, in a manner prescribed by the Department of Highways, at the site of the work in prominent places where it can be easily seen by the workers.

#### IV. STATEMENTS AND PAYROLLS

1. All contractors and subcontractors affected by the terms of KRS 337.505 to 337.550 shall keep full and accurate payroll records covering all disbursements of wages to their employees to whom they are required to pay not less than the prevailing rate of wages. Payrolls and basic records relating thereto will be maintained during the course of the work and preserved for a period of one (1) year from the date of completion of this contract.

2. The payroll records shall contain the name, address and social security number of each employee, his correct classification, rate of pay, daily and weekly number of hours worked, itemized deductions made and actual wages paid.

3. The contractor shall make his daily records available at the project site for inspection by the State Department of Highways contracting office or his authorized representative.

Periodic investigations shall be conducted as required to assure compliance with the labor provisions of the contract. Interrogation of employees and officials of the contractor shall be permitted during working hours.

Aggrieved workers, Highway Managers, Assistant District Engineers, Resident Engineers and Project Engineers shall report all complaints and violations to the Division of Contract Procurement.

The contractor shall be notified in writing of apparent violations. The contractor may correct the reported violations and notify the Department of Highways of the action taken or may request an informal hearing. The request for hearing shall be in writing within ten (10) days after receipt of the notice of the reported violation. The contractor may submit

records and information which will aid in determining the true facts relating to the reported violations.

Any person or organization aggrieved by the action taken or the findings established as a result of an informal hearing by the Division of Contract Procurement may request a formal hearing.

4. The wages of labor shall be paid in legal tender of the United States, except that this condition will be considered satisfied if payment is made by a negotiable check, on a solvent bank, which may be cashed readily by the employee in the local community for the full amount, without discount or collection charges of any kind. Where checks are used for payments, the contractor shall make all necessary arrangements for them to be cashed and shall give information regarding such arrangements.

5. No fee of any kind shall be asked or accepted by the contractor or any of his agents from any person as a condition of employment on the project.

6. No laborers shall be charged for any tools used in performing their respective duties except for reasonably avoidable loss or damage thereto.

7. Every employee on the work covered by this contract shall be permitted to lodge, board, and trade where and with whom he elects and neither the contractor nor his agents, nor his employees shall directly or indirectly require as a condition of employment that an employee shall lodge, board or trade at a particular place or with a particular person.

8. Every employee on the project covered by this contract shall be an employee of either the prime contractor or an approved subcontractor.

9. No charge shall be made for any transportation furnished by the contractor or his agents to any person employed on the work.

10. No individual shall be employed as a laborer or mechanic on this contract except on a wage basis, but this shall not be construed to prohibit the rental of teams, trucks or other equipment from individuals.

No Covered employee may be employed on the work except in accordance with the classification set forth in the schedule mentioned above; provided, however, that in the event additional classifications are required, application shall be made by the contractor to the Department of Highways and (1) the Department shall request appropriate classifications and rates from the proper agency, or (2) if there is urgent need for additional classification to avoid undue delay in the work, the contractor may employ such workmen at rates deemed comparable to rates established for similar classifications provided he has made written application through the Department of Highways, addressed to the proper agency, for the supplemental rates. The contractor shall retroactively adjust, upon receipt of the supplemental rates schedule, the wages of any employee paid less than the established rate and may adjust the wages of any employee overpaid.

11. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic in any work-week in which he is employed on such work, to work in excess of eight hours in any calendar day or in excess of forty hours in such work-week unless such laborer or mechanic receives compensation at a rate not less than one and one half times his basic rate of pay for all hours worked in excess of eight hours in any calendar day or in excess of forty hours in such work-week. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. This agreement shall be in writing and shall be executed prior to the employee working in excess of eight (8) hours, but not more than ten (10) hours, in any one (1) calendar day.

12. Payments to the contractor may be suspended or withheld due to failure of the contractor to pay any laborer or

mechanic employed or working on the site of the work, all or part of the wages required under the terms of the contract. The Department may suspend or withhold payments only after the contractor has been given written notice of the alleged violation and the contractor has failed to comply with the wage determination of the Department of Highways.

13. Contractors and subcontractors shall comply with the sections of Kentucky Revised Statutes, Chapter 337 relating to contracts for Public Works.

Revised 2-16-95

## EXECUTIVE BRANCH CODE OF ETHICS

In the 1992 regular legislative session, the General Assembly passed and Governor Brereton Jones signed Senate Bill 63 (codified as KRS 11A), the Executive Branch Code of Ethics, which states, in part:

KRS 11A.040 (6) provides:

No present or former public servant shall, within six (6) months of following termination of his office or employment, accept employment, compensation or other economic benefit from any person or business that contracts or does business with the state in matters in which he was directly involved during his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved in state government. This subsection shall not prohibit the performance of ministerial functions, including, but not limited to, filing tax returns, filing applications for permits or licenses, or filing incorporation papers.

KRS 11A.040 (8) states:

A former public servant shall not represent a person in a matter before a state agency in which the former public servant was directly involved, for a period of one (1) year after the latter of:

- a) The date of leaving office or termination of employment; or
- b) The date the term of office expires to which the public servant was elected.

This law is intended to promote public confidence in the integrity of state government and to declare as public policy the idea that state employees should view their work as a public trust and not as a way to obtain private benefits.

If you have worked for the executive branch of state government within the past six months, you may be subject to the law's prohibitions. The law's applicability may be different if you hold elected office or are contemplating representation of another before a state agency.

Also, if you are affiliated with a firm which does business with the state and which employs former state executive-branch employees, you should be aware that the law may apply to them.

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, Room 136, Capitol Building, 700 Capitol Avenue, Frankfort, Kentucky 40601; telephone (502) 564-7954.

### **Kentucky Equal Employment Opportunity Act of 1978**

The requirements of the Kentucky Equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) shall apply to this Contract. The apparent low Bidder will be required to submit EEO forms to the Division of Construction Procurement, which will then forward to the Finance and Administration Cabinet for review and approval. No award will become effective until all forms are submitted and EEO/CC has certified compliance. The required EEO forms are as follows:

- EEO-1: Employer Information Report
- Affidavit of Intent to Comply
- Employee Data Sheet
- Subcontractor Report

These forms are available on the Finance and Administration's web page under ***Vendor Information, Standard Attachments and General Terms*** at the following address:  
**<https://www.eProcurement.ky.gov>**.

Bidders currently certified as being in compliance by the Finance and Administration Cabinet may submit a copy of their approval letter in lieu of the referenced EEO forms.

For questions or assistance please contact the Finance and Administration Cabinet by email at **[finance.contractcompliance@ky.gov](mailto:finance.contractcompliance@ky.gov)** or by phone at 502-564-2874.

General Decision Number: KY140102 11/07/2014 KY102

Superseded General Decision Number: KY20130102

State: Kentucky

Construction Type: Highway

Counties: Allen, Ballard, Butler, Caldwell, Calloway, Carlisle, Christian, Crittenden, Daviess, Edmonson, Fulton, Graves, Hancock, Henderson, Hickman, Hopkins, Livingston, Logan, Lyon, Marshall, McCracken, McLean, Muhlenberg, Ohio, Simpson, Todd, Trigg, Union, Warren and Webster Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Modification Number	Publication Date
0	01/03/2014
1	04/04/2014
2	04/18/2014
3	05/16/2014
4	05/23/2014
5	06/06/2014
6	07/04/2014
7	07/18/2014
8	08/01/2014
9	10/24/2014
10	11/07/2014

BRIN0004-002 06/01/2014

BALLARD, BUTLER, CALDWELL, CARLISLE, CRITTENDEN, DAVIESS, EDMONSON, FULTON, GRAVES, HANCOCK, HENDERSON, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCRACKEN, MCLEAN, MUHLENBERG, OHIO, UNION, and WEBSTER COUNTIES

Rates Fringes

BRICKLAYER

Ballard, Caldwell, Carlisle, Crittenden, Fulton, Graves, Hickman, Livingston, Lyon, Marshall, and McCracken Counties.....	\$ 29.52	13.37
Butler, Edmonson, Hopkins, Muhlenberg, and Ohio Counties.....	\$ 24.61	10.22
Daviess, Hancock, Henderson, McLean, Union, and Webster Counties.....	\$ 28.68	13.72

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 BRTN0004-005 06/01/2014

ALLEN, CALLOWAY, CHRISTIAN, LOGAN, SIMPSON, TODD, TRIGG, and

WARREN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 25.37	10.50

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CARP0357-002 04/01/2014

	Rates	Fringes
CARPENTER.....	\$ 27.50	14.92
Diver.....	\$ 41.63	14.92
PILEDRIVERMAN.....	\$ 27.75	14.92

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ELEC0369-006 05/29/2013

BUTLER, EDMONSON, LOGAN, TODD & WARREN COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 29.48	14.37

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\* ELEC0429-001 06/01/2014

ALLEN & SIMPSON COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 24.44	10.15 + 5%

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ELEC0816-002 06/01/2014

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN,  
FULTON (Except a 5 mile radius of City Hall in Fulton), GRAVES,  
HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 30.82	25.5%+5.85

Cable spicers receive \$.25 per hour additional.

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ELEC1701-003 06/01/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO,  
UNION & WEBSTER COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 30.03	13.72

Cable spicers receive \$.25 per hour additional.

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ELEC1925-002 06/01/2014

FULTON COUNTY (Up to a 5 mile radius of City Hall in Fulton):

	Rates	Fringes
CABLE SPLICER.....	\$ 25.00	10.27

ELECTRICIAN.....\$ 24.80 11.01

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 ENGI0181-017 07/01/2014

Rates Fringes

POWER EQUIPMENT OPERATOR

GROUP 1.....	\$ 28.85	14.15
GROUP 2.....	\$ 26.24	14.15
GROUP 3.....	\$ 26.65	14.15
GROUP 4.....	\$ 25.95	14.15

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - A-Frame Winch Truck; Auto Patrol; Backfiller; Batcher Plant; Bituminous Paver; Bituminous Transfer Machine; Boom Cat; Bulldozer; Mechanic; Cableway; Carry-All Scoop; Carry Deck Crane; Central Compressor Plant; Cherry Picker; Clamshell; Concrete Mixer (21 cu. ft. or Over); Concrete Paver; Truck-Mounted Concrete Pump; Core Drill; Crane; Crusher Plant; Derrick; Derrick Boat; Ditching & Trenching Machine; Dragline; Dredge Operator; Dredge Engineer; Elevating Grader & Loaders; Grade-All; Gurries; Heavy Equipment Robotics Operator/Mechanic; High Lift; Hoe-Type Machine; Hoist (Two or More Drums); Hoisting Engine (Two or More Drums); Horizontal Directional Drill Operator; Hydrocrane; Hyster; KeCal Loader; LeTourneau; Locomotive; Mechanic; Mechanically Operated Laser Screed; Mechanic Welder; Mucking Machine; Motor Scraper; Orangepeel Bucket; Overhead Crane; Piledriver; Power Blade; Pumpcrete; Push Dozer; Rock Spreader, attached to equipment; Rotary Drill; Roller (Bituminous); Rough Terrain Crane; Scarifier; Scoopmobile; Shovel; Side Boom; Subgrader; Tailboom; Telescoping Type Forklift; Tow or Push Boat; Tower Crane (French, German & other types); Tractor Shovel; Truck Crane; Tunnel Mining Machines, including Moles, Shields or similar types of Tunnel Mining Equipment

GROUP 2 - Air Compressor (Over 900 cu. ft. per min.); Bituminous Mixer; Boom Type Tamping Machine; Bull Float; Concrete Mixer (Under 21 cu. ft.); Dredge Engineer; Electric Vibrator; Compactor/Self-Propelled Compactor; Elevator (One Drum or Buck Hoist); Elevator (When used to Hoist Building Material); Finish Machine; Firemen & Hoist (One Drum); Flexplane; Forklift (Regardless of Lift Height); Form Grader; Joint Sealing Machine; Outboard Motor Boat; Power Sweeper (Riding Type); Roller (Rock); Ross Carrier; Skid Mounted or Trailer Mounted Concrete Pump; Skid Steer Machine with all Attachments; Switchman or Brakeman; Throttle Valve Person; Tractair & Road Widening Trencher; Tractor (50 H.P. or Over); Truck Crane Oiler; Tugger; Welding Machine; Well Points;& Whirley Oiler

GROUP 3 -All Off Road Material Handling Equipment, including Articulating Dump Trucks; Greaser on Grease Facilities servicing Heavy Equipment

GROUP 4 - Bituminous Distributor; Burlap & Curing Machine; Cement Gun; Concrete Saw; Conveyor; Deckhand Oiler; Grout Pump; Hydraulic Post Driver; Hydro Seeder; Mud Jack; Oiler; Paving Joint Machine; Power Form Handling Equipment; Pump; Roller (Earth); Steerman; Tamping Machine; Tractor (Under 50 H.P.); & Vibrator

CRANES - with booms 150 ft. & Over (Including JIB), and where the length of the boom in combination with the length of the piling equals or exceeds 150 ft. - \$1.00 above Group 1 rate

EMPLOYEES ASSIGNED TO WORK BELOW GROUND LEVEL ARE TO BE PAID 10% ABOVE BASIC WAGE RATE. THIS DOES NOT APPLY TO OPEN CUT WORK.

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IRON0070-005 06/01/2014

BUTLER COUNTY (Eastern eighth, including the Townships of Decker, Lee & Tilford);  
EDMONSON COUNTY (Northern three-fourths, including the Townships of Asphalt, Bee Spring, Brownsville, Grassland, Huff, Kyrock, Lindseyville, Mammoth Cave, Ollie, Prosperity, Rhoda, Sunfish & Sweden)

	Rates	Fringes
IRONWORKER		
Structural; Ornamental;		
Reinforcing; Precast		
Concrete Erectors.....	\$ 26.97	19.75

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IRON0103-004 04/01/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, OHIO, UNION & WEBSTER COUNTIES  
BUTLER COUNTY (Townships of Aberdeen, Bancock, Casey, Dexterville, Dunbar, Elfie, Gilstrap, Huntsville, Logansport, Monford, Morgantown, Provo, Rochester, South Hill & Welchs Creek);  
CALDWELL COUNTY (Northeastern third, including the Township of Creswell);  
CHRISTIAN COUNTY (Northern third, including the Townships of Apex, Crofton, Kelly, Mannington & Wynns);  
CRITTENDEN COUNTY (Northeastern half, including the Townships of Grove, Mattoon, Repton, Shady Grove & Tribune);  
MUHLENBERG COUNTY (Townships of Bavier, Beech Creek Junction, Benton, Brennen, Browder, Central City, Cleaton, Depoy, Drakesboro, Eunis, Graham, Hillside, Luzerne, Lynn City, Martwick, McNary, Millport, Moorman, Nelson, Paradise, Powderly, South Carrollton, Tarina & Weir)

	Rates	Fringes
Ironworkers:.....	\$ 27.82	16.555

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IRON0492-003 05/01/2013

ALLEN, LOGAN, SIMPSON, TODD & WARREN COUNTIES  
BUTLER COUNTY (Southern third, including the Townships of Boston, Berrys Lick, Dimple, Jetson, Quality, Sharer, Sugar Grove & Woodbury);  
CHRISTIAN COUNTY (Eastern two-thirds, including the Townships of Bennettstown, Caskey, Herndon, Hopkinsville, Howell, Masonville, Pembroke & Thompsonville);  
EDMONSON COUNTY (Southern fourth, including the Townships of

Chalybeate & Rocky Hill);  
 MUHLENBERG COUNTY (Southern eighth, including the Townships of  
 Dunnior, Penrod & Rosewood)

	Rates	Fringes
Ironworkers:.....	\$ 23.84	10.96

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 IRON0782-006 05/01/2014

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN,  
 LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES  
 CALDWELL COUNTY (Southwestern two-thirds, including the  
 Townships of Cedar Bluff, Cider, Claxton, Cobb, Crowtown,  
 Dulaney, Farmersville, Fredonia, McGowan, Otter Pond &  
 Princeton);  
 CHRISTIAN COUNTY (Western third, Excluding the Townships of  
 Apex, Crofton, Kelly, Mannington, Wynns, Bennettstown, Casky,  
 Herndon, Hopkinsville, Howell, Masonville, Pembroke &  
 Thompsonville);  
 CRITTENDEN COUNTY (Southwestern half, including the Townships  
 of Crayne, Dycusburg, Frances, Marion, Mexico, Midway,  
 Sheridan & Told)

	Rates	Fringes
Ironworkers:		
Projects with a total contract cost of \$20,000,000.00 or above.....	\$ 27.09	20.66
All Other Work.....	\$ 25.50	19.02

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 LABO0189-005 07/01/2014

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN,  
 LIVINGSTON, LYON, MARSHALL & MCCRACKEN COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 21.50	12.26
GROUP 2.....	\$ 21.75	12.26
GROUP 3.....	\$ 21.80	12.26
GROUP 4.....	\$ 22.40	12.26

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement  
 Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter  
 Tender; Cement Mason Tender; Cleaning of Machines;  
 Concrete; Demolition; Dredging; Environmental - Nuclear,  
 Radiation, Toxic & Hazardous Waste - Level D; Flagperson;  
 Grade Checker; Hand Digging & Hand Back Filling; Highway  
 Marker Placer; Landscaping, Mesh Handler & Placer; Puddler;  
 Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail  
 & Fence Installer; Signal Person; Sound Barrier Installer;  
 Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper;  
 Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer);

Brickmason Tender; Mortar Mixer Operator; Scaffold Builder;  
Burner & Welder; Bushhammer; Chain Saw Operator; Concrete  
Saw Operator; Deckhand Scow Man; Dry Cement Handler;  
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste  
- Level C; Forklift Operator for Masonary; Form Setter;  
Green Concrete Cutting; Hand Operated Grouter & Grinder  
Machine Operator; Jackhammer; Pavement Breaker; Paving  
Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven  
Georgia Buggy & Wheel Barrow; Power Post Hole Digger;  
Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind  
Trencher; Sand Blaster; Concrete Chipper; Surface  
Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite  
Operator & Mixer; Grout Pump Operator; Blaster; Side Rail  
Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free  
Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher;  
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste  
- Levels A & B; Miner & Driller (Free Air); Tunnel Blaster;  
& Tunnel Mucker (Free Air); Directional & Horizontal  
Boring; Air Track Drillers (All Types); Powdermen &  
Blasters; Troxler & Concrete Tester if Laborer is Utilized

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LAB00189-006 07/01/2014

ALLEN, BUTLER, CALDWELL, CHRISTIAN, DAVIESS, EDMONSON, HANCOCK,  
HOPKINS, LOGAN, MCLEAN, MUHLENBERG, OHIO, SIMPSON, TODD, TRIGG  
& WARREN COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 22.66	11.10
GROUP 2.....	\$ 22.91	11.10
GROUP 3.....	\$ 22.96	11.10
GROUP 4.....	\$ 23.56	11.10

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement  
Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter  
Tender; Cement Mason Tender; Cleaning of Machines;  
Concrete; Demolition; Dredging; Environmental - Nuclear,  
Radiation, Toxic & Hazardous Waste - Level D; Flagperson;  
Grade Checker; Hand Digging & Hand Back Filling; Highway  
Marker Placer; Landscaping, Mesh Handler & Placer; Puddler;  
Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail  
& Fence Installer; Signal Person; Sound Barrier Installer;  
Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper;  
Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer);  
Brickmason Tender; Mortar Mixer Operator; Scaffold Builder;  
Burner & Welder; Bushhammer; Chain Saw Operator; Concrete  
Saw Operator; Deckhand Scow Man; Dry Cement Handler;  
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste  
- Level C; Forklift Operator for Masonary; Form Setter;  
Green Concrete Cutting; Hand Operated Grouter & Grinder  
Machine Operator; Jackhammer; Pavement Breaker; Paving

Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

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LABO0561-001 07/01/2014

CRITTENDEN, HENDERSON, UNION & WEBSTER COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 21.36	12.65
GROUP 2.....	\$ 21.61	12.65
GROUP 3.....	\$ 21.66	12.65
GROUP 4.....	\$ 22.26	12.65

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher;  
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste  
- Levels A & B; Miner & Driller (Free Air); Tunnel Blaster;  
& Tunnel Mucker (Free Air); Directional & Horizontal  
Boring; Air Track Drillers (All Types); Powdermen &  
Blasters; Troxler & Concrete Tester if Laborer is Utilized

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PAIN0032-002 05/01/2013

BALLARD COUNTY

	Rates	Fringes
Painters:		
Bridges.....	\$ 30.56	15.18
All Other Work.....	\$ 28.26	15.18
Spray, Blast, Steam, High & Hazardous (Including Lead Abatement) and All Epoxy - \$1.00 Premium		

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PAIN0118-003 06/01/2014

EDMONSON COUNTY:

	Rates	Fringes
Painters:		
Brush & Roller.....	\$ 18.50	12.02
Spray, Sandblast, Power Tools, Waterblast & Steam Cleaning.....	\$ 19.00	12.02

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PAIN0156-006 04/01/2014

DAVIESS, HANCOCK, HENDERSON, MCLEAN, OHIO, UNION & WEBSTER  
COUNTIES

	Rates	Fringes
Painters:		
BRIDGES		
GROUP 1.....	\$ 27.20	12.51
GROUP 2.....	\$ 27.45	12.51
GROUP 3.....	\$ 28.20	12.51
GROUP 4.....	\$ 29.20	12.51
ALL OTHER WORK:		
GROUP 1.....	\$ 26.05	12.51
GROUP 2.....	\$ 26.30	12.51
GROUP 3.....	\$ 27.05	12.51
GROUP 4.....	\$ 28.05	12.51

PAINTER CLASSIFICATIONS

GROUP 1 - Brush & Roller

GROUP 2 - Plasterers

GROUP 3 - Spray; Sandblast; Power Tools; Waterblast;  
Steamcleaning; Brush & Roller of Mastics, Creosotes, Kwinch

Koate & Coal Tar Epoxy

GROUP 4 - Spray of Mastics, Creosotes, Kwinch Koate & Coal  
Tar Epoxy

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PAIN0456-003 07/01/2011

ALLEN, BUTLER, LOGAN, MUHLENBERG, SIMPSON, TODD & WARREN  
COUNTIES:

	Rates	Fringes
Painters:		
BRIDGES		
Brush & Roller.....	\$ 22.55	9.65
Spray; Sandblast; Power Tools; Waterblast & Steam		
Cleaning.....	\$ 23.55	9.65
ALL OTHER WORK		
Brush & Roller.....	\$ 17.55	9.65
Spray; Sandblast; Power Tools; Waterblast & Steam		
Cleaning.....	\$ 18.55	9.65

ALL OTHER WORK - HIGH TIME PAY  
Over 35 feet (up to 100 feet) - \$1.00 above base wage  
100 feet and over - \$2.00 above base wage

DURING SPRAY PAINTING AND SANDBLASTING OPERATIONS, POT  
TENDERS SHALL RECEIVE THE SAME WAGE RATES AS THE SPRAY  
PAINTER OR NOZZLE OPERATOR

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PAIN0500-002 06/01/2014

CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON,  
GRAVES, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCRACKEN  
& TRIGG COUNTIES:

	Rates	Fringes
Painters:		
Bridges.....	\$ 26.45	12.05
All Other Work.....	\$ 20.20	12.05

Waterblasting units with 3500 PSI and above - \$.50 premium  
Spraypainting and all abrasive blasting - \$1.00 premium  
Work 40 ft. and above ground level - \$1.00 premium

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PLUM0184-002 07/01/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN,  
FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN  
and TRIGG COUNTIES

	Rates	Fringes
Plumber; Steamfitter.....	\$ 33.11	14.83

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PLUM0502-004 08/01/2013

ALLEN, BUTLER, EDMONSON, SIMPSON & WARREN

	Rates	Fringes
Plumber; Steamfitter.....	\$ 32.00	17.17

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PLUM0633-002 08/01/2013

DAVIESS, HANCOCK, HENDERSON, HOPKINS, LOGAN, MCLEAN,  
MUHLENBERG, OHIO, TODD, UNION & WEBSTER COUNTIES:

	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 29.87	14.25

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TEAM0089-003 03/30/2014

ALLEN, BUTLER, EDMONSON, LOGAN, SIMPSON & WARREN COUNTIES

	Rates	Fringes
Truck drivers:		
Zone 1:		
Group 1.....	\$ 19.58	17.83
Group 2.....	\$ 19.76	17.83
Group 3.....	\$ 19.84	17.83
Group 4.....	\$ 19.86	17.83

GROUP 1 - Greaser; Tire Changer

GROUP 2 - Truck Mechanic; Single Axle Dump; Flat Bed; All  
Terrain Vehicles when used to haul materials; Semi Trailer  
or Pole Trailer when used to pull building materials and  
equipment; Tandem Axle Dump; Driver of Distributors

GROUP 3 - Mixer All Types

GROUP 4 - Winch and A-Frame when used in transporting  
materials; Ross Carrier; Fork Lift when used to transport  
building materials; Driver on Pavement Breaker; Euclid and  
Other Heavy Earth Moving Equipment; Low Boy; Articulator  
Cat; Five Axle Vehicle

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TEAM0215-003 03/31/2013

DAVIESS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO  
& WEBSTER COUNTIES

	Rates	Fringes
TRUCK DRIVER		
Group 1.....	\$ 20.93	16.85
Group 2.....	\$ 21.16	16.85
Group 3.....	\$ 21.23	16.85
Group 4.....	\$ 21.24	16.85

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Driver of Distributors; Mixer All Types

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; 5 Axle Vehicle; Winch and A- Frame when used in transporting materials; Ross Carrier; Fork Lift when used to transport building materials; Driver on Pavement Breaker

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TEAM0236-001 03/31/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN, TODD & TRIGG COUNTIES

	Rates	Fringes
TRUCK DRIVER		
Group 1.....	\$ 19.38	16.85
Group 2.....	\$ 19.56	16.85
Group 3.....	\$ 19.56	16.85
Group 4.....	\$ 19.66	16.85
Group 5.....	\$ 19.64	16.85

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Drivers of Distributors

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; Five Axle Vehicle; Winch and A-Frame when used in transporting materials; Ross Carrier

GROUP 5: Mixer All Types

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.  
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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).  
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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

#### Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

#### Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

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#### WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

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

These rates are listed pursuant to the Kentucky Determination No. CR-14-I-HWY dated July 14, 2014.

No laborer, workman or mechanic shall be paid at a rate less than that of a Journeyman except those classified as bona fide apprentices.

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

Before using apprentices on the job the contractor shall present to the Contracting Officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U. S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U. S. Bureau of Apprenticeship and Training.

The contractor shall submit to the Contracting Officer, written evidence of the established apprenticeship-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

**TO: EMPLOYERS/EMPLOYEES**

**PREVAILING WAGE SCHEDULE:**

**The wages indicated on this wage schedule are the least permitted to be paid for the occupations indicated. When an employee works in more than one classification, the employer must record the number of hours worked in each classification at the prescribed hourly base rate.**

**OVERTIME:**

**Overtime is to be paid after an employee works eight (8) hours a day or forty (40) hours a week, whichever gives the employee the greater wages. At least time and one-half the base rate is required for all overtime. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. Wage violations or questions should be directed to the designated Engineer or the undersigned.**

Diana Castle Radcliffe, P.E.  
Director, Division of Construction Procurement  
Frankfort, Kentucky 40622

**PART IV**  
**INSURANCE**

## INSURANCE

The Contractor shall procure and maintain the following insurance in addition to the insurance required by law:

- 1) Commercial General Liability-Occurrence form – not less than \$2,000,000 General aggregate, \$2,000,000 Products & Completed Aggregate, \$1,000,000 Personal & Advertising, \$1,000,000 each occurrence.
- 2) Automobile Liability- \$1,000,000 per accident
- 3) Employers Liability:
  - a) \$100,000 Each Accident Bodily Injury
  - b) \$500,000 Policy limit Bodily Injury by Disease
  - c) \$100,000 Each Employee Bodily Injury by Disease
- 4) The insurance required above must be evidenced by a Certificate of Insurance and this Certificate of Insurance must contain one of the following statements:
  - a) "policy contains no deductible clauses."
  - b) "policy contains \_\_\_\_\_ (amount) deductible property damage clause but company will pay claim and collect the deductible from the insured."
- 5) KENTUCKY WORKMEN'S COMPENSATION INSURANCE. The contractor shall furnish evidence of coverage of all his employees or give evidence of self-insurance by submitting a copy of a certificate issued by the Workmen's Compensation Board.

The cost of insurance is incidental to all contract items. All subcontractors must meet the same minimum insurance requirements.

**PART V**  
**BID ITEMS**

**PROPOSAL BID ITEMS**

141296

Page 1 of 4

Report Date 11/18/14

**Section: 0001 - PAVING**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	3,786.00	TON		\$	
0020	00078		CRUSHED AGGREGATE SIZE NO 2	9,375.00	TON		\$	
0030	00190		LEVELING & WEDGING PG64-22	121.00	TON		\$	
0040	00221		CL2 ASPH BASE 0.75D PG64-22	4,930.00	TON		\$	
0050	00272		CL2 ASPH BIND 0.50D PG64-22	350.00	TON		\$	
0060	00301		CL2 ASPH SURF 0.38D PG64-22	1,091.00	TON		\$	
0070	01000		PERFORATED PIPE-4 IN	416.00	LF		\$	
0080	01740		CORED HOLE DRAINAGE BOX CON-4 IN	52.00	EACH		\$	
0090	01810		STANDARD CURB AND GUTTER	8,610.00	LF		\$	
0100	02075		JPC PAVEMENT-6 IN	484.00	SQYD		\$	
0110	02101		CEM CONC ENT PAVEMENT-8 IN	1,763.00	SQYD		\$	
0120	02599		FABRIC-GEOTEXTILE TYPE IV	29,055.00	SQYD		\$	
0130	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0140	02677		ASPHALT PAVE MILLING & TEXTURING	131.00	TON		\$	
0150	06510		PAVE STRIPING-TEMP PAINT-4 IN	38,763.00	LF		\$	
0160	06514		PAVE STRIPING-PERM PAINT-4 IN	8,955.00	LF		\$	
0170	06565		PAVE MARKING-THERMO X-WALK-6 IN	531.00	LF		\$	
0180	06568		PAVE MARKING-THERMO STOP BAR-24IN	77.00	LF		\$	
0190	06570		PAVE MARKING-PAINT CROSS-HATCH	1,534.00	SQFT		\$	
0200	06574		PAVE MARKING-THERMO CURV ARROW	20.00	EACH		\$	
0210	06575		PAVE MARKING-THERMO COMB ARROW	2.00	EACH		\$	
0220	06576		PAVE MARKING-THERMO ONLY	1.00	EACH		\$	
0230	06588		PAVEMENT MARKER TY IVA-BY TEMP	742.00	EACH		\$	
0240	06591		PAVEMENT MARKER TYPE V-BY	148.00	EACH		\$	

**Section: 0002 - ROADWAY**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0250	01310		REMOVE PIPE	724.00	LF		\$	
0260	01791		ADJUST MANHOLE FRAME TO GRADE	13.00	EACH		\$	
0270	02058		REMOVE PCC PAVEMENT	128.00	SQYD		\$	
0280	02091		REMOVE PAVEMENT	5,131.00	SQYD		\$	
0290	02230		EMBANKMENT IN PLACE	16,056.00	CUYD		\$	
0300	02483		CHANNEL LINING CLASS II	32.00	TON		\$	
0310	02484		CHANNEL LINING CLASS III	619.00	TON		\$	
0320	02545		CLEARING AND GRUBBING (APPROXIMATELY 11 ACRES)	1.00	LS		\$	
0330	02562		TEMPORARY SIGNS	216.00	SQFT		\$	
0340	02585		EDGE KEY	116.00	LF		\$	
0350	02596		FABRIC-GEOTEXTILE TYPE I	953.00	SQYD		\$	
0360	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	5,489.00	SQYD	\$2.00	\$	\$10,978.00
0370	02625		REMOVE HEADWALL	12.00	EACH		\$	
0380	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0390	02690		SAFELOADING	8.00	CUYD		\$	
0400	02701		TEMP SILT FENCE	4,200.00	LF		\$	
0410	02703		SILT TRAP TYPE A	13.00	EACH		\$	
0420	02704		SILT TRAP TYPE B	40.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0430	02705		SILT TRAP TYPE C	61.00	EACH		\$	
0440	02706		CLEAN SILT TRAP TYPE A	39.00	EACH		\$	
0450	02707		CLEAN SILT TRAP TYPE B	120.00	EACH		\$	
0460	02708		CLEAN SILT TRAP TYPE C	183.00	EACH		\$	
0470	02709		CLEAN TEMP SILT FENCE	4,200.00	LF		\$	
0480	02720		SIDEWALK-4 IN CONCRETE	4,541.00	SQYD		\$	
0490	02726		STAKING	1.00	LS		\$	
0500	04953		TEMP RELOCATION OF SIGNAL HEAD	5.00	EACH		\$	
0510	05950		EROSION CONTROL BLANKET	1,462.00	SQYD		\$	
0520	05952		TEMP MULCH	3,567.00	SQYD		\$	
0530	05953		TEMP SEEDING AND PROTECTION	17,835.00	SQYD		\$	
0540	05963		INITIAL FERTILIZER	2.00	TON		\$	
0550	05964		20-10-10 FERTILIZER	2.00	TON		\$	
0560	05985		SEEDING AND PROTECTION	38,185.00	SQYD		\$	
0570	05990		SODDING	4,380.00	SQYD		\$	
0580	05992		AGRICULTURAL LIMESTONE	24.00	TON		\$	
0590	08100		CONCRETE-CLASS A	34.00	CUYD		\$	
0600	08150		STEEL REINFORCEMENT	932.00	LB		\$	
0610	10020NS		FUEL ADJUSTMENT	12,882.00	DOLL	\$1.00	\$	\$12,882.00
0620	10030NS		ASPHALT ADJUSTMENT	25,381.00	DOLL	\$1.00	\$	\$25,381.00
0630	20550ND		SAWCUT PAVEMENT	4,386.00	LF		\$	
0640	23131ER701		PIPELINE VIDEO INSPECTION	1,927.00	LF		\$	
0650	23158ES505		DETECTABLE WARNINGS	302.00	SQFT		\$	
0660	23274EN11F		TURF REINFORCEMENT MAT 1	1,592.00	SQYD		\$	

**Section: 0003 - DRAINAGE**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0670	00521		STORM SEWER PIPE-15 IN	226.00	LF		\$	
0680	00522		STORM SEWER PIPE-18 IN	3,083.00	LF		\$	
0690	00524		STORM SEWER PIPE-24 IN	102.00	LF		\$	
0700	00528		STORM SEWER PIPE-36 IN	31.00	LF		\$	
0710	00529		STORM SEWER PIPE-42 IN	201.00	LF		\$	
0720	00551		STORM SEWER PIPE-15 IN EQUIV	41.00	LF		\$	
0730	00552		STORM SEWER PIPE-18 IN EQUIV	80.00	LF		\$	
0740	00556		STORM SEWER PIPE-30 IN EQUIV	36.00	LF		\$	
0750	00558		STORM SEWER PIPE-36 IN EQUIV	49.00	LF		\$	
0760	01544		DROP BOX INLET TYPE 11	9.00	EACH		\$	
0770	01545		DROP BOX INLET TYPE 11 MOD	3.00	EACH		\$	
0780	01559		DROP BOX INLET TYPE 13G	33.00	EACH		\$	
0790	01568		DROP BOX INLET TYPE 13S	10.00	EACH		\$	
0800	01718		REMOVE INLET	3.00	EACH		\$	
0810	01719		ADJUST INLET	1.00	EACH		\$	
0820	01767		MANHOLE TYPE C	1.00	EACH		\$	
0830	23562EC		DROP BOX INLET TYPE 12A MODIFIED	52.00	LF		\$	

**Section: 0004 - SEWER - RELOCATION**

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0840	01051		SEWER PIPE-6 IN (SDR-35 PVC LATERAL TRENCH)	250.00	LF		\$	
0850	01791		ADJUST MANHOLE FRAME TO GRADE (LESS THAN 1')	3.00	EACH		\$	
0860	01791		ADJUST MANHOLE FRAME TO GRADE (1' TO 2')	4.00	EACH		\$	
0870	01791		ADJUST MANHOLE FRAME TO GRADE (GREATER THAN 2')	3.00	EACH		\$	
0880	02220		FLOWABLE FILL (80 PSI)	17.00	CUYD		\$	
0890	05985		SEEDING AND PROTECTION	550.00	SQYD		\$	
0900	22139NN		CONNECT TO SEWER MAIN (LATERAL TO EXISTING)	1.00	EACH		\$	
0910	24448EC		CLEANOUT ASSEMBLY (4" PVC - RECONNECT EXISTING LATERAL)	16.00	EACH		\$	
0920	24599EC		CURE IN PLACE PIPE LINER (8 INCH SEWER REHABILITATION)	3,409.00	LF		\$	
0930	24599EC		CURE IN PLACE PIPE LINER (6 INCH SEWER LATERAL REHABILITATION)	1,132.30	LF		\$	
0940	24762EC		SEWER MANHOLE REHABILITATION (MH LINING)	77.50	EACH		\$	
0950	24765EC		CIPP LATERAL RECONST FROM MAINLINE (INSTALL 3' INTO LATERAL)	16.00	EACH		\$	

**Section: 0005 - WATERLINE - RELOCATION**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0960	01086		STEEL ENCASMENT PIPE-OPEN CUT-24 IN	30.00	LF		\$	
0970	02555		CONCRETE-CLASS B	10.00	CUYD		\$	
0980	02606		FIRE HYDRANT	3.00	EACH		\$	
0990	03432		REMOVE AND RELOCATE METER (EXISITING METER SETTING)	13.00	EACH		\$	
1000	03546		BEND 22.50 DEG 8 IN (MJ FITTING)	2.00	EACH		\$	
1010	03550		CUT & CAP EXIST WATER MAIN	3.00	EACH		\$	
1020	03551		TAPPING SLEEVE & VALVE (8" X 6")	3.00	EACH		\$	
1030	03563		BEND 45 DEG 8 IN (8" MJ FITTING)	1.00	EACH		\$	
1040	03570		BEND 90 DEG 8 IN (MJ FITTING)	1.00	EACH		\$	
1050	05985		SEEDING AND PROTECTION	1,495.00	SQYD		\$	
1060	20123EC		SOLID SLEEVE-8 IN (MJ)	2.00	EACH		\$	
1070	20333EN		SERVICE LINE (1.5" TYPE "K" SOFT COPPER WATER SERVICE LINE - BORED)	1,300.00	LF		\$	
1080	20333EN		SERVICE LINE (1.5" TYPE "K" SOFT COPPER WATER SERVICE LINE - OPEN CUT)	720.00	LF		\$	
1090	20966ND		THRUST RESTRAINT GLAND-8 IN	14.00	EACH		\$	
1100	21180ND		TAPPING SLEEVE & VALVE 8 X 8	2.00	EACH		\$	
1110	21346ND		WATER SERVICE RECONNECT-3/4 IN-1 IN (EXISTING)	13.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1120	21998NN		SITE RESTORATION (PHASE 1)	1.00	LS		\$	
1130	23129ND		VALVE BOX AND LID	5.00	EACH		\$	
1140	23308EC		WATER METER WITH BOX (5/8" X 3/4" ASSEMBLY)	10.00	EACH		\$	
1150	24632EC		WATER MAIN (8" CL 350 DIP - OPEN CUT)	80.00	LF		\$	
1160	24648EC		FOSTER ADAPTER (8 INCH)	3.00	EACH		\$	
1170	24763EC		WATER METER ASSEMBLY (1 INCH)	4.00	EACH		\$	
1180	24764EC		JOINT RESTRAINT GLAND (8 INCH)	12.00	EACH		\$	
1190	24766EC		DISINFECT & TEST-RELOCATED WATER	1.00	EACH		\$	

**Section: 0006 - DEMOBILIZATION &/OR MOBILIZATION**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1200	02568		MOBILIZATION	1.00	LS		\$	
1210	02569		DEMOBILIZATION	1.00	LS		\$	