



CALL NO. 300

CONTRACT ID. 151265

BULLITT COUNTY

FED/STATE PROJECT NUMBER 121GR15D075-FD04

DESCRIPTION PRESTON HIGHWAY (KY 61)

WORK TYPE GRADE & DRAIN AND PAVEMENT ALTERNATES

PRIMARY COMPLETION DATE 11/30/2018

LETTING DATE: November 20,2015

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN STANDARD TIME November 20,2015. 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 - 05

CONTRACT ID - 151265

121GR15D075-FD04

COUNTY - BULLITT

PCN - DE01500611575

FD04 015 0061 014-017

PRESTON HIGHWAY (KY 61) (MP 14.430) KY-61 BEGINS SOUTH OF KY-44 AND ENDS NORTH OF THE NEWLY CONSTRUCTED CONESTOGA PARKWAY (MP 16.667), A DISTANCE OF 02.20 MILES.GRADE & DRAIN AND PAVEMENT ALTERNATES SYP NO. 05-00117.10.

GEOGRAPHIC COORDINATES LATITUDE 38:00:16.00 LONGITUDE 85:42:33.00

PCN - DE01500611576

FD04 SSP 015 0061 016-018

PRESTON HIGHWAY (KY 61) (MP 16.667) KY-61 BEGINS NORTH OF THE CONESTOGA PARKWAY AND ENDS AT EXISTING KY-61 SOUTH OF BROOKS RUN CREEK (MP 17.880), A DISTANCE OF 01.30 MILES.GRADE & DRAIN AND PAVEMENT ALTERNATES SYP NO. 05-00117.20.

GEOGRAPHIC COORDINATES LATITUDE 38:01:26.00 LONGITUDE 85:41:42.00

COMPLETION DATE(S):

COMPLETED BY 11/30/2018

60 CALENDAR DAYS

APPLIES TO ENTIRE CONTRACT

WEST HEBRON LANE (KY 1450)
CLOSURE

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)

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

JOINT VENTURE BIDDING

Joint venture bidding is permissible. All companies in the joint venture must be prequalified in one of the work types in the Qualifications for Bidders for the project. The bidders must get a vendor ID for the joint venture from the Division of Construction Procurement and register the joint venture as a bidder on the project. Also, the joint venture must obtain a digital ID from Bid Express to submit a bid. A joint bid bond of 5% may be submitted for both companies or each company may submit a separate bond of 5%.

UNDERGROUND FACILITY DAMAGE PROTECTION

The contractor 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 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. The Department will attempt to answer all submitted questions. The Department reserves the right not to answer if the question is not pertinent or does not aid in clarifying the project intent.

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

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

HARDWOOD REMOVAL RESTRICTIONS

The US Department of Agriculture has imposed a quarantine in Kentucky and several surrounding states, to prevent the spread of an invasive insect, the emerald ash borer.

Hardwood cut in conjunction with the project may not be removed from the state. Chipping or burning on site is the preferred method of disposal.

INSTRUCTIONS FOR EXCESS MATERIAL SITES AND BORROW SITES

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

ACCESS TO RECORDS

The contractor, as defined in KRS 45A.030 (9) agrees that the contracting agency, the Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this contract for the purpose of financial audit or program review. Records and other prequalification information confidentially disclosed as part of the bid process shall not be deemed as directly pertinent to the contract and shall be exempt from disclosure as provided in KRS 61.878(1)(c). The contractor also recognizes that any books, documents, papers, records, or other evidence, received during a financial audit or program review shall be subject to the Kentucky Open Records Act, KRS 61.870 to 61.884.

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

EXPEDITE PROJECT WORK ORDER

The Contractor may request that the Department expedite the work order for this project to allow for maximization of time to complete the work. In order for the Department to accomplish this task, the Contractor may be required to “hand carry” all required project documentation to facilitate the process. Immediately UPON NOTIFICATION OF AWARD OF THE CONTRACT, deliver required project documentation to:

Division of Construction Procurement
200 Mero St.
Frankfort, KY 40602

PROJECT TRAFFIC COORDINATOR (PTC)

Be advised this project is a significant project pursuant to section 112.03.12.

ASPHALT MIXTURE

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

INCIDENTAL SURFACING

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

JPC RIDE QUALITY

The Department will apply JPC Ride Quality requirements on this project in accordance with Section 501.03.19(B).

ASPHALT PAVEMENT RIDE QUALITY CATEGORY B

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

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 Tree Removal

**Bullitt County
KY 61 Reconstruction
Item No. 5-117.10 & 5-117.20**

NO CLEARING OF TREES 3 INCHES OR GREATER (DIAMETER BREAST
HEIGHT) FROM JUNE 1- JULY 31.

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

**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".

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
PROPOSED PROJECT
BULLITT COUNTY
KENTUCKY HWY. 61 (PRESTON HWY.)
5-117.1 & 5-117.2
Contractor Build Utility Procurement

Revised 9/28/2015

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1. UTILITIES

1.1 GENERAL REQUIREMENTS

A number of existing utilities are located within or in the vicinity of the project right-of-way, some pursuant to statutory rights and some pursuant to property rights. Certain of those existing utilities shall need to be relocated or otherwise adjusted in order to accommodate the project. This section establishes procedures and requirements for adjusting utilities including such processes as coordination with utility owners, administration of the engineering, construction and other activities necessary for utility adjustments, and required documentation. Details regarding the contractor's plan for utility coordination and relocations shall be addressed in the Utility and Railroad Coordination Plan prepared by the contractor for the project.

The contractor shall cause all utility adjustments necessary to accommodate construction, operation, maintenance and/or use of the project, in both its initial configuration and in its ultimate configuration. The contractor shall be responsible for preparation and execution of all agreements with the utility owners impacted by the project. Some utility adjustments may be performed by the utility owner with its own forces and/or contractors and consultants (i.e., utility owner-managed); all others shall be performed by the contractor with its own forces and/or subcontractors and consultants (subject to any approval rights required by the utility owner for those working on its facilities) (i.e., contractor -managed). The allocation of responsibility for the utility adjustment work between contractor and the utility owners shall be specified in the utility agreements executed by the contractor with the respective utility owner. All costs associated with the relocation of utilities for this project shall be the responsibility of the contractor unless specifically exempted elsewhere in this document. The contractor shall clearly demonstrate in the schedule prepared for the project how the utility relocation work is to be accomplished. No contract time extensions shall be granted to the contractor due to relocation of utilities for the project.

The contractor's obligations regarding reimbursement to utility owners for all costs of utility adjustment work shall be as set forth in the utility agreements prepared for the project by the contractor and in conformance with FHWA's *Program Guide for Utility Relocation and Accommodation for Federal-Aid Projects*. In general, in order to facilitate the timely relocation of the utilities for the project, KYTC has advised all respective utility companies thought to be potentially impacted by the project that the costs associated with utility relocation work shall be reimbursed to the respective utility owner by the contractor. This includes both public and private utilities. However, as per FHWA's *Program Guide for Utility Relocation and Accommodation for Federal-Aid Project*, any "betterments" to the utilities made as part of the relocation work are not eligible project expenses and shall not be included in the project costs. The contractor and the respective utility owner shall clearly demonstrate in the agreements prepared for the project how any "betterments" planned for the utility facilities during the relocation work are paid for using non-project funds. The contractor shall be responsible for strictly adhering to this requirement. Should it be determined that project funds have been used for betterment of the utility facilities without prior approval by KYTC, an amount equal to the cost determined to be expended upon betterment of the utility facilities relocated for the project shall be deducted from the contractor's contract amount.

1.1.1 When Utility Adjustment is Required

A utility adjustment may be necessary to accommodate the project for either or both of the following reasons: (a) a physical conflict between the project and the utility, and/or (b) an incompatibility between the project and the utility based on constructability, future operation, safety, and maintenance. The physical limits of all utility adjustments shall extend as necessary to functionally replace the existing utility, whether inside or outside of the project right-of-way. Section 1.2.4.2 contains provisions that address the acquisition of easements for utilities to be installed outside of the project right-of-way.

Utilities may remain in their existing locations within the project right-of-way if the existing location shall not adversely affect the construction, operation, safety, maintenance and/or use of the project. For example, the City of Shepherdsville sewer is located within the roadway in some areas of the project, but the manholes are not located inside of driving lanes.

1.1.2 Certain Components of the Utility Adjustment Work

1.1.2.1 Coordination

The contractor shall communicate, cooperate, and coordinate with KYTC, the utility owners, and potentially affected third parties, as necessary for performance of the utility adjustment work. The contractor shall be responsible for preparing and securing execution of all necessary agreements.

Please be advised that the utility owner, as part of the review and comment for the utility agreement by KYTC, shall be responsible for obtaining an *Encroachment Permit* for all utility relocation work to be done within the public right-of-way. The contractor shall be responsible for all coordination needed to ensure that the *Encroachment Permits* and any other approvals needed from the appropriate regulatory agencies are received and approved by the proper authority prior to any utility relocation work within the public right-of-way taking place.

1.1.2.2 Betterments

The utility owner shall be reimbursed only for the cost of constructing the most economical type of facilities that satisfactorily meet the service requirements of the former facilities unless the utility owner specifies a lesser replacement. Please see the KYTC Policy Manuals and FHWA's *Program Guide for Utility Relocation and Accommodation for Federal-Aid Projects* for additional requirements in this regard. If the utility owner proposes to include enhancements or "betterment", all costs associated with the betterment are the responsibility of the utility owner and shall not be included in the project cost. The contractor shall perform all coordination necessary to ensure that any utility betterment planned for the project by the utility owner are adequately addressed in the utility agreement and properly documented in the Encroachment Permit prior to beginning the relocation.

1.1.2.3 Protection in Place

The contractor shall be responsible for protection in place of all utilities impacted by the project as necessary for their continued safe operation and structural integrity. The contractor shall be responsible for obtaining an Encroachment Permit for all work activities performed within the public right-of-way for utility protection in place. Please see the utility status report in Section 1.5.2 for additional protection in place requirements for each respective utility company.

1.1.2.4 *Abandonment and Removal*

As applicable to work being performed by the contractor, the contractor shall make all arrangements and perform all work necessary to complete each abandonment or removal (and disposal) of a utility in accordance with the approved utility agreement. This shall include obtaining governmental approvals and consent from the affected utility owner and any affected landowner(s), or shall confirm that the utility owner has completed these tasks.

1.1.2.5 *Service Lines and Utility Appurtenances*

As applicable to work being performed by the contractor, whenever required to accommodate construction, operation, maintenance and/or use of the project, the contractor shall cause service line adjustments and utility appurtenance adjustments while consistently maintaining service to properties. On completion of these, the contractor shall cause full reinstatement of the roadway, including reconstruction of curb, gutter, sidewalks, entrances and landscaping, whether the utility adjustment work is performed by the utility owner or by the contractor.

1.1.2.6 *Early Adjustments*

Please see Section 1.5.2 - Utility Status Report of this project scope document for additional information regarding preliminary design and early adjustments that have already been performed by the respective utility companies.

1.1.3 *Agreements between the Contractor and Utility Owners*

Except as otherwise stated in this section or in the agreement, each utility adjustment shall be specifically addressed in a utility agreement. The contractor is responsible for preparing, negotiating, and obtaining execution by the utility owners, of all utility agreements, (including preparing all necessary exhibits and information about the project, such as reports, plans and surveys). A utility agreement is not required for any utility adjustment consisting solely of protection in place in the utility's original location within the project right-of-way, unless the utility owner is being reimbursed for costs incurred by it on account of such protection in place.

1.1.3.1 *Utility Agreements*

The contractor shall enter into utility agreements with each affected utility owner and each facility type (i.e. electric, gas, communications, etc.) to define the design, material, construction, inspection, and acceptance standards and procedures necessary to complete utility adjustments, as well as to define the contractor's and the utility owner's respective responsibilities for utility adjustment costs and utility adjustment activities such as design, material procurement, construction, inspection, and acceptance. Additional adjustments may be added to an existing utility agreements by a utility agreement amendment.

The contractor shall prepare each utility agreement using the standard form included in the reference documents. Promptly following issuance of notice to proceed, the contractor shall begin negotiations with each affected utility owner to reach agreement on one or more Utility Agreements. The contractor shall use good faith efforts to finalize a utility agreement with each affected utility owner within a reasonable time period after issuance of notice to proceed. Each utility agreement (including the utility adjustment

plans attached thereto) shall be subject to KYTC review and comment as part of the utility agreement /encroachment permit approval process.

1.1.3.2 Utility Agreement Amendments

Modification of an executed utility agreement or any component thereof shall be addressed using a utility agreement amendment. An utility agreement amendment may be used only when the allocation of responsibility for the utility adjustment work covered by that utility agreement amendment is the same as in the underlying utility agreement; otherwise, an additional utility agreement and new encroachment permit shall be required.

Each utility agreement amendment (including any utility adjustment plans attached thereto) shall be subject to KYTC approval as an amendment to the original encroachment permit.

1.1.4 Recordkeeping

The contractor shall maintain construction and inspection records in order to ascertain that utility adjustment work is accomplished in accordance with the terms and in the manner proposed on the approved utility adjustment plans and otherwise as required by the applicable utility agreement(s). The contractor may use the modified KYTC utility relocation progress report included in the reference documents. The contractor shall provide KYTC copies of the construction and inspection records monthly.

1.2 ADMINISTRATIVE REQUIREMENTS

1.2.1 Standards

All utility adjustment work shall comply with all applicable laws, agency encroachment permit requirements, these technical provisions, regulatory agency approvals, the applicable utility adjustment standards, and the requirements as set forth in the utility company standards and specifications.

1.2.2 Communications

1.2.2.1 Communication with Utility Owners: Meetings and Correspondence

The contractor is responsible for holding meetings and otherwise communicating with each utility owner as necessary to accomplish in a timely manner the utility adjustments necessary to construct the project. KYTC will participate in these meetings if deemed appropriate in order to facilitate the progress on the project.

At least five (5) business days in advance of each scheduled meeting, the contractor shall provide notice and an agenda for the meeting separately to KYTC and the appropriate utility owner. The contractor shall prepare minutes of all meetings with utility owners and shall keep copies of all correspondence between the contractor and any utility owner. Copies of these meeting minutes shall be forwarded to KYTC for the project files within one (1) week following the respective meeting.

1.2.3 Utility Adjustment Team

The contractor shall provide a utility adjustment team with appropriate qualifications and experience for the utility adjustment work required for this project. Please see Section 1.5.2 - Utility Status Report of this

project scope document for additional information regarding potential team members needed. The contractor shall provide the names and contact details, titles, job roles, and specific experience of the team members. Specifically, The contractor shall provide a Utility Design Coordinator (UDC) as described herein.

The UDC shall be responsible for coordinating the utility adjustment design with the overall highway design features during the planning, design, and construction phases of the work. This also includes coordination efforts to ensure that the design and relocation for each individual utility is compatible with other utility relocation work for the project.

1.2.4 Real Property Matters

The contractor shall provide the services described below in connection with existing and future occupancy of property by utilities.

1.2.4.1 Documentation of Existing Utility Property Interests

Please see Section 1.5.2 - Utility Status Report of this Project Scope Document. It shall be the contractor's responsibility to review the utility status report for completeness. In general, it shall be the contractor's responsibility to determine **all** existing utility property interest within the project right-of-way claimed by any utility owner.

1.2.4.2 Acquisition of Replacement Utility Property Interests

The contractor shall be responsible for working with each utility owner for acquiring any replacement utility property interests that are necessary for its utility adjustments. The contractor shall have the following responsibilities for each acquisition:

- A. The contractor shall coordinate with, and provide all project information needed to each utility owner as necessary for the utility owner to identify any replacement utility property interests required for its utility adjustments.
- B. If any of contractor -related entities assists a utility owner in acquiring a replacement utility property interest, such assistance shall be by separate contract outside of the work, and the contractor shall ensure that the following requirements are met:
 - a. The files and records must be kept separate and apart from all acquisition files and records for the project right-of-way.
 - b. The items used in acquisition of replacement utility property interests (e.g., appraisals, written evaluations and owner contact reports) must be separate from the purchase of the project right-of-way. Example agreements are available in the reference documents available on KYTC's Utilities and Rails website.
- C. The contractor shall reimburse the utility owner for all replacement utility property interests required for its utility adjustments. No betterment in terms of property interest shall be paid for using project funds.
- D. KYTC has acquired all necessary easements and right of way for the roadway construction, and KYTC has acquired or has been in the process of acquiring utility easements needed for this

project. At the time of this publication, some utility easements had not been acquired. The unacquired utility easements are as follows:

- a. Section 1: 1, 10, 13, 15, 16, 17, 18, 25, 26, 27, 29, 32, 42, 60, 65, 67 and 68
- b. Section 2: 114 and 124

1.2.5 Documentation of Requirements

The contractor shall prepare, and obtain execution by the utility owner of (and record in the appropriate jurisdiction, if applicable) all agreements including all necessary exhibits and information concerning the project (e.g., reports, plans, and surveys). Each agreement shall identify the subject utility(ies) by the applicable *Encroachment Permit Number*, and shall also identify any real property interests by parcel number or highway station number, or by other identification acceptable to KYTC.

1.3 DESIGN

1.3.1 Contractor's Responsibility for Utility Identification

The contractor bears sole responsibility for ascertaining, at its own expense, all pertinent details of utilities located within the project right-of-way or otherwise affected by the project, whether located on private property or within an existing public right-of-way and including all service lines.

1.3.2 Technical Criteria and performance Standards

All design plans for utility adjustment work, whether furnished by the contractor or by the utility owner, shall be consistent and compatible with the following:

- A. The project as designed and constructed
- B. Any utilities remaining in, or being installed in, the same vicinity
- C. All applicable governmental approvals/permits
- D. Private approvals of any third parties necessary for such work
- E. KYTC Policies and Procedures as set forth in applicable state utility and rail guidance manuals and as specified in the approved utility agreement.
- F. Adherence to *FHWA's Program Guide for Utility Relocation and Accommodation for Federal-Aid Projects*.

The contractor shall be responsible for validating that all utility adjustments performed as part of this project adhere to these criteria.

1.3.3 Utility Adjustment Plans

Utility adjustment plans, whether furnished by the contractor or by the utility owner, shall be signed and sealed by a registered professional engineer (PE), if required by the utility owner, regulatory agencies, or KYTC.

1.3.3.1 Plans Prepared by the Utility Owner

For all utility adjustment plans to be furnished by a utility owner, the contractor shall coordinate with the utility owner as necessary to confirm compliance with the project plans, including possible changes being proposed by the contractor. Those utility adjustment plans shall be attached to the applicable utility

agreement and estimate, which shall serve as the appropriate *Encroachment Permit* for KYTC approval. The contractor shall be responsible for coordination with the utility company to ensure that all KYTC comments to the utility owner are adequately addressed in the design and construction of the project, including, any modification, re-approval by the utility owner and re-submittal to KYTC as necessary to obtain KYTC approval.

1.3.3.2 Design Documents

Each proposed utility adjustment shall be shown in the design documents, regardless of whether the utility adjustment plans are prepared by the contractor or by the utility owner.

1.3.3.3 Certain Requirements for Underground Utilities

Casing as specified in accordance with the KYTC Permits Manual and the KYTC Utilities Manual shall be required for use on the project, where applicable.

1.3.3.4 Utility Agreement Submittals

Each utility adjustment shall be addressed in a utility agreement prepared jointly by the contractor and the utility owner and submitted to KYTC for review and comment. The contractor shall coordinate with the utility owner to prepare all components of each utility agreement. Completion of the review and approval process for the applicable utility agreement, as well as issuance of any required KYTC approvals, shall be required before the start of construction for the affected utility adjustment work.

In its sole discretion, KYTC has the authority to approve the placement of utilities within project right-of-way. Please see Section 1.5.2 - Utility Status Report of this project scope document. As detailed in the report, utility relocation concepts consistent with utility company and KYTC goals and objectives for the project have been explored. Further, it has been determined that each respective utility relocation can be accommodated in an acceptable manner to said companies and agencies. It shall be the responsibility of the contractor to work with the utility owner to prepare all required documentation to be included with each subsequent utility agreement submittal.

The contractor shall arrange for the utility owner to execute each utility agreement and subsequent *Encroachment Permit* required to do the work on the project.

Provisions governing the procedure for and timing of utility agreement submittals are in Section 1.5 - Deliverables.

All utility adjustments covered by the same initial utility agreement may be addressed in a single *Encroachment Permit*. Please refer to the KYTC Encroachment Permit Manual for additional information. In general, the utility agreement *package* required for each utility relocation shall include:

- A. *Encroachment Permit* Application (KYTC)
- B. Utility agreement (executed between the contractor and the utility owner)
- C. Utility adjustment plans and specifications as referenced in the utility agreement
- D. Roadway plans and profile and/or structure plans and x-sections clearly indicating existing and proposed utility location. For utilities deemed acceptable to remain in place by the utility owner

and the contractor, the location of the utility, both horizontally and vertically, along with any special construction requirements or protection needed to prevent damage to the facility during construction of the project, must be clearly defined.

- E. Utility relocation cost estimate as defined in the utility agreement including definition and separation of any betterment proposed.
- F. Submit six (6) complete utility agreement packages as described herein or as directed by KYTC. Once review and comment is complete, three (3) copies shall be returned to the contractor and utility company for their use.

1.4 CONSTRUCTION

1.4.1 General Construction Criteria

All utility adjustment construction performed by the contractor shall conform to the requirements listed below. In addition, the contractor is responsible for verifying that all utility adjustment construction performed by each utility owner conforms to the requirements described below. In case of nonconformance, the contractor shall cause the utility owner (and/or its contractors, as applicable) to complete all necessary corrective work or to otherwise take such steps as are necessary to conform to these requirements.

- A. All criteria identified in Section 1.3 – Design.
- B. The utility adjustment plans and agency requirements included in the *Encroachment Permit* approved by KYTC.
- C. Approved utility agreement amendments.
- D. All project safety and environmental requirements.
- E. Erosion prevention and sediment control requirements.
- F. Easement acquisition procedures.

1.4.2 Inspection of Utility Owners Construction

The contractor shall set forth procedures for inspection of all utility adjustment work performed by utility owners (and/or their contractors) to verify compliance with the applicable requirements described in Section 1.4.1 - General Construction Criteria. The inspection shall validate that the utility work adheres to the above criteria, is as designed, and conforms to the approved utility agreement and any approved amendments.

1.4.3 Scheduling Utility Adjustment Work

The utility adjustment work (other than construction) may begin at any time following issuance of an approved encroachment permit. The contractor shall not arrange for any utility owner to begin any demolition, removal, or other construction work for any utility adjustment until all of the following conditions are satisfied:

- A. The utility adjustment is covered by an executed utility agreement (and any conditions to commencement of such activities that are included in the utility agreement have been satisfied);
- B. Availability and access to affected replacement utility property interests or public right-of-way have been obtained.

- C. If any part of the construction work for the utility adjustment shall affect the project right-of-way, then approvals from the contractor right-of-way acquisition manager, in conjunction with KYTC has been received.
- D. The review and comment process has been completed and required approvals have been obtained for the *Encroachment Permit* covering the utility adjustment.
- E. All governmental and permitting approvals necessary for the utility adjustment construction have been obtained, and any pre-construction requirements contained in those approvals have been satisfied.
- F. The contractor shall verify that all utility adjustments address the project needs and are not in conflict with one another.
- G. The contractor shall conduct a preconstruction joint utility meeting to schedule and plan all utility owner adjustments. KYTC shall be invited to attend this meeting.
- H. All other conditions to that work stated in the RFP documents have been satisfied.

1.4.4 Standard of Care Regarding Utilities

The contractor shall carefully and skillfully carry out all work impacting utilities and shall mark, support, secure, exercise care, and otherwise act to avoid damage to utilities. At the completion of the work, the condition of all utilities shall be equivalent to their use and function prior to construction. Please see Section 1.5.2 - Utility Status Report of this project scope document for additional information.

1.4.5 Emergency Procedures

The contractor shall provide emergency procedures with respect to utility adjustment work. The contractor shall obtain emergency contact information from, and establish emergency procedures with each utility owner.

1.4.6 Utility Adjustment Field Modifications

The contractor shall establish a procedure to be followed if a utility adjustment field modification is proposed by either the contractor or a utility owner, after the utility agreement (which includes the utility adjustment plans) has been approved. The procedure shall contain, at minimum, the following processes:

- A. The utility owner's review and approval of a utility adjustment field modification proposed by the contractor, or the contractor's review and approval of a utility adjustment field modification proposed by the utility owner;
- B. Submittal of plans for the proposed utility adjustment field modification to KYTC for its approval;
- C. Transmittal of utility adjustment field modifications to the appropriate construction field personnel;
- D. Inclusion of any utility adjustment field modifications in the record drawings for the project.

The contractor shall cause the procedure to be followed for all utility adjustment field modifications, whether the construction is performed by the CONTRACTOR or by the utility owner.

1.4.7 Switchover to New Facilities

After a newly adjusted utility has been accepted by the utility owner and is otherwise ready to be placed in service, the contractor shall coordinate with the utility owner regarding the procedure and timing for placing the newly adjusted utility into service and terminating service of the utility being replaced.

1.4.8 Record Drawings

The contractor shall provide record drawings to each utility owner for utilities adjusted by the contractor, in accordance with the applicable utility agreement(s).

The contractor shall provide as built record drawings to KYTC (regardless of whether design and/or construction of the subject utilities was furnished or performed by the contractor or by the utility owner). These drawings shall show the location of, and label as such, all abandoned utilities, shall show and label all other utilities, whether remaining in place or relocated, located within the project right-of-way or otherwise impacted by the project. The contractor shall provide the record drawings for each adjustment to KYTC not later than 90 Days after the utility owner accepts the adjustment.

1.4.9 Maintenance of Utility Service

All utilities shall remain fully operational during all phases of construction, except as specifically allowed and approved in writing by the utility owner. The contractor shall schedule utility adjustment work in order to minimize any interruption of service, while at the same time meeting the project schedule and taking into consideration seasonal demands.

1.4.10 Traffic Control

The contractor shall be responsible for the coordination of all traffic control made necessary by the utility adjustment work, whether performed by the contractor or by the utility owner. Traffic control for utility adjustments shall be coordinated with, and subject to approval by, the local agency(ies) with jurisdiction. Traffic control shall comply with the guidelines of the MUTCD. Delegation of responsibilities regarding who performs the traffic control operations during the utility adjustment work shall be included in the utility agreement. The contractor shall include this work in the traffic management plan prepared for the project.

1.5 DELIVERABLES

The contractor shall provide all submittals described in this section to meet the project schedule, taking into account KYTC designated review and response time. For this project, KYTC requires ten (10) business days for review, comment, or approval of encroachment permits, provided that all required documentation is included with the *Encroachment Permit* submittal. KYTC will not allow time extensions on this review time. At the sole discretion of KYTC, if it is determined that additional information is required in order to review and process the *Encroachment Permit* for approval, the contractor shall revise the encroachment permit application to include the required revisions or missing information as identified by KYTC, and said agency shall have ten (10) business days from the date of re-submittal for review and comment. All deliverables shall conform to the standards required in the project management plan and this section.

1.5.1 Contractor's Utility Tracking Report and Project Coordination Requirements

The contractor shall maintain a utility tracking report in tabular form, listing all utilities located within the project right-of-way or otherwise potentially affected by the project. The utility tracking report shall include sufficient information regarding all factors needed to reasonably determine the status of each utility to be relocated as part of the project. The contractor shall submit the utility tracking report to KYTC and update it monthly. The contractor shall facilitate, at a minimum, quarterly utility company status meetings to discuss any project issues and to update KYTC on the progress being made on the project.

1.5.2 Utility Status Report

The following information has been gathered by KYTC regarding utility impacts as part of the preparation of the modified alternative plans for the project. KYTC is not responsible for the accuracy of this information. It is the contractor's responsibility to verify actual impacts to utilities for the project and to accommodate all costs and work to be done as part of the project schedule prepared for the project. The contractor is responsible for coordination of utility relocations to the satisfaction of KYTC and the utility companies.

1.5.2.1 Utility Companies

The status of utility companies and organizations potentially involved with the work to be performed, as known at the time this RFP was prepared, are described below. Please see Table 1-1 for contact information.

LG&E (Electric Transmission)

There are significant overhead and underground transmission facilities (Paddys Run – T.V.A. 161 kV (tower line) and Shepherdsville – Conestoga 69 kV (pole line)) around the intersection of Conestoga Parkway within the limits of the proposed project. Through a Keep Cost Agreement with KYTC, LG&E relocated the electric transmission lines. Equipment clearances / work clearances from the transmission lines must be adhered to in accordance with LG&E requirements and industry protection guidelines. Contractor must schedule a pre-construction meeting with LG&E to review the proposed work in the vicinity of the transmission facilities, the required clearances and the safety plan. LG&E may require an inspector on-site when working around transmission facilities.

LG&E (Electric Distribution)

There are overhead and underground distribution electric facilities in the project area. LG&E shall perform the design and hire a company approved contractor to perform any relocation construction needed for the project. The contractor shall be responsible for coordinating with LG&E on electrical facility relocations and reimbursing LG&E for the work associated with the relocation. Plans provided are for "Information Purposes Only". The extent of distribution electric facility relocations is pending final plans provided by LG&E.

LG&E and KYTC have an Engineering Services Agreement which covers the engineering and design of the LG&E Electric Distribution facilities. The Contractor shall enter an agreement with LG&E using the

standard agreement Commonwealth of Kentucky Transportation Cabinet Utility Relocation Keep Cost Agreement Pursuant to KRS 179.265 Work by Cabinet's Highway Contractor.

LG&E (Gas)

There are several gas mains in the limits of the proposed project area. LG&E shall perform the design and hire a LG&E approved contractor to perform any relocation construction needed for the project. The contractor shall be responsible for reimbursing LG&E for cost associated with the relocation, including fair and reasonable in-house design services. Plans provided are for "Information Purposes Only". The extent of distribution gas facility relocations is pending final plans by LG&E.

KYTC and LG&E have an existing agreement to reimburse LG&E – Gas for \$100,000 of the gas relocation materials; therefore, the contractor will not be responsible for reimbursing LG&E – Gas for the materials related to this KYTC and LG&E agreement.

LG&E and KYTC have an Engineering Services Agreement which covers the engineering and design of the LG&E Gas facilities. The Contractor shall enter an agreement with LG&E using the standard agreement Commonwealth of Kentucky Transportation Cabinet Utility Relocation Keep Cost Agreement Pursuant to KRS 179.265 Work by Cabinet's Highway Contractor.

City of Shepherdsville Sewer

The City of Shepherdsville Sewer has sewer facilities in the project limits. Approximately 105 m of 200 mm (8-inch) sanitary sewer shall be upsized to a approximately 102 m of 380 mm (15-inch) sanitary sewer. The contractor shall be responsible for construction of the relocation. These plans can be found in Section 1 on sheets U43 through U44 .

KYTC and the City of Shepherdsville have a Keep Cost Betterment Agreement Pursuant to KRS 177.035 Work by Cabinet's Highway Contractor Compensable to the Cabinet.

Louisville Water Company

Several Louisville Water Company (LWC) distribution water mains (8"-16") are located within the project limits and some are expected to be in conflict with the proposed project, and LWC has approximately 3,195 m of proposed 610 mm (24-inch) transmission main in the project area of Section 1. These plans can be found in Section 1 on sheets U1 through U42 and in Section 2 on sheets U1 through U9.

The contractor shall be responsible for construction of the relocations and proposed transmission main. LWC requires the relocation construction by a LWC pre-qualified contractor, in accordance with LWC specifications. The LWC requires one week notice prior to the start of relocation construction to assign an inspector.

KYTC and LWC have a Keep Cost Relocation Agreement with Betterment Pursuant to KRS 177.035 Work by Cabinet's Highway Contractor Compensable to the Cabinet for the relocation of the distribution and installation of the transmission water main work.

TIME WARNER CABLE

Time Warner Cable does have aerial and buried facilities within the project limits and may be in conflict with the proposed project. Time Warner shall perform the design and hire a company approved contractor to perform any relocation construction needed for the project. The contractor shall be responsible for coordinating with Time Warner on communication facility relocations and reimbursing Time Warner for the work associated with the relocation. Utility plans provided are for "Information Purposes Only". The extent of communication facility relocations is pending final construction plans provided by the Time Warner.

Time Warner and KYTC have an Engineering Services Agreement which covers the engineering and design of the Time Warner facilities. The Contractor shall enter an agreement with Time Warner using the standard agreement Commonwealth of Kentucky Transportation Cabinet Utility Relocation Keep Cost Agreement Pursuant to KRS 179.265 Work by Cabinet's Highway Contractor.

WINDSTREAM

Windstream does have aerial and buried facilities in the project limits that may be in conflict with construction. Windstream shall perform the design and hire a company approved contractor to perform most of the relocation construction needed for the project. The contractor shall be responsible for coordinating with Windstream on communication facility relocations and reimbursing Windstream for the work associated with the relocation. Some Windstream buried facilities exceed the extent of the Windstream contractors abilities. This work shall be provided by the contractor in Section 1 on sheets U45 through U46. Utility plans provided are for "Information Purposes Only". The extent of communication facility relocations is pending final construction plans provided by the Windstream.

Windstream and KYTC have an Engineering Services Agreement which covers the engineering and design of the Windstream facilities. The Contractor shall enter an agreement with Windstream using the standard agreement Commonwealth of Kentucky Transportation Cabinet Utility Relocation Keep Cost Agreement Pursuant to KRS 179.265 Work by Cabinet's Highway Contractor.

Bullitt County School Board

Bullitt County School (BCS) does have fiber optic cables in the project limits that may be in conflict with construction. BCS shall perform the design and hire a company approved contractor to perform any relocation construction needed for the project. The CONTRACTOR shall be responsible for coordinating with BCS on communication facility relocations and reimbursing BCS for the work associated with the relocation. Utility plans provided are for "Information Purposes Only". The extent of communication facility relocations is pending final construction plans provided by the BCS.

The Contractor shall enter an agreement with the Bullitt County School Board using the standard agreement Commonwealth of Kentucky Transportation Cabinet Utility Fully Reimbursable Keep Cost Agreement Pursuant to KRS 177.035 (3) to (6). The agreement shall include costs for engineering and relocation services.

Table 1-1 – Utility Companies

UTILITY COMPANIES				
UTILITY	CONTA CT	MAILING ADDRESS	PHONE	EMAIL ADDRESS
Louisville Gas and Electric	Greg Geiser	820 West Broadway, P.O. Box 32020, Louisville, KY 40232-2020	502-627-3708	Greg.Geiser@lge-ku.com
Louisville Water Company	Daniel Tegene	550 South Third Street, Louisville, KY 40202	502-569-3649	dtegene@lwcky.com
Time Warner Communications	Deno Barbour	10168 Linn Station Road, Suite 120 Louisville, KY 40223	502-357-4376 Cell/502-664-7395	Dwight.Barbour@TWCable.com
Windstream Kentucky, Inc.	Roger Redford	229 Lees Valley Road Shepherdsville, KY 40165	502-957-7127/270-723-7549	Roger.Redford@Windstream.com
Bullitt County Schools	Jim Jackson	1044 Highway 44 East Shepherdsville, KY 40165	502-543-2271 Ext. 244	Jim.Jackson@Bullitt.kyschools.us
City of Shepherdsville Sewer	Scott Fleming	634 Conestoga Parkway Shepherdsville, KY 40165	502-664-6254	sfleming@shepcity.com

**KY 61 WIDENING PROJECT IN BULLITT COUNTY
BETWEEN KY 44 & NORTHVIEW DRIVE
M.P. 14.5 to 16.7
ITEM # 5-117.10
PUBLIC INFORMATION PLAN**

The primary goal of the Public Information Plan (PIP) is to inform the motoring public and area stakeholders of project information including Maintenance of Traffic (MOT) which includes temporary widening, lane shifts, temporary diversions & median crossovers, and lane closures. The KYTC District 5 Public Information Officer (PIO) will coordinate and disseminate to stakeholders and the media appropriate information regarding the construction plans.

LOCAL STAKEHOLDERS

- Elected Officials
 - State Senator Paul Hornback- (502) 461-9005; paul.hornback@lrc.ky.gov
 - State Representative Russell Webber – (502) 564-8100; Russell.webber@lrc.ky.gov
 - Bullitt County Judge Executive Melanie Roberts – (502) 543-2262; judgeroberts@windstream.net
 - Bullitt County Magistrate District 1 Ruthie Ashbaugh – (502) 543-6873; ruthie.ashbaugh@gmail.com
 - Bullitt County Magistrate District 3 Joe Laswell – (502) 957-2471; joelaswell03@gmail.com

- Local Agencies
 - Dave Greenwell, Bullitt County Sheriff– (502) 543-2514; dgreenwell@bcky.org
 - Bullitt County E-911 Center – (502) 543-7074; fax (502) 955-5562
 - Ida Prather, Bullitt County Schools Transportation Dept. – (502) 869-8031; ida.prather@bullitt.kyschools.us
 - Jim Stivers, Bullitt County Road Department – (502) 543-2510; jimstivers@windstream.net
 - Roy Raines, Hillview Police Dept. – (502) 955-6808; rraines@hillviewpolice.com

- Utility Companies
 - Local utility companies are kept apprised of this project at the monthly utility coordination meetings hosted by District 5

- Neighborhoods and their Mayors
 - Jim Eadens, Mayor of Hillview – (502) 957-5280; mayor@hilviewky.org
 - Gary Hatcher, Mayor of Pioneer Village – (502) 957-4580; cityclerk@cityofpioneervillage.org
 - Bill Broughton, Mayor of Fox Chase – (502) 955-9593; cityoffoxchase@windstream.net
 - Jerry Clark, Mayor of Hebron Estates – (502) 957-3106; ccamac96@insightbb.com

TRUCKING FIRMS AND OUT OF STATE STAKEHOLDERS

Information will be distributed electronically to trucking firms via Rick Taylor at the Department of Vehicle Regulation (502-564-4540; rick.taylor@ky.gov). Information will also be posted on the 511 website (www.511.ky.gov) and on the 511 telephone information system.

PRESENTATIONS

A project description including anticipated schedule will be provided to the media, stakeholders and other emergency service agencies via e-mail prior to construction. Information will be provided to these groups via traffic advisories, press releases, the District 5 website and the weekly District 5 Road Show of Construction and Maintenance Activities.

MEDIA RELATIONS

The District PIO will prepare an initial news release regarding the contract award for the project. The PIO will conduct interviews with the media throughout the project duration to keep the public informed of construction progress. Traffic advisories will be submitted to the media when a change in the MOT occurs. The contractor must provide to the PIO via the Resident Engineer notification of any change in the MOT at least five (5) days prior to the change.

Temporary Traffic Control Plan (see attached Plans)

PHASE 1 – Construction of 2400mm x 900mm R.C.B.C. and temporary & proposed pavement (including N.B. CSX Bridge) necessary for future phasing.

PRECONDITION TO PHASE 1:

Install MOT construction signs for PHASE 1 traffic. Refer to the latest MUTCD typical applications for applicable sign placement and devices:

TA-6, Shoulder Work With Minor Encroachment (PHASE 1A & 1D)

TA-7, Road Closure With A Diversion (PHASE 1B & 1C)

TA-10, Lane Closure On A Two-Lane Road Using Flaggers (PHASE 1D)

Install temporary barrier, crash cushions, barricades, and drums installed as shown on plans.

PHASE 1A

Maintain 3.3m minimum lane in each direction while shifting traffic away from side with temporary widening.

Install temporary pavement widening (Sta. 1+758.57 to Sta. 2+237.49) & guardrail as shown. Install temporary ditches, entrances & pipes where needed.

PHASE 1B

Shift traffic towards newly constructed temporary widening (NB outside EOP 8.25m right of proposed centerline).

Maintain 3.3m wide lane in each direction (3.0m minimum where noted). Install Western half of box culvert.

Construct proposed SB widening up to existing EOP (Sta. 1+810 to Sta. 2+040) along with associated drainage structures and piping. Install temporary pavement in place of proposed SB curb and gutter from Sta. 1+880 to Sta. 2+040. Tie existing 24" storm sewer manhole lt. Sta. 1+866.753 to newly constructed CBI Type A with 4m ~ 600mm temp. pipe. Safeload existing 24" pipe as noted in the plans.

PHASE 1C

Shift traffic onto newly widened SB KY 61 (outside EOP 8.4m left of proposed centerline).

Install remaining half of box culvert. Construct proposed NB pavement (Sta. 1+880 to Sta. 1+900) along with associated drainage structure and piping. Remove temporary guardrail.

PHASE 1D:

Maintain 3.3m minimum lane in each direction while shifting traffic away from side with construction. Utilize flaggers and one lane closure for installation of Diversion "B". Close Frontage Road No. 1 at Conestoga Pkwy.

Local residents on Frontage Road No. 1 shall utilize Approach Road No. 1 for access. Construct proposed KY 61 and Frontage Road No. 1 as shown including associated guardrail, drainage structures, pipe, and ditches. Install temporary pavement (Diversions, Access Road, and Crossovers) as shown including temporary drainage, guardrail, barrier, crash cushions, & barricades.

PHASE 2 – Construction of proposed SB KY 61.

PRECONDITION TO PHASE 2:

PHASE 2 can begin after completion of temporary crossovers, proposed NB bridge structure with temporary diversions, and temporary access for Coral Ridge Road.

Install MOT construction signs for PHASE 2 traffic. Refer to the latest MUTCD typical application (TA-7, Road Closure With A Diversion) for applicable sign placement and devices.

Place temporary barrier, crash cushions, barricades, and drums as shown on plans.

PHASE 2A

Sta. 1+000 to 3+280: Shift traffic away from construction (NB outside EOP 8.25m right of proposed centerline).

Maintain 3.3m minimum lane in each direction.

Sta. 3+280 to Sta. 4+200: Shift traffic onto Diversion "A" & "B".

Sta. 4+200 to 4+700: Shift SB KY 61 traffic onto temporary crossover.

Detour Coral Ridge Road traffic onto CRR Access.

Construct proposed SB KY 61 and Approach Roads as shown including associated guardrail, drainage structures, pipe, and ditches. Do not disturb ex. sewer pipes parallel to road between Sta. 1+400 and Sta. 1+867 and CBI & pipes (on Eastern side of road) intercepted by said pipe. Construction should be done in limited section lengths along the urban section to limit disruption to businesses (Approx. 100m).

Construct temporary diversions for Northside Ave. & Pointe Blvd. and temporary access entrances at Sta. 2+920 and Sta. 3+050 to tie proposed SB KY 61 to existing KY 61.

PHASE 2B

Shift Northside Ave. and Pointe Blvd. traffic onto diversions to utilize newly constructed SB KY 61 as a Frontage Road for access onto existing KY 61.

Construct remaining intersections of Northside Ave. and Pointe Blvd.

PHASE 3 – Construction of proposed NB KY 61 & intersection at Conestoga Parkway.

PRECONDITION TO PHASE 3:

PHASE 3 can begin after proposed SB KY 61 is complete to accommodate PHASE 3 traffic.

Install MOT construction signs for PHASE 3 traffic. Refer to the latest MUTCD typical application (TA-7, Road Closure With A Diversion) for applicable sign placement and devices. Refer to the latest MUTCD typical application (TA-10, Lane Closure On A Two-Lane Road Using Flaggers) for applicable sign placement and devices for Coral Ridge Road.

Place temporary barrier, crash cushions, barricades, and drums as shown on plans.

PHASE 3 TRAFFIC

Sta. 1+000 to 3+280: Shift traffic away from construction (SB outside EOP 8.25m right of proposed centerline). Maintain 3.3m minimum lane in each direction.

Sta. 3+280 to Sta. 4+200: Shift traffic onto proposed SB KY 61.

Sta. 4+200 to 4+700: Shift NB KY 61 traffic onto temporary crossover.

Utilize one lane closures for Coral Ridge Road.

Detour Conestoga Pkwy. traffic to exit at Adam Shepherd Pkwy.

PHASE 3 CONSTRUCTION

Construct proposed NB KY 61 and Approach Roads as shown including associated guardrail, drainage structures, pipe, and ditches. Remove temporary diversions.

Cap and safeload existing manholes and safeload existing pipes between Sta. 1+400 and Sta. 1+867 as labeled on plan sheets.

PHASE 4 – Construction of final surface course.

PRECONDITION TO PHASE 4:

PHASE 4 can begin after completion of PHASE 3.

Signing to remain the same as in PHASE 3 before shifting traffic onto proposed intended lanes.

PHASE 4

Construct final surface course of NB KY 61 while traffic is utilizing SB KY 61 as in PHASE 3.

Install striping and pavement markings. Open Northbound lanes as design fully intended and build remaining final surface of Southbound lanes utilizing one lane closures. Install striping and pavement markings. Build final surface for all other roadways utilizing one lane closures. Refer to the latest MUTCD typical application (TA-33, Stationary Lane Closure on a Divided Highway & TA-10, Lane Closure On A Two-Lane Road Using Flaggers) for applicable sign placement and devices.

**KY 61 WIDENING PROJECT IN BULLITT COUNTY
BETWEEN BROOKS RUN BRIDGE & CONESTOGA PARKWAY
M.P. 16.4 to 17.9
ITEM # 5-117.20
PUBLIC INFORMATION PLAN**

The primary goal of the Public Information Plan (PIP) is to inform the motoring public and area stakeholders of project information including Maintenance of Traffic (MOT) which includes lane closures and temporary median crossovers. The KYTC District 5 Public Information Officer (PIO) will coordinate and disseminate to stakeholders and the media appropriate information regarding the construction plans.

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Temporary Traffic Control Plan (see attached Plans)

PHASE 1A - Traffic is to remain on existing KY 61.

FRONTAGE RD. NO. 1

Construct proposed Frontage Road No. 1 from Beginning to Sta. 5+100 and tie into existing Frontage Road at Station 5+140 along with labeled drainage ditches.

Construct 21.3m of proposed 1050mm pipe @ Frontage Road No. 1 Sta. 4+970 with a temporary MES Headwall Type 3.

Construct portions of proposed Frontage Road No. from Sta. 5+500 to Sta. 5+548.311 and Sta. 5+567 to end along with labeled drainage ditches, pipes, & structures.

KY 61 DIVERSION

Construct temporary KY 61 Diversion along with labeled temporary drainage ditches, pipes, & structures. Work at the edges of existing northbound KY 61 shall be performed after 7:00 pm in one night by closing the existing southbound lane using flaggers. Refer to the latest MUTCD typical application (TA-10, Lane Closure On Two-Lane Road Using Flaggers) for applicable sign placement and devices.

KY 61 & APPROACH RD. NO. 1

Construct northbound section of KY 61 (along with east side of Approach Rd. No. 1) from Sta. 4+330 to Sta. 4+753.331 along with labeled drainage ditches, pipes, & structures. Build 43m of proposed 2400mm x 1000mm Box Culvert.

Tie northbound KY 61 into existing KY 61 with temporary pavement and build 11m wide temporary entrance from existing KY 61 to proposed KY 61 at Sta. 4+754.

Construct southbound section of KY 61 from Sta. 4+900 to Sta. 5+300 along with labeled drainage ditches, pipes, & structures. Utilize Rolling Roadblock on I-65 to set the beams during bridge construction. Utilize general notes and procedures on Rolling Roadblock For Traffic Control from the KYTC Division of Maintenance Permits Branch.

Construct KY 61 from Sta. 5+420 to Sta. 5+800 along with labeled drainage ditches, pipes, & structures.

APPROACH ROAD NO. 2

Construct proposed Approach Road No. 2 from Sta. 4+830 to existing KY 61 along with labeled drainage ditches, pipes, & structures.

MISCELLANEOUS

Construct access drive off Conestoga Parkway.

Construct temporary Becnel Lane Diversion along with temporary drainage pipe.

Widen driveway of Parcel 127 on south side to 6 meters and connect to Parcel 126 for access.

Construct temporary Hillbrook Diversion at KY 61 Sta. 6+170 along with temporary drainage pipe.

Construct temporary median crossovers at locations shown on existing Section 3 Connector.

PHASE 1B – All traffic is to utilize newly constructed KY 61 Diversion to access existing KY 61.
Southbound traffic is to utilize newly constructed KY 61 S.B. Median Crossover to access

existing KY 61 thru the end of Phase 2. See standard drawing TCC-145, Median Crossover Case II for all applicable signing and spacing.

KY 61 CONNECTOR

Construct KY 61 Connector from Beginning to 4+330 along with labeled drainage ditches, pipes, & structures.

FRONTAGE ROAD NO. 1

Construct portions of proposed Frontage Road No. 1 at Sta. 5+500 and Sta. 5+560 along with labeled drainage ditches, pipes, & structures.

Local traffic (Parcels 103 and 104, & 105) on Frontage Road No.1 shall utilize newly constructed entrance at Sta. 4+960 for access.

APPROACH ROAD NO. 2

Construct remaining portion of Approach Road No. 2 along with labeled drainage ditches, pipes, & structures. Once constructed allow local traffic to use newly constructed intersection to access existing KY 61.

KY 61 & HILLBROOK DRIVE

Construct southbound section of KY 61 from Sta. 5+300 to Sta. 5+420 along with labeled drainage ditches, pipes, & structures (After Approach Road No. 2 is completed and local traffic can utilize it.)

Construct proposed KY 61 from Sta. 6+200 to Sta. 6+300 along with proposed Hillbrook Subdivision entrance, labeled drainage ditches, pipes, & structures.

Construct temporary pavement at existing Hillbrook Drive to temporarily connect to proposed KY 61.

Construct proposed KY 61 southbound lanes from Sta. 6+300 to Sta. 6+560 along with labeled drainage ditches, pipes, & structures.

Construct proposed KY 61 northbound lanes from Sta. 6+300 to Sta. 6+340 along with labeled drainage ditches, pipes, & structures.

BECNEL LANE

Divert local Becnel Lane traffic onto Becnel Diversion. Parcel 126 shall utilize newly widened driveway from existing KY 61 for access.

Construct Becnel Lane and Frontage Road No. 2 along with labeled drainage ditches, pipes, & structures.

PHASE 2A – Direct existing KY 61 traffic to proposed northbound lanes of the newly constructed KY 61 Connector. Traffic will remain on existing KY 61 from Sta. 4+900 to existing Section 3 Connector. As directed in Phase 1B, southbound traffic is to utilize KY 61 S.B. Median Crossover thru the end of Phase 2.

FRONTAGE ROAD NO. 1 & NORTH VIEW DRIVE

Construct proposed North View Drive and Frontage Rd. No. 1 from Sta. 5+391 to Sta. 5+485 along with labeled retaining wall, drainage ditches, pipes, & structures. (Local North View Dr. traffic shall utilize southern portion of existing Frontage Rd. No. 1 to reach KY 61.)

KY 61 & APPROACH RD. NO. 1

Construct Approach Rd. No. 1 and KY 61 southbound lanes from Sta. 4+520 to Sta. 4+720 along with labeled drainage ditches, pipes, & structures.

Construct northbound portion of KY 61 from Sta. 5+240 to Sta. 5+420 along with labeled drainage ditches, pipes, & structures.

Construct proposed KY 61 from Sta. 5+800 to Sta. 6+200 along with labeled drainage ditches, pipes, & structures.

MISCELLANEOUS

Remove temporary diversion and temporary drainage structures and construct remaining portion of 900mm pipe and headwall at Frontage Rd. Sta. 4+970 along with labeled drainage ditches.

Open newly constructed Becnel Lane and Frontage Road No. 2 for local traffic and remove temporary diversions.

Open newly constructed Hillbrook Drive and Temporary access for local traffic and remove temporary diversion.

PHASE 2B - KY 61 Traffic is to remain in same pattern as in Phase 2A.

KY 61 CONNECTOR & KY 61

Construct remaining portion of 2400mm x 1000mm Box Culvert.

Construct remaining portion of KY 61 Connector and KY 61 along with retaining wall, labeled drainage ditches, pipes, & structures.

Construct southbound portion of KY 61 from Sta. 4+720 to Sta. 4+900 along with labeled drainage ditches, pipes, & structures.

Construct temporary pavement at Connector and KY 61 for use in Phase 3.

FRONTAGE ROAD NO. 1

Local traffic from North View Dr. and parcels on Frontage Rd, north of the Box Culvert, shall utilize newly constructed Frontage Rd. No. 1 to reach KY 61.

Construct the eastern lane of Proposed Frontage Rd. No. 1 from Sta. 5+100 to Sta. 5+391 along with retaining wall, labeled drainage ditches, pipes, & structures.

PHASE 3 – Direct existing KY 61 traffic to proposed southbound lanes of newly constructed KY 61 Connector and KY 61. Traffic will remain on southbound lanes of the newly constructed KY 61. Northbound traffic is to utilize KY 61 N.B. Median Crossover to access existing Section 3 KY 61. See standard drawing TCC-145, Median Crossover Case II for all applicable signing and spacing.

FRONTAGE ROAD NO. 1

Construct the remaining portion of proposed Frontage Rd. No. 1 from Sta. 5+100 to Sta. 5+391 along with retaining wall, labeled drainage ditches, pipes, & structures.

KY 61

Construct proposed KY 61 northbound lanes from Sta. 4+753.331 to Sta. 5+240 and from Sta. 6+340 to Sta. 6+600 along with labeled drainage ditches, pipes, & structures. Remove temporary median S.B. crossover.

MISCELLANEOUS

Construct proposed Right-in-Right-out Entrance at KY 61 Sta. 5+165.205.

Remove temporary access at Hillbrook Drive.

Remove Existing Section 3 Connector and construct roadway to reconnect existing KY 61 along with labeled drainage ditches, pipes, & structures.

FINAL SURFACE COARSE

After completion of Phase 3, add final surface to KY 61 northbound lanes while traffic is still on southbound lanes. Install striping and pavement markings.

Open northbound lanes as design fully intended and build remaining final surface of southbound lanes utilizing one lane closures. Install striping and pavement markings.

Build final surface for all other roadways utilizing one lane closures. Install striping and pavement markings.

**RECOMMENDATION FOR PICKUP OF ITEMS TO BE INSTALLED
 ON TRAFFIC SIGNALS/LIGHTING**

Item Number: **5-117.10**

County: **BULLIT**

Description: **SIGNALS ALONG KY 61**

Cabinets		
Master code		
2	T-01-0020	Base Mounted 332 Cabinet
2	T-01-0100	170 Contoller
1	T-01-0501	Conflict Monitor, Model 2018
4	T-01-0510	Isolator, Model 242 (for ped detector and railroad)
11	T-01-0600	Loop Detector, Model 222
19	T-01-0700	Load Switches

Signals		
Master code		
22	T-02-0009	Siemens 3 Section Signal
12	T-02-0090	Pedestrian signal housing
6	T-02-0300	LED Module 12" red arrow
8	T-02-0310	LED Module 12" yellow arrow
4	T-02-0320	LED Module 12" green arrow
16	T-02-0330	LED Module 12" red ball
16	T-02-0340	LED Module 12" yellow ball
16	T-02-0350	LED Module 12" green ball
12	T-02-0365	LED Countdown Pedestrian Module

Special items			
Master code			
1	T-02-0400	Video Detection System Camera Detector, SP	# of left turns put here
1	T-02-0401	Camera Mounting System	
2	T-02-0520	Antenna 10 db yagi	
2	T-03-0240	Jumper 60' N-N RG-213	
2	T-02-0650	Pedstl.top mntg.bkt One-way	
1	T-02-0660	Pedstl.top mntg.bkt Two-way	
3	T-02-0670	Pedestal	
8	T-06-0705	Ped Detector Flat Mount FSA Box	
4	T-06-0710	Ped Detector Pole Mount FSA Box	
12	T-06-0730	Ped Button w/o Plunger	
12	T-17-0015	9 X 15 Countdown Ped Sign DBL Sided	

Poles		
Master code		
3	T-04-0020	Steel Strain Pole 30 foot
5	T-04-0030	Steel Strain Pole 32 foot

Electrical Contractor Name _____
 Electrical Contractor Supervisor _____ Contact number for Supervisor _____
 Project Engineer _____ Contact number for Project Engineer _____
 Project Engineer attests that the mentioned contractor is the actual electrical contractor on this project
 Signature of Project Engineer or Designee _____

SPECIAL NOTE FOR PIPELINE INSPECTION

1.0 DESCRIPTION. The Department will perform visual inspections on all pipe on the project. A video inspection will be required on projects having more than 250 linear feet of storm sewer and/or culvert pipe and on routes with an ADT of greater than 1,000 vehicles. Conduct video inspections on all pipe located under the roadway and 50 percent of the remaining pipe not under the roadway. Storm sewer runs and outfall pipes not under the roadway take precedence over rural entrance pipes. Contractors performing this item of work must be prequalified with the Department in the work type J51 (Video Pipe Inspection and Cleaning). Deflection testing shall be completed using a mandrel in accordance with the procedure outlined below or by physical measurement for pipes greater than 36 inches in diameter. Mandrel testing for deflection must be completed prior to the video inspection testing. Unless otherwise noted, Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

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

2.1 INSPECTION FOR DEFECTS AND DISTRESSES

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

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

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

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

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

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

3.0 MANDREL TESTING. Mandrel testing will be used for deflection testing. For use on Corrugated Metal Pipe, High Density Polyethylene Pipe, and Polyvinyl Chloride Pipe,

use a mandrel device with an odd number of legs (9 minimum) having a length not less than the outside diameter of the mandrel. The diameter of the mandrel at any point shall not be less than the diameter specified in Section 3.6. Mandrels can be a fixed size or a variable size.

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

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

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

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

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

3.6 AASHTO Nominal Diameters and Maximum Deflection Limits.

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

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

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

$$\% \text{ Deflection} = [(AASHTO \text{ Nominal Diameter} - D2) / AASHTO \text{ Nominal Diameter}] \times 100\%$$

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

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

4.2 Record and submit all data.

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

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

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

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

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

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

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24814EC	Pipeline Inspection	Linear Foot
10065NS	Pipe Deflection Deduction	Dollars

Special Note for Completion Date & Liquidated Damages

The specified fixed completion date for this contract is November 30, 2018.

Damages of \$21,000 per day or fraction thereof shall be assessed if West Hebron Lane (KY 1450) is closed for longer than 60 consecutive days.

The following disincentives of \$500 per lane closure per hour or fraction thereof shall be assessed if both lanes of KY 61 are not open except for the permitted hours as defined as hours under “Lane Closures” note in the Maintenance of Traffic General Notes. The \$500 per lane closure per hour disincentive also will be assessed for any single lane closure not specifically permitted in the Traffic Control Plan.

Contrary to the KYTC Standard Specifications Section 108.09, liquidated damages will be assessed regardless of whether seasonal limitations prohibit the contractor from performing work on the controlling operation.

All liquidated damages will be applied accumulatively.

All other applicable portions of KYTC Standard Specification section 108 apply.

Special Note for Bridge Demolition, Renovation and Asbestos Abatement

If the project includes any bridge demolition or renovation, the successful bidder is required to notify Kentucky Division for Air Quality (KDAQ) via filing of form (DEP 7036) a minimum of 10 days prior to commencement of any bridge demolition or renovation work.

Any available information regarding possible asbestos containing materials (ACM) on or within bridges to be affected by the project has been included in the bid documents. These are to be included with the Contractor's notification filed with the KDAQ. If not included in the bid documents, the Department will provide that information to the successful bidder for inclusion in the KDAQ notice as soon as possible. If there are no documents stating otherwise, the bidders should assume there are no asbestos containing materials that will in any way affect the work.



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov/

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

Memorandum

To: Robert Hoagland
CC: David Steele
From: O'Dail Lawson
Environmental Scientist II
Division of Environmental Analysis
Date: 9/12/2014
Re: Asbestos Inspection Report for Bullitt 5-117.10

This report is prepared to accompany the 10-Day NOI for Demolition to the Division of Air Quality. Please include all pages with submittal.

Project and Structure Information

Project # 5-117.10

Bridge # 015B00001N

Description: The concrete samples collected were negative for asbestos. No abatement necessary.

Inspection Date: September 9, 2014

Results

The results revealed that there is no ACM abatement required at this time.



<i>MRS, INC.</i>	<i>MRS, Inc. Analytical Laboratory Division</i>
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332 West Broadway, Suite 613
Louisville, Kentucky 40202

(502) 495-1212
Fax: (502) 491-7111

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N #	2109105 A	Address:	015B00001N
Client Name:	KYTC		Item # 5-117.10 US 61 Over CSX
Sampled By:	O'Dail Lawson		

				% FIBROUS ASBESTOS				% NON-ASBESTOS FIBERS			
Number	Color	Layered	Fibrous	Chrysotile	Amosite	crocidolite	Others	Cellulose	Fiberglass	Syn. Fiber	Other/Mat.
B-1	Gray	Yes	No				None				100%
B-2	Gray	Yes	No				None				100%

Methodology : EPA Method 600/R-93-116
 Date Analyzed : 10-Sep-14
 Analyst : Winterford Mensah

Reviewed By: *Winterford Mensah*
Signature

The test relates only to the items tested. This report does not represent endorsement by NVLAP or any agency of the U.S Government. Partial Reproduction of any part of this report is strictly prohibited. Samples shall be retained for (30) days.



Chain of Custody Record

Kentucky Transportation Cabinet

200 Mero Street, 5th Floor West
Frankfort, Kentucky 40622
(502) 564-7250 fax (502) 564-5655

O'Dail Lawson odail.lawson@ky.gov
KYTC
Address: 200 Mero Street
Frankfort KY
Phone: 502-782-5020 Fax: 502-564-5655
PO#:

Client Information KY TRANSPORTATION CABINET

Results Code: unknown structure ID. Located on US61
over CSX RR @ Water Tower Road.
IO# 015B0001N

Samplers (signature): *[Signature]*

Project or Subject Reference 5-117.10 us61 over CSX

Sample ID	Sample Description	Collected		Analysis Requested	Matrix	Color	Cont. Type	Preservative
		Date	Time					
B-1	Curbs Concrete	9-9-14	13:05	Asbestos/ bulk	Concrete	Grey		N/A
B-2	Rail Concrete	↓	↓	↓	↓	↓		

Relinquished By: _____ Date/Time: _____

Received By: *[Signature]* Date/Time: 09/09/14 1:430

Relinquished By: _____ Date/Time: _____

Received at Lab By: _____ Date/Time: _____

The EI Group, Inc.

This certifies that

Tilmon O'Dail Lawson

Student Address: 132 Old Fort Drive, Georgetown, Kentucky 40324

Has attended and satisfactorily passed an examination covering the contents of an EPA/AHERA approved course entitled

Asbestos Inspector Refresher (4-Hour) Training Course

7214080013
Certificate Number

7910
Social Security Number

August 15, 2014
Course Dates

August 15, 2014
Exam Date

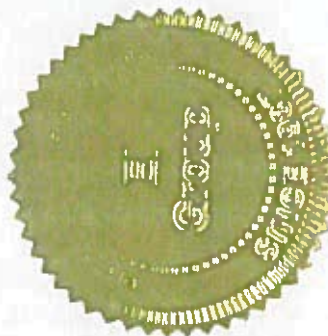
August 15, 2015
Expiration Date

Louisville, KY
Course Location

Barry A. Maxwell
Barry Maxwell, Training Manager

Kerri Boddy
Kerri Boddy, Principal Instructor

Kerri Boddy
Kerri Boddy, Exam Administrator



3240 Office Pointe Place, Suite 102
Louisville, KY 40220
888-372-5859



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

Memorandum

To: Robert Hoagland
CC: David Steele
From: O'Dail Lawson
Environmental Scientist II
Division of Environmental Analysis
Date: 9/12/2014
Re: Asbestos Inspection Report for Bullitt 5-117.20

This report is prepared to accompany the 10-Day NOI for Demolition to the Division of Air Quality. Please include all pages with submittal.

Project and Structure Information

Project # 5-117.20

Bridge # 015B00003N

Description: The concrete samples collected were negative for asbestos. No abatement necessary.

Inspection Date: September 9, 2014

Results

The results revealed that there is no ACM abatement required at this time.



MRS, INC. *MRS, Inc. Analytical Laboratory Division*

332 West Broadway, Suite 613
Louisville, Kentucky 40202

(502) 495-1212
Fax: (502) 491-7111

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N # 2109102 Address: Bullitt County
 Client Name: KYTC Item # 5-117.20 015B00003N
 Sampled By: O'Dail Lawson

Number	Color	Layered	Fibrous	% FIBROUS ASBESTOS				% NON-ASBESTOS FIBERS			
				Chrysotile	Amosite	crocidolite	Others	Cellulose	Fiberglass	Syn. Fiber	Other/Mat.
# 3 - 1	Gray	Yes	No				None				100%

Methodology : EPA Method 600/R-93-116
 Date Analyzed : 10-Sep-14
 Analyst : Winterford Mensah

Reviewed By: *Winterford Mensah*
Signature

The test relates only to the items tested. This report does not represent endorsement by NVLAP or any agency of the U.S Government. Partial Reproduction of any part of this report is strictly prohibited. Samples shall be retained for (30) days.

The EI Group, Inc.

This certifies that

Tilmon O'Dail Lawson

Student Address: 132 Old Fort Drive, Georgetown, Kentucky 40324

Has attended and satisfactorily passed an examination covering the contents of an EPA/AHERA approved course entitled

Asbestos Inspector Refresher (4-Hour) Training Course

7214080013
Certificate Number

7910
Social Security Number

August 15, 2014
Course Dates

August 15, 2014
Exam Date

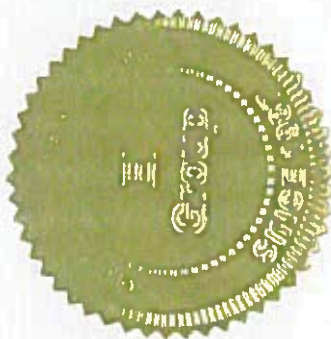
August 15, 2015
Expiration Date

Louisville, KY
Course Location

Barry A. Maxwell
Barry Maxwell, Training Manager

Kerri Boddy
Kerri Boddy, Principal Instructor

Kerri Boddy
Kerri Boddy, Exam Administrator



3240 Office Pointe Place, Suite 102
Louisville, KY 40220
888-372-5859



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov/

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

Memorandum

To: Robert Hoagland
CC: David Steele
From: O'Dail Lawson
Environmental Scientist II
Division of Environmental Analysis
Date: 9/12/2014
Re: Asbestos Inspection Report for Bullitt 5-117.20

This report is prepared to accompany the 10-Day NOI for Demolition to the Division of Air Quality. Please include all pages with submittal.

Project and Structure Information

Project # 5-117.20

Bridge # 015B00078N

Description: The concrete samples collected were negative for asbestos. The joint compound was point counted below 1%. No abatement necessary.

Inspection Date: September 9, 2014

Results

The results revealed that there is no ACM abatement required at this time.



MRS, INC. *MRS, Inc. Analytical Laboratory Division*

332 West Broadway, Suite 613
Louisville, Kentucky 40202

(502) 495-1212
Fax: (502) 491-7111

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N # 2109104 A Address: Bullitt County
Client Name: KYTC Item # 5-117.20 015B00078N
Sampled By: O'Dail Lawson

Number	Color	Layered	Fibrous	% FIBROUS ASBESTOS				% NON-ASBESTOS FIBERS			
				Chrysotile	Amosite	crocidolite	Others	Cellulose	Fiberglass	Syn. Fiber	Other/Mat.
78-1	Black	Yes	No				None				100%
78-2	Black	Yes	No	3%	(To Be	Point Counted)		2%			95%
78-3	Gray	Yes	No				None				100%
78-4	Gray	Yes	No				None				100%

Methodology : EPA Method 600/R-93-116
Date Analyzed : 10-Sep-14
Analyst : Winterford Mensah

Reviewed By: *Winterford Mensah*
Signature

The test relates only to the items tested. This report does not represent endorsement by NVLAP or any agency of the U.S Government. Partial Reproduction of any part of this report is strictly prohibited. Samples shall be retained for (30) days.

AIHA # 102459

AJHA #1 02459

MRS, INC. *MRS, Inc. Analytical Laboratory Division*

332 West Broadway, Suite 613
Louisville, Kentucky 40202

(502) 495-1212
Fax: (502) 491-7111

Client:	<u>KY Transportation Cabinet</u>	Project No:	<u>2109104 B</u>
Address:	<u>200 Mero Street</u>	Sample ID:	<u># 78 - 2</u>
	<u>Frankfort, KY</u>	Sampled:	<u>9-Sep-14</u>
	<u>40601</u>	Received:	<u>9-Sep-14</u>
	<u>Attention O'Dail Lawson</u>	Analyzed:	<u>10-Sep-14 - Point Count -</u>

Bulk Sample Analysis

Sampled by: O'Dail Lawson

Facility/Location: Bullitt County - 5-117.20 015 B00078N

Field Description: Joint Compound - Tar -


Laboratory Description:
Thick Black Material

Asbestos Materials:
Chrysotile - 2/400 = 0.50 % (< 1 %) Sample Is Negative

Non-asbestos Fibrous Materials & Matrix Materials:

<u>Cellulose</u>	<u>0.25 %</u>
<u>Binders</u>	<u>99.25 %</u>

Remarks: The sample was analyzed for asbestos content following the EPA Methodology (600/R-93/116). The test relates only to the items tested. This report does not represent endorsement by NVLAP or any agency of the U.S. Government.

Analyst: Winterford Mensah **Reviewed By:** 
Signature

Chain of Custody Record

Kentucky Transportation Cabinet

200 Mero Street, 5th Floor West
Frankfort, Kentucky 40622
(502) 564-7250 fax (502) 564-5655



O'Dail Lawson odail.lawson@ky.gov KYTC 200 Mero Street Frankfort KY Phone: 502-782-5020 Fax: 502-564-5655 PO#:		Client Information KY TRANSPORTATION CABINET Results Code: ND = None Detected FTD = Filter Tampering or Damaged N/A = Not Applicable		Project or Subject Reference Bullitt 5-117.20 015B00078N		Samplers (signature) 		
Sample ID	Sample Description	Collected		Analysis Requested	Matrix	Color	Cont. Type	Preservative
		Date	Time					
78-1	Joint Compounds	9-9-14	12:55	Asbestos bulk (slide plate) <i>NE END</i>	Rubber	Black		N/A
78-2	Joint Compounds			OUTSIDE Abutment	TAR			
78-3	Wall Concrete				Concrete	Grey		
78-4	Concrete Sealant				Paint			

Relinquished By:	Date/Time:
Received By: <i>Mrs. Stephanie Meadows</i>	Date/Time: <i>09/22/14 14:30</i>
Relinquished By:	Date/Time:
Received at Lab By:	Date/Time:

The EI Group, Inc.

This certifies that
Tilmon O'Dail Lawson

Student Address: 132 Old Fort Drive, Georgetown, Kentucky 40324

Has attended and satisfactorily passed an examination covering the contents of an EPA/AHERA approved course entitled

Asbestos Inspector Refresher (4-Hour) Training Course

7214080013
Certificate Number

7910
Social Security Number

August 15, 2014
Course Dates

August 15, 2014
Exam Date

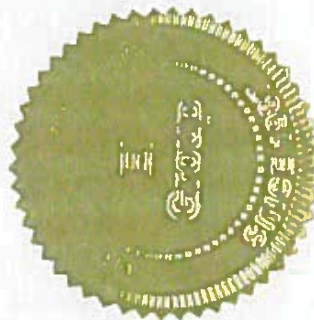
August 15, 2015
Expiration Date

Louisville, KY
Course Location

Barry A. Maxwell
Barry Maxwell, Training Manager

Kerri Boddy
Kerri Boddy, Principal Instructor

Kerri Boddy
Kerri Boddy, Exam Administrator



3240 Office Pointe Place, Suite 102
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KENTUCKY TRANSPORTATION CABINET
Department of Highways
DIVISION OF RIGHT OF WAY & UTILITIES

TC 62-226
Rev. 07/2015
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RIGHT OF WAY CERTIFICATION

ITEM #	COUNTY	PROJECT #	FEDERAL PROJECT #
5-117.10	Bullitt	12FO FD52 015 5325101R	OSTPR 05116 019
PROJECT DESCRIPTION Widen KY 61			
<input type="checkbox"/> NO ADDITIONAL RIGHT OF WAY REQUIRED Construction will be within the limits of the existing right of way. The right of way was acquired in accordance with FHWA regulations under the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended. No additional rights of way or relocation assistance were required for this project.			
<input type="checkbox"/> ADDITIONAL RIGHT OF WAY REQUIRED AND CLEARED			
TOTAL NUMBER OF PARCELS ON PROJECT		IMPROVEMENTS	
NUMBER OF PARCELS THAT HAVE BEEN ACQUIRED BY:		<input type="checkbox"/> There were no improvements within the required right of way	
Signed Deed		<input type="checkbox"/> All improvements have been removed from the required right of way	
Condemnation		<input type="checkbox"/> Improvements are currently being removed and it is anticipated that right of way will be cleared prior to the letting date	
Signed Right of Entry Agreement		<input type="checkbox"/> Improvement removal will be included in the construction contract	
RELOCATION ASSISTANCE			
Relocation Assistance was not required for this project	<input type="checkbox"/>		
All parties have been relocated in accordance with FHWA regulations	<input type="checkbox"/>		
<input checked="" type="checkbox"/> ADDITIONAL RIGHT OF WAY REQUIRED WITH EXCEPTION			
TOTAL NUMBER OF PARCELS ON PROJECT		95	
Number of parcels acquired by Deed, Condemnation or Signed Right of Entry Agreement		94	
EXCEPTION(S)	ANTICIPATED DATE OF POSSESSION	IMPROVEMENTS	
77	11/15/2015	<input type="checkbox"/> There were no improvements within the required right of way	
		<input type="checkbox"/> All improvements have been removed from the required right of way	
		<input checked="" type="checkbox"/> Improvements are currently being removed and it is anticipated that right of way will be cleared prior to the letting date	
		<input type="checkbox"/> Improvement removal will be included in the construction contract	
RELOCATION ASSISTANCE			
Relocation assistance was not required for this project			<input type="checkbox"/>
All parties have been relocated in accordance with FHWA regulations			<input checked="" type="checkbox"/>
Notes/Comments: Parcel 77 is CSX Railroad. Waiting on construction agreement.			
LPA		Right of Way Director	
Printed Name		Printed Name	D. Long
Signature		Signature	<i>[Signature]</i>
Date		Date	
Right of Way Supervisor		FHWA	
Printed Name	Travis Thompson	Printed Name	No Signature Required
Signature	<i>[Signature]</i>	Signature	as per FHWA - KYTC
Date	9-23-2015	Date	2015 Stewardship Agreement



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RIGHT OF WAY CERTIFICATION

ITEM #	COUNTY	PROJECT #	FEDERAL PROJECT #
5-117.20	Bullitt	12FO FD52 015 5325101R	OSTPR 05116 019

PROJECT DESCRIPTION Widen KY 61

NO ADDITIONAL RIGHT OF WAY REQUIRED

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

ADDITIONAL RIGHT OF WAY REQUIRED AND CLEARED

TOTAL NUMBER OF PARCELS ON PROJECT	48	IMPROVEMENTS	
NUMBER OF PARCELS THAT HAVE BEEN ACQUIRED BY:		<input type="checkbox"/>	There were no improvements within the required right of way
Signed Deed	44	<input checked="" type="checkbox"/>	All improvements have ben removed from the required right of way
Condemnation	4		
Signed Right of Entry Agreement		<input type="checkbox"/>	Improvements are currently being removed and it is anticipated that right of way will be cleared prior to the letting date
RELOCATION ASSISTANCE		<input type="checkbox"/>	Improvement removal will be included in the construction contract
Relocation Assistance was not required for this project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
All parties have been relocated in accordance with FHWA regulations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

ADDITIONAL RIGHT OF WAY REQUIRED WITH EXCEPTION

EXCEPTION(S)	ANTICIPATED DATE OF POSSESSION	IMPROVEMENTS	
		<input type="checkbox"/>	There were no improvements within the required right of way
		<input type="checkbox"/>	All improvements have been removed from the required right of way
		<input type="checkbox"/>	Improvements are currently being removed and it is anticipated that right of way will be cleared prior to the letting date
		<input type="checkbox"/>	Improvement removal will be included in the construction contract

RELOCATION ASSISTANCE
Relocation assistance was not required for this project
All parties have been relocated in accordance with FHWA regulations

Notes/Comments:

LPA		Right of Way Director	
Printed Name		Printed Name	<i>D. Long</i>
Signature		Signature	<i>[Signature]</i>
Date		Date	24 Sept 15
Right of Way Supervisor		FHWA	
Printed Name	<i>Travis Thompson</i>	Printed Name	
Signature	<i>[Signature]</i>	Signature	
Date		Date	

No Signature Required
as per FHWA - KYTC
2013 Stewardship Agreement

UTILITIES AND RAIL CERTIFICATION NOTE

BULLITT COUNTY
FD04 015 53251 02U
WIDEN KY 61 FROM CONESTOGA PARKWAY
TO SOUTH OF WEST 4TH STREET (KY 44)
ITEM NO. 5-117.10

GENERAL PROJECT NOTE ON UTILITY PROTECTION

Utility coordination efforts determined that there are utilities that will require relocation to accommodate this construction. The information provided below in these Special Notes for Utility Clearance, Impact on Construction may not be exact or complete. The information provided is for the contractor's use in planning the execution of the work. It shall be the road contractor's responsibility to verify the completeness and/or accuracy of all such information being furnished.

NOTE: DO NOT DISTURB THE FOLLOWING UTILITIES LOCATED WITHIN THE PROJECT DISTURB LIMITS

LG&E-Electric, LG&E-Gas, Louisville Water Company, Windstream, Time Warner/Insight, Bullitt County School Board have facilities that require relocation. Please see the notes below pertaining to their relocations.

LG&E-Electric - LG&E Electric has existing overhead facilities throughout the entire project limits. Overhead line run parallel with proposed KY 61 on the east side from Sta. 1+058 Rt. 10 M to Sta. 2+453 Rt. 21 M, from Sta. 2+533 Lt. 4 M to Sta. 2+812 Lt. 10 M and from Sta. 3+327 Lt. 14 to Sta. 3+460 Lt. 10.

Overhead lines cross proposed KY 61 from Sta. 1+098 Rt. 12 M to Sta. 1+086 Lt. 43 M, from Sta. 1+117 Rt. 11 M to Sta. 1+120 Lt. 7 M, from Sta. 1+154 Rt. 10 M to Sta. 1+153 Lt. 11 M, from Sta. 1+170 Rt. 10 M to Sta. 1+148 Lt. 3 M, from Sta. 1+217 Rt. 9 M to Sta. 1+212 Lt. 5 M and to Sta. 1+237 Lt. 7 M.

Overhead facilities run parallel with Cherry Street from KY 61 Sta. 1+237 Lt. 7 M to Cherry Street Sta. 4+927 Lt. 4 M. Overhead facilities cross Cherry Street from Sta. 4+927 Lt. 4 M to Sta. 4+929 Rt. 5 M.

Overhead facilities cross KY 61 from Sta. 1+317 Rt. 9 M running parallel to Blue Lick Road Sta. 4+959 Rt. 9 M. Overhead facilities run parallel to Blue Lick Road from Sta. 4+959 Rt. 9 M to Sta. 4+872 Rt. 6 M. Overhead facilities cross Blue Lick Road from Sta. 4+921 Rt. 6 M to Sta. 4+906 Lt. 8 M and to Sta. 4+908 Lt. 8 M.

Overhead facilities cross KY 61 from Sta. 1+383 Rt. 12 M to Sta. 1+388 Lt. 7 M. Overhead facilities run perpendicular to KY 61 at Sta. 1+353 Rt. 12 M, from Sta. 1+404 Rt. 12 M to Sta. 1+404 Rt. 33 M and from Sta. 1+426 Lt. 6 M to Sta. 1+427 Lt. 20 M. Overhead facilities cross KY 61 from Sta. 1+434 Rt. 12 M to Sta. 1+426 Lt. 6 M, from Sta. 1+462 Rt. 12 M to Sta. 1+465 Lt. 6 M, from Sta. 1+492 Rt. 12 M to Sta. 4+489 Lt. 6 M, from Sta. 1+492 Rt. 12 M to Sta. 1+511 Lt. 6 M, from Sta. 1+533 Rt. 12 M to Sta. 1+511 Lt. 6 M, from Sta. 1+580 Rt. 12 M to 1+620 Lt. 7 M and from Sta. 1+620 Rt. 12 M to Sta. 1+620 Lt. 7 M.

Overhead facilities run perpendicular to KY 61 to the west along Fairgrounds Way at Sta. 1+620 Lt. 7 M.

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Overhead facilities cross KY 61 from Sta. 1+626 Rt. 12 M to Sta. 1+620 Lt. 7 M, from Sta. 1+626 Rt. 12 M to Sta. 1+639 Lt. 14 M, from Sta. 1+676 Rt. 12 M to Sta. 1+665 Lt. 22 M, from Sta. 1+772 Rt. 11 M to Sta. 1+744 Lt. 5 M, from Sta. 1+773 Rt. 11 M to Sta. 1+783 Lt. 48 M, from Sta. 1+808 Rt. 10 to Sta. 1+828 Lt. 7 M, from Sta. 1+904 Rt. 8 M to Sta. 1+893 Lt. 23 M, from Sta. 1+946 Rt. 7 M to Sta. 1+957 Lt. 13 M, and from Sta. 1+946 Rt. 7 M to Sta. 1+958 Lt. 11 M. Overhead facilities run perpendicular to KY 61 at Sta. 1+992 Rt. 6 to the east. Overhead facilities cross KY 61 from Sta. 2+035 Rt. 6 M to Sta. 2+020 Lt. 10 M. Overhead facilities run perpendicular to KY 61 from Sta. 2+020 Lt. 10 M to Sta. 2+029 Lt. 34 M. Overhead facilities cross KY 61 from Sta. 2+128 Rt. 7 M to Sta. 2+110 Lt. 13 M, from Sta. 2+128 Rt. 7 M to Sta. 2+121 Lt. 27 M, from Sta. 2+128 Rt. 7 M to Sta. 2+138 Lt. 10 M, from Sta. 2+173 Rt. 7 M to Sta. 2+138 Lt. 10, from Sta. 2+219 Rt. 12 M to Sta. 2+214 Lt. 22 M, from Sta. 2+264 Rt. 17 M to Sta. 2+218 Lt. 20 M, from Sta. 2+324 centerline to Sta. 2+295 Lt. 41 M, from Sta. 2+347 Rt. 16 M to Sta. 2+346 Rt. 5 M, from Sta. 2+408 Rt. Rt. 19 M to Sta. 2+409 Rt. 9 M, from Sta. 2+454 Rt. 21 M to Sta. 2+437 Lt. 9 M and from Sta. 2+454 Rt. 21 M to Sta. 2+533 Lt. 4 M. Overhead facilities run perpendicular to KY 61 to the east from Sta. 2+633 Lt. 8 M to Sta. 2+265 Lt. 30 M, from Sta. 2+633 Lt. 8 M to Sta. 2+630 Lt. 16 M and from Sta. 2+681 Lt. 9 M. Overhead facilities cross KY 61 from Sta. 3+181 Lt. 3 M to Sta. 3+186 Rt. 13 M. Overhead facilities run perpendicular to KY 61 to the east from Sta. 3+334 Lt. 14 M to Sta. 3+335 Lt. 46 M. Overhead facilities cross KY 61 from Sta. 3+455 Rt. 23 M to Sta. 3+460 Lt. 10 M.

These facilities will be removed or relocated by LG&E or their contactors.

LG&E, Windstream, Bullitt County Schools and Time Warner Cable share some of the same pole routes. The road contractor shall be aware that there are a number of LG&E poles that shall remain or which are expected to be installed prior to the start of the roadway work. Existing poles will be removed once all facilities have been transferred to new poles.

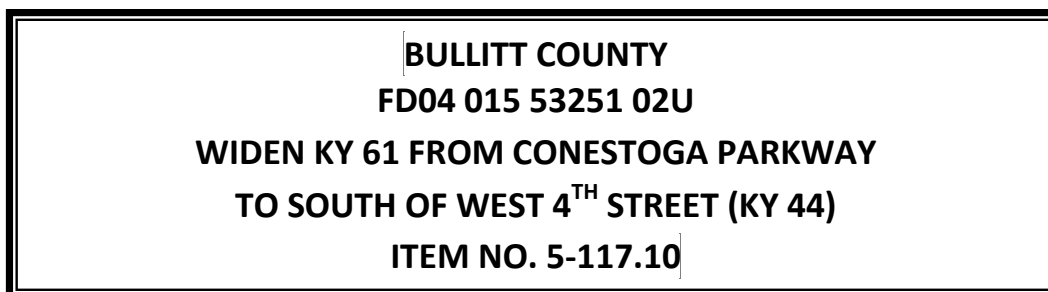
This work is to be coordinated between the Contractor and the Utility.

LG&E-Electric - Existing overhead facilities shall remain in place as described below. Existing overhead facilities running parallel to existing KY 61 from replaced pole at Sta. 1+153 Lt. 12 M to pole to remain at Sta. 1+169 Lt. 13 M. Existing overhead facilities crossing KY 61 from Sta. 3+158 Rt. 25 M to Sta. 3+121 Lt. 34 M to remain at Sta. 3+326 Lt.

These facilities are not to be disturbed and will remain in place.

LG&E-Gas – LG&E Gas has existing underground facilities running throughout the entire project limits. An existing medium pressure steel 8-inch gas line runs along the east side of existing KY 61 from the beginning of the project at Sta. 1+092 Rt. 18 M to Sta. 3+710 Lt. 29 M. An existing medium pressure

UTILITIES AND RAIL CERTIFICATION NOTE



steel 2-inch gas line crosses KY 61 at Sta. 1+238. An existing medium pressure steel 4-inch gas line crosses KY 61 at Sta. 1+344. An existing medium pressure steel 4-inch gas line runs parallel to Blue Lick road from Sta. 4+973 Lt. 2 M to Sta. 4+875 Lt. 6 M. An existing medium pressure plastic 2-inch gas line crosses KY 61 at Sta. 2+645. An existing medium pressure plastic 2-inch gas line crosses KY 61 at Sta. 2+727. An existing medium pressure plastic 4-inch gas line crosses KY 61 at Sta. 3+230 and runs parallel to Pointe Blvd on the south side. An existing medium pressure 8-inch gas line runs parallel to Coral Ridge from KY 61 Sta. 3+71 Lt. 28 M to Coral Ridge Sta. 4+490 Rt. 7 M.

These facilities will be removed or relocated by LG&E or their contactors.

When blasting within vicinity of any gas facility a blasting plan will need to be submitted to LG&E project engineer.

LG&E-Gas - Existing gas lines cross KY 61 at Sta. 1+193, Sta. 1+211 and Sta. 1+224. An existing medium pressure 6-inch gas line crosses KY 61 at Sta. 2+465. An existing 8-inch gas line runs parallel to Coral Ridge from Sta. 4+490 Rt. 7 north.

These facilities are not to be disturbed and will remain in place.

Louisville Water Company - Existing underground facilities shall remain in place as described below. An existing 12-inch water main runs along the east side of KY 61 from Sta. 1+067 Rt. 21 M to Sta. 1+708 Rt. 16 M. An existing 12-inch water main crosses KY 61 from Sta. 1+107 Rt. 15 M to Sta. 1+108 Lt. 4 M. An existing 12-inch water main crosses KY 61 at Sta. 1+376. An existing 12-inch water main runs parallel to KY 61 from Sta. 1+360 Lt. 13 M to Sta. 1+426 Lt. 10 M. An existing 12-inch water main runs parallel to KY 61 from Sta. 1+799 Lt. 10 M to Sta. 2+176 Lt. 11 M. An existing 16-inch water main runs parallel to KY 61 from Sta. 2+617 Lt. 11 M to Sta. 2+731 Lt. 11 M. An existing 16-inch water main runs parallel to KY 61 from Sta. 2+782 Lt. 12 M to Sta. 2+280 Lt. 10 M. An existing 16-inch water main runs parallel to KY 61 from Sta. 2+965 Lt. 10 M to Sta. 3+075 Lt. 10 M. An existing 16-inch water main runs parallel to KY 61 from Sta. 3+184 Lt. 11 M to Sta. 3+541 Lt. 16 M. An existing 16-inch water main runs parallel to Coral Ridge from Sta. 4+789 Lt. 8 M to Sta. 4+785 Lt. 6 M then crosses Coral Ridge from Sta. 4+785 Lt. 6 M to Sta. 4+748 Rt. 6 M running parallel to Coral Ridge from Sta. 4+748 Rt. 6 M to KY 61 Sta. 4+088 Lt. 79 M, crossing Coral Ridge again from Sta. 4+088 Lt. 79 M to Sta. 4+093 Lt. 66 M running parallel to Coral Ridge from Sta. 4+093 Lt. 66 M to CSX crossing from Sta. 4+100 Lt. 68 M to Sta. 4+108 Lt. 36 and crossing KY 61 from Sta. 4+100 Lt. 36 M to Sta. 4+094 Rt. 50 M.

These facilities are not to be disturbed and will remain in place.

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Windstream – Windstream has existing overhead and underground facilities throughout the entire project limits. An existing underground conduit crosses KY 61 at Sta. 1+315 including a large junction vault on the left side of KY 61. An existing underground conduit runs along Blue Lick Road from Sta. 1+315 Lt. 4 M to Sta. 1+327 Lt. 7 M. An existing underground conduit crosses Blue Lick Road from Sta. 4+985 Rt. 18 M to Sta. 4+872 Rt. 6 M. An existing overhead facility crosses KY 61 from Sta. 1+773 Rt. 11 M to Sta. 1+783 Lt. 6 M. An existing overhead facility runs along KY 61 from Sta. 2+454 Rt. 21 M to Sta. 3+455 Rt. 23 M. Existing overhead facilities cross KY 61 from Sta. 2+576 Rt. 15 M to Sta. 2+585 Lt. 6 M, from Sta. 2+804 Rt. 11 M to Sta. 2+812 Lt. 10 M, from Sta. 2+804 Rt. 11 M to Sta. 2+813 Lt. 10 M and Sta. 3+092 Rt. 13 M to Sta. 3+062 Lt. 6 M. An existing overhead facility runs perpendicular to KY 61 from Sta. 3+062 Lt. 6 M to the west. An existing underground facility runs parallel to KY 61 from Sta. 3+181 Lt. 3 M to Sta. 3+216 Lt. 5 M. An existing underground facility runs perpendicular to KY 61 from Sta. 3+216 Lt. 5 M to the west. Existing overhead facilities cross KY 61 from Sta. 3+322 Rt. 13 M to Sta. 3+323 Lt. 1 M on to Sta. 3+334 Lt. 14 M. Existing overhead facilities run parallel to KY 61 from Sta. 3+455 Rt. 23 M to Sta. 3+800 Rt. 20 M. Existing overhead facilities cross KY 61 from Sta. 3+800 Rt. 20 M to Sta. 3+947 Lt. 28 M. Existing overhead facilities run parallel to Coral Ridge Road from KY 61 Sta. 3+947 Lt. 28 M to KY 61 Sta. 4+050 Lt. 56 M. Existing overhead facilities cross Coral Ridge Road from Sta. 4+643 Lt. 8 M to Sta. 4+580 Rt. 11 M. Existing overhead facilities cross Coral Ridge from KY 61 Sta. 4+050 Lt. 56 M to Sta. 4+043 Lt. 64 M. Existing overhead facilities run parallel to Coral Ridge from KY 61 Sta. 3+980 Lt. 39 M to Sta. 4+016 Rt. 1 M. Existing overhead facilities cross KY 61 at Sta. 4+016 Rt. 1 M. Existing overhead facilities run parallel to KY 61 from Sta. 4+003 Rt. 15 M to Sta. 4+128 Lt. 43 M. Existing overhead facilities cross Coral Ridge from KY 61 Sta. 3+980 Lt. 39 M to Coral Ridge Sta. 4+526 Rt. 8 M. Existing overhead facilities run parallel to Access Road No. 1 from KY 61 Sta. 3+989 Rt. 40 M to Sta. 4+060 Rt. 48 M.

These facilities will be removed or relocated by Windstream or their contractors.

Windstream- Windstream has existing overhead and underground facilities shall remain in place as described below. Existing underground facilities run parallel to KY 61 from Sta. 1+004 Rt. 10 M to Sta. 1+383 Rt. 11 M.

These facilities are not to be disturbed and will remain in place.

Bullitt County Schools – Bullitt County Schools has existing overhead facilities from south of the project beginning north through the Blue Lick intersection and northwest on Blue Lick. Overhead facilities run parallel to KY 61 from Sta. 1+058 Rt. 10 M to Sta. 1+317 Rt. 9. Overhead facilities cross KY 61 from Sta. 1+317 Rt. 9 M to Blue Lick Sta. 4+959 Rt. 9 M. Overhead facilities run parallel to Blue Lick Road from Blue Lick Sta. 4+959 Rt. 9 M to 4+872 Rt. 6 M.

These facilities will be removed or relocated by Bullitt County Schools or their contractors.

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LG&E, Windstream, and Time Warner Cable share some of the same pole routes. Existing poles will be removed once all facilities have been transferred to new poles.

This work shall be coordinated by the Contractor.

City of Shepherdsville Sewer – The City of Shepherdsville has existing underground facilities located throughout the project limits. An existing 15-inch sewer crosses KY 61 from Sta. 1+891 Lt. 19 M to Sta. 1+892 Lt. 3 M running parallel to KY 61 from Sta. 1+892 Lt. 3 M to Sta. 2+417 on the centerline. An existing 10-inch sewer crosses KY 61 at Sta. 1+869. An existing 8-inch sewer runs parallel to KY 61 from Sta. 2+027 Rt. 4 M to Sta. 2+173 Rt. 7 M. An existing 8-inch sewer crosses KY 61 at Sta. 2+023. An existing 8-inch sewer crosses KY 61 at Sta. 2+145. An existing 10-inch sewer crosses KY 61 at Sta. 2+518. An existing 8-inch sewer runs parallel to KY 61 from Sta. 2+518 on the centerline to Sta. 2+820 Lt. 6 M.

These facilities are not to be disturbed and will remain in place.

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

THE FOLLOWING COMPANIES ARE RELOCATING/ADJUSTING THEIR UTILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

LG&E – Electric – LG&E-Electric has relocated overhead facilities from Sta. 3+645 Rt. 97 M to Sta. 3+617 Lt. 89 M.

THE FOLLOWING COMPANIES HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE COMPANY OR THE COMPANY'S SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

LG&E-Electric – LG&E – Electric has proposed overhead facilities throughout the entire project limits. An overhead proposed route will run parallel to 61 from Sta. 1+058 Rt. 10 M to Sta. 2+072 Rt. 12 M crossing KY 61 to the west side of KY 61 Sta. 2+110 Lt. 14 M running parallel to KY 61 on the west side from Sta. 2+110 Lt. 14 M to Sta. 2+221 Lt. 20 M, crossing KY 61 to the east side of KY 61 Sta. 2+259 Rt. 13 M and running parallel to KY 61 to Sta. 2+504 Rt. 19 M. Overhead proposed routes will cross KY 61 from Sta. 1+098 Rt. 12 M to Sta. 1+086 Lt. 43 M, from Sta. 1+118 Rt. 12 M to Sta. 1+119 Lt. 12 M, from Sta. 154 Rt. 13 M to Sta. 1+153 Lt. 12 M and Sta. 1+213 Rt. 12 M to Sta. 1+211 Lt. 12 M. An overhead proposed route will run perpendicular to KY 61 from Sta. 1+240 Rt. 12 M to Sta. 1+241 Lt. 19 M. An overhead proposed route will run parallel to Cherry Street from Cherry Street Sta. 4+980 Lt. 5 M to Sta. 4+927 Lt. 4 M and will cross Cherry Street from Sta. 4+927 Lt. 4 M to Sta. 4+929 Rt. 5 M. An overhead proposed route will cross KY 61 from Sta. 1+319 Rt. 12 M to Blue Lick Sta. 4+959 Rt. 10 M. An overhead proposed route will run parallel to Blue Lick Road from Sta. 4+959 Rt. 10 M to Sta. 4+872 Rt. 6 M. Overhead proposed routes will cross Blue Lick from Sta. 4+912 Rt. 7 M to Sta. 4+906 Lt. 8 M and from Sta. 4+912

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Rt. 7 M to Sta. 4+908 Lt. 8 M. An overhead proposed route will run perpendicular to KY 61 from Sta. 3+353 Rt. 12 M. An overhead proposed route will cross KY 61 from Sta. 1+384 Rt. 12 M to Sta. 1+397 Lt. 12 M. An overhead proposed route will run perpendicular to KY 61 from Sta. 1+404 Rt. 12 M to Sta. 1+404 Rt. 33 M. Proposed overhead facilities will cross KY 61 from Sta. 1+430 Rt. 12 M to Sta. 1+428 Lt. 12 M and from Sta. 1+492 Rt. 12 M to Sta. 1+490 Lt. 12 M. An overhead proposed route will run parallel to KY 61 Sta. 1+608 Lt. 14 M to Sta. 1+620 Lt. 15 M. An overhead proposed route will run perpendicular to KY 61 from Sta. 1+620 Lt. 15 M along Fairgrounds Way. Overhead proposed routes will cross KY 61 from Sta. 1+626 Rt. 12 M to Sta. 1+620 Lt. 15 M, from Sta. 1+626 Rt. 12 to Sta. 1+639 Lt. 14 M, from Sta. 1+665 Rt. 12 M to Sta. 1+664 Lt. 22 M, from Sta. 1+741 Rt. 12 M to Sta. 1+741 Lt. 12 M, from Sta. 1+772 Rt. 12 M to Sta. 1+783 Lt. 48 M, from Sta. 1+899 Rt. 12 to Sta. 1+895 Lt. 13 M, from Sta. 1+947 Rt. 12 M to Sta. 1+957 Lt. 13 M and from Sta. 2+037 Rt. 12 to Sta. 2+020 Lt. 12 M. An overhead proposed route will run perpendicular to KY 61 from Sta. 2+020 Lt. 12 M to Sta. 2+029 Lt. 34 M. Overhead proposed routes will cross KY 61 from Sta. 2+125 Rt. 12 M to Sta. 2+110 Lt. 15 M, from Sta. 2+152 Lt. 15 M to Sta. 2+146 Rt. 12 M, from Sta. 2+185 Lt. 15 to Sta. 2+172 Rt. 11 M, and from Sta. 2+219 Lt. 14 M to Sta. 2+221 Rt. 12 M. An overhead proposed route will cross KY 61 from Sta. 2+335 Rt. 16 M to Sta. 2+315 Lt. 12 M. Overhead proposed routes will cross KY 61 from Sta. 2+453 Rt. 21 M to Sta. 2+438 Lt. 12 M and from Sta. 2+504 Rt. 19 M to Sta. 2+530 Lt. 12 M. An overhead proposed route will run parallel to KY 61 from Sta. 2+530 Lt. 12 M to Sta. 2+813 Lt. 13 M. Overhead proposed routes will cross KY 61 from Sta. 2+577 Rt. 16 M to Sta. 2+577 Rt. 12 M, at Sta. 2+635 and at Sta. 2+681. Overhead proposed routes will run perpendicular to KY 61 from Sta. 2+635 Lt. 12 M to Sta. 2+635 Lt. 30 M, from Sta. 2+635 Lt. 12 M to Sta. 2+630 Lt. 16 and from Sta. 2+681 Lt. 8 M. An overhead proposed route will cross KY 61 from Sta. 2+822 Rt. 12 M to Sta. 2+813 Lt. 13 M. An overhead proposed route will run parallel to KY 61 from Sta. 3+334 Lt. 15 M to Sta. 3+460 Lt. 15 M. An overhead proposed route will run perpendicular to KY 61 at Sta. 3+334 Lt. 15 M. An overhead proposed route will cross KY 61 from Sta. 3+455 Rt. 23 M to Sta. 3+460 Lt. 15 M.

LG&E, Windstream, and Time Warner Cable share some of the same pole routes. The road contractor shall be aware that there are a number of LG&E poles that shall remain or which are expected to be installed prior to the start of the roadway work. Existing poles will be removed once all facilities have been transferred to new poles. **The Contractor shall coordinate with the utilities the relocation of these facilities.**

Windstream – Windstream has proposed overhead facilities throughout the entire project limits. Proposed buried facilities will run from Sta. 1+300 Lt. 11 M to Sta. 1+325 Lt. 11 M. Proposed buried

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facilities will run parallel to Blue Lick Road from Sta. 4+981 Rt. 21 M to Sta. 4+872 Rt. 6 M. Proposed buried facilities will run parallel to KY 61 from Sta. 2+577 Lt. 12 M to Sta. 3+460 Lt. 15 M. Proposed buried facilities will run parallel to KY 61 from Sta. 3+272 Lt. 11 M to Sta. 3+272 Lt. 16 M. Proposed buried facilities will run parallel to KY 61 from Sta. 3+272 Lt. 16 M to Sta. 3+236 Lt. 16 M. Proposed buried facilities will run perpendicular to KY 61 from Sta. 3+236 Lt. 16 M. Proposed overhead facilities will run parallel to KY 61 from Sta. 3+455 Rt. 23 M to Sta. 3+730 Rt. 44 M. Proposed overhead facilities will cross KY 61 from Sta. 3+730 Rt. 44 M to Sta. 4+757 Lt. 15 M. Proposed overhead facilities will cross Coral Ridge Road from Sta. 4+757 Lt. 15 M to Sta. 4+752 Rt. 12 M, from Sta. 3+700 Lt. 14 M to Sta. 3+700 Rt. 9 M, from Sta. 3+643 Lt. 8 M to Sta. 3+576 Rt. 22 M and from Sta. 3+576 Rt. 22 M to Sta. 3+466 Lt. 5 M. Proposed overhead facilities will cross Access Road Number 1 from KY 61 Sta. 3+989 Rt. 40 M to Sta. 4+060 Rt. 48 M and from Access Road No. 1 Sta. 3+820 Rt. 9 M to KY 61 Sta. 3+989 Rt. 40 M.

LG&E, Windstream, and Time Warner Cable share some of the same pole routes. The road contractor shall be aware that there are a number of Windstream poles that shall remain or which are expected to be installed prior to the start of the roadway work. Existing poles will be removed once all facilities have been transferred to new poles.

The Contractor shall coordinate this work with the utilities.

LG&E-Gas - LG&E Gas has proposed buried facilities throughout the project area. A proposed 8-inch medium pressure gas main will run parallel to KY 61 from Sta. 1+100 Rt. 11 M to Sta. 3+220 Rt. 12 M, will cross KY 61 at Sta. 3+220 Rt. 12 M to Sta. 3+220 Lt. 11 M and will continue parallel along KY 61 from Sta. 3+220 Lt. 11 M to Sta. 3+600 Lt. 29 M. A proposed 2-inch medium pressure plastic gas main will cross KY 61 from Sta. 1+241 Rt. 12 M to Cherry Street Sta. 4+934 Lt. 4 M. A proposed 4-inch gas main

will cross KY 61 at Sta. 1+356. A proposed 4-inch gas main will run parallel to Blue Lick Road from Sta. 4+980 Lt. 10 M to Sta. 4+875 Lt. 6 M. Proposed 2-inch gas mains will cross KY 61 at Sta. 2+644 and Sta. 2+724. A proposed 8-inch medium pressure gas main will run parallel to Coral Ridge from KY 61 Sta.

3+600 Rt. 29 M to Coral Ridge Sta. 3+680 Lt. 8 M and will cross Coral Ridge from Sta. 3+680 Lt. 8 to Sta. 4+680 Rt. 12 M and will continue to run parallel to Coral Ridge from Sta. 4+680 Rt. 12 M to Sta. 4+490 Rt. 7 M.

The Contractor shall coordinate this work with the utilities.

When blasting within vicinity of gas facility a blasting plan will need to be submitted to LG&E project engineer.

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LG&E, Windstream, and Time Warner Cable share some of the same pole routes. Existing poles will be removed once all facilities have been transferred to new poles.

The Contractor shall coordinate this work with the utilities.

Bullitt County School Board – Bullitt County Schools has existing overhead facilities within the project limits from south of KY 44 to and along Blue Lick Road.

The contractor shall coordinate this work with the utilities.

The Department will consider submission of a bid as the Contractor's agreement to not make any claims for additional compensation due to delays or other conditions created by the operations of **LG&E-Electric, LG&E-Gas, Louisville Water Company, Windstream, Time Warner/Insight, and Bullitt County School Board**. Working days will not be charged for those days on which work on (Utility Company(s) Name) facilities is delayed, as provided in the current edition of the KY Standard Specifications for Road and Bridge Construction. Should a difference of opinion arise as to the rights of the Contractor and others working within the limits of, or adjacent to the project, the KYTC Resident Engineer will decide as to the respective rights of the various parties involved in order to assure the completion of the Department's work in general harmony and in a satisfactory manner, and his decision shall be final and binding upon the Contractor.

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

Louisville Water Company – The Louisville Water Company has existing 8-inch, 12-inch and 16-inch water mains which will need to be relocated within the project area. The Louisville Water Company also has proposed a 24-inch transmission main to be constructed as a part of this project.

A proposed 24-inch transmission main will run parallel to KY 61 from Sta. 1+099 Lt. 27 M to Sta. 3+600 Lt. 16 M. An existing 12-inch distribution main will be relocated to run parallel to KY 61 from Sta. 1+094 Lt. 13 M to Sta. 1+360 Lt. 13 M. An existing 12-inch distribution main will be relocated to cross KY 61 from Sta. 1+108 Lt. 4 M to Sta. 1+108 Lt. 14 M. An existing 8-inch distribution main located parallel to Cherry Street will be relocated to Cherry Street Sta. 4+986 Rt. 7 M to Sta. 4+951 Rt. 3 M. An existing 12-inch distribution main located parallel to Blue Lick Road will be relocated to Blue Lick Road Sta. 4+978 Lt. 14 M to Sta. 4+943 Lt. 8 M. An existing 12-inch distribution main located parallel to KY 61 will be relocated to Sta. 1+426 Lt. 10 M to Sta. 1+799 Lt. 10 M. An existing 12-inch distribution main will be relocated to cross KY 61 at Sta. 1+706. An existing 12-inch distribution main will be relocated to run parallel to KY 61 from Sta. 2+176 Lt. 11 M to Sta. 2+567 Lt. 11 M. An existing 16-inch distribution main

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will be relocated to run parallel to KY 61 from Sta. 2+567 Lt. 11 M to Sta. 2+617 Lt. 11 M. An existing 16-inch distribution main will be relocated to run parallel to KY 61 from Sta. 2+731 Lt. 11 M to Sta. 2+782 Lt. 12 M. An existing 16-inch distribution main will be relocated to run parallel to KY 61 from Sta. 2+820 Lt. 10 M to Sta. 2+965 Lt. 10 M. An existing 16-inch distribution main will be relocated to run parallel to KY 61 from Sta. 3+075 Lt. 10 to Sta. 3+184 Lt. 11 M. An existing 16-inch distribution main running perpendicular to KY 61 will be relocated from Sta. 3+263 Lt. 11 M to Sta. 3+263 Lt. 15 M. A proposed 24-inch transmission main will run parallel to Coral Ridge Road from KY 61 Sta. 3+600 Lt. 15 M to Coral Ridge Sta. 4+789 Lt. 8 M, will cross Coral Ridge from Sta. 4+789 Lt. 8 M to Sta. 4+760 Rt. 8 M and will run parallel to Coral Ridge from Sta. 4+760 Rt. 8 M to KY 61 Sta. 4+100 Lt. 92 M. An existing 16-inch distribution main along Coral Ridge Road will be relocated to KY 61 Sta. 3+541 Lt. 16 M to Coral Ridge Sta. 4+978 Rt. 7 M, will cross Coral Ridge from Sta. 4+978 Rt. 7 M to Sta. 4+971 Lt. 6 M and will run parallel to Coral Ridge Road from Sta. 4+971 Lt. 6 M to Sta. 4+789 Lt. 8 M. A proposed 24-inch transmission main will be cross Coral Ridge from KY 61 Sta. 4+100 Lt. 92 M to Sta. 4+102 Lt. 73 M, will cross the CSX tracks from KY 61 Sta. 4+102 Lt. 73 M to Sta. 4+110 Lt. 37, will cross KY 61 from Sta. 4+110 Lt. 37 M to Sta. 4+101 Rt. 55 M and run parallel to KY 61 4+101 Rt. 55 connecting to the existing 24-inch transmission main at Sta. 4+139 Rt. 59 M.

See the plans, specifications and special notes concerning the relocations.

Windstream – Windstream has an existing underground crossing at Sta. 1+300 which shall be installed by the roadway contractor.

See the plans, specifications and special notes concerning the relocations.

City of Shepherdsville Sewer – The City of Shepherdsville has an existing 8-inch sewer to be relocated and replaced with a 15-inch sewer from Sta. 2+417 to Sta. 2+518 on the center line.

See the plans, specifications and special notes concerning the relocations.

THE FOLLOWING RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

- No Rail Involved Minimal Rail Involved (See Below) Rail Involved (See Below)

NOTE: See “Special Note For Protection of Rail Interests” and all associated documents in proposal for details of rail involvement.

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SPECIAL CAUTION NOTE – PROTECTION OF UTILITIES

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs.

The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

BEFORE YOU DIG

The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

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

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AREA UTILITIES CONTACT LIST

<u>Utility Company/Agency</u>	<u>Contact Name</u>	<u>Contact Information</u>
1. LG&E KU (Electric) 820 West Broadway Louisville, KY 40202 LG&E Emergency Number (502) 589-1444 LG&E and KU Emergency Number 1-800-331-7370		Greg Geiser work: (502) 627-3708 Greg.Geiser@LGE-KU.com
2. LG&E (Gas) 820 West Broadway Louisville, KY 40202 Gas Emergency Number (502) 589-5511 LG&E and KU Emergency Number 1-800-331-7370		Greg Geiser work: (502) 627-3708 Greg.Geiser@LGE-KU.com
3. Louisville Water Company 550 South Third Street Louisville, KY 40202		Daniel Tegene, PE (502) 569-3649 DTegene@LWCky.com
4. Windstream Kentucky, Inc. 229 Lees Valley Road Shepherdsville, KY 40165 502-957-7127 111 S. Main St. Elizabethtown, KY 42071 130 West New Circle Rd Suite 170 Lexington, KY 40505	OR	Roger Redford cell – (270) 723-7549 Roger.Redford@Windstream.com Barry Roberts (270) 723-7358 Barry.Roberts@Windstream.com Larry Brashear Office (859) 357-6255 Cell (859) 490-0555 larry.brashear@windstream.com
5. Salt River Rural Electric Coop. Corp. 111 W. Brashear Ave. Bardstown, KY 40004		Gary Pile GPile@SRElectric.com (502) 543-3083 Don Crigler DCrigler@SRElectric.com

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|--|--|
| <p>6. East Kentucky Power Coop
4775 Lexington Road
Winchester, KY 40391</p> <p style="text-align: center;">Or</p> <p>P O Box 707
Winchester, KY 40391</p> <p style="text-align: center;">Or</p> | <p>Garry Harvey
(859)745-9601
Garry.Harvey@EKPC.coop</p> <p>Jason Witt
Jason.Witt@EKPC.coop
Cell: (859) 749-9110
Office (859) 745-9596</p> <p>Barry Warner
Barry.Warner@EKPC.coop
(859) 745-9304</p> |
| <p>7. City of Shepherdsville Sewer
634 Conestoga Parkway
P O Box 400
Shepherdsville,KY 40165</p> | <p>Scott Flemming
ph: (502) 955-7803
fax: (502) 543-2923 (City Shep)
Cell: 502-664-6254
sfleming@shepcity.com</p> |
| <p>8. Time Warner Cable Company
10168 Linn Station Road
Suite 120
Louisville, KY 40229</p> | <p>Deno Barbour
(502) 664-7395 – Cell
(502) 357-4376 – Office
Dwight.Barbour@TWCable.com</p> |
| <p>9. Lebanon Junction Water Works
City Hall - Main Street
P O Box 69
Lebanon Junction, KY 40150</p> | <p>Charles Sullivan
Cell (502) 817-0352 (not use 502)
LJWW16@yahoo.com
City Hall 502-833-4311</p> |
| <p>10. Mt. Washington Sewer & Water Commission
208 Snapp Street
Mt. Washington, KY 40047
(502) 538-4216 or 538-4781 or 955-6784</p> | <p>Dawn Hall (city clerk)
DHall@mtwKY.org</p> <p>Ronnie Fick (water & sanitary sewer)
RFick@mtwKY.org
(502)538-3771</p> |
| <p>11. Marathon Pipeline, LLC
539 S Main St, Rm 7642
Findlay, OH 45840</p> | <p>David Wisner
DSWisner@MarathonPetroleum.com
(419) 421-2211</p> |

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- | | |
|---|--|
| 12. Mid - Valley Pipeline Company
4910 Limaburg Road
Burlington, KY 41005
FAX (866) 699-1185 | Richard Calfee
(859) 371-4469x14
Cell: 859-630-8271
RTCalfee@SunocoLogistics.com |
| 13. AT&T Legacy
4500 Johnston Pkwy.
Cleveland, OH 44128 | Mike Diederich
MD4145@att.com
(216)-587-6267
(216)-212-8556
Don Garr
DRGarr@Hughes.net
Cell: (502) 741-8374 |
| 14. Taylorsville Sewer & Water, City of
70 Taylorsville Rd. P O Box 279
Taylorsville, KY 40071 | Harold Compton
HCompton@TaylorsvilleWater.org
(502) 477-3235 |
| 15. AT&T KY
3719 Bardstown Rd. | Morgan Herndon
(502) 458-7312
Louisville, KY 40218

Morgan.Herndon@ATT.com |
| 16. Bullitt County Schools
1044 Highway 44 East
Shepherdsville, KY 40165
P. O. Box 1702
Mt. Vernon, KY 40456 | Jim Jackson
Jim.Jackson@Bullitt.kyschools.us
(502) 543-2271 ext. 244 |
| 17. Bullitt Co. Sanitation District
P O Box 818
Hillview, KY 40129
502-957-6140 (office) | Jerry Kennedy
(502) 643-3165 (Cell)
BullittSanitation@Windstream.net |
| 18. Inside Connect Cable LLC(Now Insight)
4890 Knobb Creek Road
Brooks, KY 40109 | Clay Manley
clay@insideconnect.net
Tony Manley
Office: (502)955-4882
Cell: (502)593-5357 |

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- 19.** Pioneer Village Sewer Plant
4846 Brownsboro Center Arcade
Louisville, KY 40242
502-895-4273
Joe Sanders
(502) 609-2114 - cell
NO EMAIL
Owner: Jim Walser
- 20.** Kentucky Data Link (KDL now Windstream)
Project Manager
3701 Communications Way
Evansville, IN 47715
John Mcdowell
John.Mcdowell@windstream.com
(812) 759-7844(Maintenance)
WCI.Maintenance.South@Windstream.com
Timothy Gibson (Fiber location/relocation)
Timothy.Gibson@Windstream.com
(812) 454-6756
- 21.** MCI – bought out by Verizon Business
Verizon Business
2400 N Glendale Dr
MDC 3115
Richardson, TX 75082
Dean Boyers (Investigations Dept)
Dean.Boyers@Verizon.com
(972) 729-6322
- 22.** Nolin Rural Electric Cooperative Corp.
411 Ring Road
Elizabethtown, KY 42701
Donnie Probst
(270) 765-6153
- 23.** Qwest Communications Company, LLC
700 W Mineral Ave, UTD2734
Littleton, Colorado 80120
George McElvain
George.McElvain@Qwest.com
303-992-9931
Cell:720-260-2514
Fax:303-707-3252
- 24.** Level 3 Communications (Transmission)
715 S. 8th St.
Louisville, KY 40202
Kevin Webster
Kevin.Webster@Level3.com
502-777-8622
Cell (502)777-8622
Fax (502)561-6950
(continued on next page)

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Level 3 Communications (Distribution)
962 South Third Street
Louisville, KY 40203

Mark Sewell
Mark.Sewell@Level3.com
Office (502)515-9142
Cell (502)295-0939

Relocations

Level3.networkrelocations@level3.com

Send to Relocations Email

25. Crown Castle Network Operations
10170 Linn Station Road
Suite 525
Louisville, KY 40223

Brian Watkins
Brian.Watkins@CrownCastle.com
(502)318-1323
Brandy Bowling
Brandy.Bowling@CrownCastle.com
(502)318-1322
Cindy Shaffer
Cynthia.Shaffer@CrownCastle.com
(502) 318-1313
Chris Gladstone
Chris.Gladstone@CrownCastle.com
(502)689-2162

26. MCI/Verizon(Owns WUTEL)
MCI/Verizon
730 West Henry Street
Indianapolis, IN 46225

Chris Fowler
chris.fowler@verizon.com
Office: (317) 685-8050
Cell: (317) 435-6225

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GENERAL PROJECT NOTE ON UTILITY PROTECTION

Utility coordination efforts determined that there are utilities that will require relocation to accommodate this construction. The information provided below in these Special Notes for Utility Clearance, Impact on Construction may not be exact or complete. The information provided is for the contractor's use in planning the execution of the work. It shall be the road contractor's responsibility to verify the completeness and/or accuracy of all such information being furnished.

NOTE: DO NOT DISTURB THE FOLLOWING UTILITIES LOCATED WITHIN THE PROJECT DISTURB LIMITS

LG&E-Electric, LG&E-Gas, Louisville Water Company, Windstream, Time Warner/Insight, Bullitt County School Board have facilities that require relocation. Please see the notes below pertaining to their relocations.

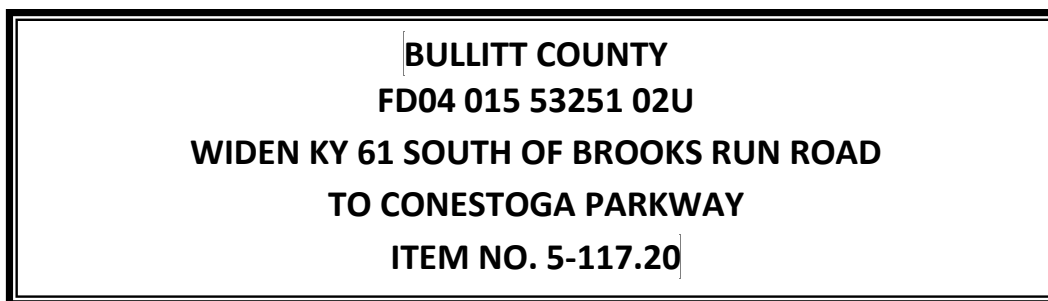
LG&E-Electric - LG&E Electric has existing overhead facilities throughout the entire project limits. Overhead line crosses proposed KY 61 from Sta. 4+060 Rt. 48 M to Sta. 4+067 Lt. 22 M before running parallel to KY 61 from Sta. 4+067 Lt. 22 M to Sta. 4+294 Lt. 13 M. Overhead line runs parallel to Frontage Road No. 1 from KY 61 Sta. 4+128 Lt. 43 M to Sta. 5+270 Lt. 8 M. Overhead facilities cross Frontage Road No. 1 from Sta. 5+193 Lt. 7 M to Sta. 4+294 Lt. 13 M and from Sta. 4+327 Lt. 38 M to Sta. 4+294 Lt. 13 M. Overhead facilities cross KY 61 from Sta. 4+294 Lt. 13 M to Sta. 4+306 Rt. 13 M and from Sta. 4+294 Lt. 13 M to Sta. 4+364 Lt. 4 M. Overhead facilities cross KY 61 from KY 61 Sta. 4+364 Lt. 4 M to Frontage Road No. 1 Sta. 5+270 Lt. 8 M, from KY 61 Sta. 4+448 Rt. 10 M to Frontage Road No. 1 Sta. 5+336 Lt. 12 M, from KY 61 Sta. 4+491 Rt. 11 M to Frontage Road No. 1 Sta. 4+382 Lt. 6 M, from KY 61 Sta. 4+534 Rt. 11 M to Frontage Road No. 1 Sta. 5+458 Lt. 1 M, from KY 61 Sta. 4+627 centerline to Frontage Road No. 1 Sta. 5+458 Lt. 1 M, and from KY 61 Sta. 4+627 centerline to Frontage Road No. 1 5+543 Lt. 22 M. Overhead facilities run parallel to KY 61 from Sta. 4+852 Rt. 19 M to Sta. 4+864 Lt. 37 M. Overhead facilities cross KY 61 from Sta. 4+710 Rt. 8 M to Sta. 4+731 Lt. 17 M, from Sta. 4+778 Rt. 15 M to Sta. 4+786 Lt. 17 M, from Sta. 4+954 Rt. 31 M to Sta. 4+952 Lt. 25 M, from Sta. 5+352 Lt. 20 M to Sta. 4+424 Rt. 17 M, from Sta. 5+424 Rt. 7 M to Sta. 5+424 Rt. 79 M, from Sta. 4+343 Lt. 6 M to Sta. 5+352 Lt. 20 M and from Sta. 5+424 Rt. 7 M to Sta. 5+424 Rt. 79 M.

These facilities will be removed or relocated by LG&E or their contactors.

LG&E, Windstream, Bullitt County Schools and Time Warner Cable share some of the same pole routes. The road contractor shall be aware that there are a number of LG&E poles that shall remain or which are expected to be installed prior to the start of the roadway work. Existing poles will be removed once **all** facilities have been transferred to new poles.

This work is to be coordinated between the Contractor and the Utility.

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LG&E-Electric - Existing overhead facilities shall remain in place as described below. Existing overhead facilities running parallel to existing KY 61 from Sta. 4+060 Rt. 48 M to Sta. 4+550 Rt. 33 M, from Sta. 4+550 Rt. 33 M to Sta. 4+954 Rt. 32 M, from Sta. 4+954 Rt. 32 M to Sta. 5+082 Rt. 32 M and from Sta. 5+082 Rt. 32 M to Sta. 5+863 Rt. 78 M.

These facilities are not to be disturbed and will remain in place.

LG&E-Gas – LG&E Gas has existing underground facilities running throughout the entire project limits. An existing medium pressure steel 8-inch gas line runs along the west side of existing KY 61 from Sta. 4+129 Lt. 38 M to Sta. 4+484 Lt. 33 M which is Sta. 4+375 Lt. 3 M crossing Frontage Road No. 1 from Frontage Road No. 1 Sta. 4+375 Lt. 3 M to Frontage Road No. Sta. 4+434 Rt. 4 M, crossing Frontage Road No. 1 from KY 61 Sta. 4+652 Lt. 16 M to KY 61 Sta. 4+669 Lt. 16 M, running parallel to KY 61 from Sta. 4+669 Lt. 16 M to Sta. 4+958 Lt. 30 M.

These facilities will be removed or relocated by LG&E or their contactors.

When blasting within vicinity of any gas facility a blasting plan will need to be submitted to LG&E project engineer.

LG&E-Gas - Existing medium pressure steel 8-inch gas line runs parallel to Coral Ridge Road from Coral Ridge Road Sta. 4+490 Rt. 7 M on to the north.

These facilities are not to be disturbed and will remain in place.

Louisville Water Company - Existing underground facilities shall remain in place as described below. An existing 24-inch transmission water main runs parallel to KY 61 from Sta. 4+139 Rt. 59 M to Sta. 4+954 Rt. 31 M. An existing 12-inch distribution water main crosses KY 61 from Sta. 3+979 Rt. 5 M to Sta. 3+995 Rt. 13 M, running parallel to KY 61 and existing KY 61 from Sta. 3+995 Rt. 13 M to Sta. 4+095 Rt. 50 M.

These facilities are not to be disturbed and will remain in place.

Windstream – Windstream has existing overhead and underground facilities throughout the entire project limits. Existing overhead facilities run parallel to Coral Ridge Road from Sta. 4+048 Lt. 56 M to 4+179 Lt. 84 M on to the north. Existing overhead facilities run parallel to Frontage Road No. 1 and KY 61 from KY 61 Sta. 4+128 Lt. 43 M to KY 61 Sta. 4+981 Lt. 8 M. Existing overhead facilities cross KY 61 from Sta. 4+294 Lt. 13 M to Sta. 4+337 Rt. 74 M, from Sta. 4+448 Rt. 10 M to Frontage Road No. 1 Sta. 4+308 Lt. 8 M and from Sta. 4+627 centerline to Sta. 4+657 Lt. 23 M. Existing overhead facilities run parallel to KY 61 from Sta. 4+981 Lt. 8 M to 5+540 Rt. 53 M. Existing overhead facilities run parallel to KY

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61 from Sta. 5+113 Lt. 9 M to Sta. 5+141 Lt. 13 M, crosses KY 61 from Sta. 5+141 Lt. 13 to Sta. 5+345 Rt. 14 M then running parallel to KY 61 from Sta. 5+345 Rt. 14 M to Sta. 5+862 Rt. 57 M. Overhead facilities run parallel to KY 61 from Sta. 5+253 Lt. 58 M to Sta. 5+343 Lt. 6 M and crossing KY 61 from Sta. 5+343 Lt. 6 M to Sta. 5+348 Rt. 35 M. Overhead facilities cross Approach Road No. 2 from Sta. 5+352 Lt. 20 M to Sta. 5+367 Lt. 45 M.

These facilities will be removed or relocated by Windstream or their contractors.

LG&E, Windstream, and Time Warner Cable share some of the same pole routes. Existing poles will be removed once all facilities have been transferred to new poles.

This work shall be coordinated by the Contractor.

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

THE FOLLOWING COMPANIES ARE RELOCATING/ADJUSTING THEIR UTILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

Not Applicable

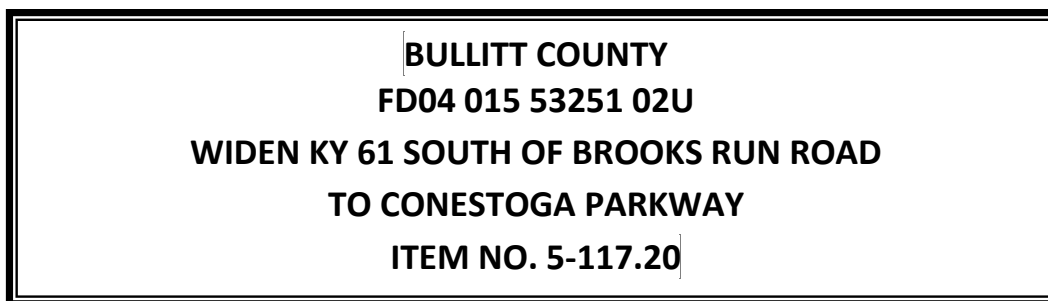
THE FOLLOWING COMPANIES HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE COMPANY OR THE COMPANY'S SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

LG&E-Electric – LG&E – Electric has proposed overhead facilities throughout the entire project limits. A proposed overhead facility will cross KY 61 from Sta. 4+060 Lt. 48 M to Sta. 4+065 Lt. 22 M, will run parallel to KY 61 from Sta. 4+065 Lt. 22 M to Sta. 4+140 Lt. 42 M. A proposed overhead facility will cross Frontage Road No. 1 from KY 61 Sta. 4+140 Lt. 42 M to Frontage Road No. 1 Sta. 4+605 Lt. 28 M. A proposed overhead facility will cross KY 61 from Sta. 4+550 Rt. 33 M to Frontage Road No. 1 Sta. 5+420 Lt. 14 M. A proposed overhead facility will cross KY 61 from Sta. 5+350 Rt. 72 M to Sta. 5+364 Lt. 29 M, will cross Approach Road No. 2 from KY 61 Sta. 5+364 Lt. 29 M to Sta. 5+367 Lt. 45 M and will run parallel to Approach Road No. 2 from KY 61 Sta. 5+367 Lt. 45 M to Sta. 4+908 Lt. 10 M.

LG&E, Windstream, and Time Warner Cable share some of the same pole routes. The road contractor shall be aware that there are a number of LG&E poles that shall remain or which are expected to be installed prior to the start of the roadway work. Existing poles will be removed once all facilities have been transferred to new poles.

The Contractor shall coordinate with the utilities the relocation of these facilities.

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Windstream – Windstream has proposed overhead facilities throughout the entire project limits. A proposed overhead facility will run parallel to Coral Ridge Road from Sta. 4+466 Lt. 5 M to Sta. 4+312 Lt. 13 M, will cross the CSX railroad from Sta. 4+312 Lt. 13 M to 5+081 Lt. 15 M. A proposed overhead facility will cross KY 61 from Sta. 4+337 Rt. 74 M to Sta. 4+347 Rt. 40 M and from Frontage Road No. 1 Sta. 4+308 Lt. 8 M to KY 61 Sta. 4+399 Rt. 42 M. A proposed overhead facility will cross Frontage Road No. 1 from Frontage Road No. 1 Sta. 4+605 Lt. 28 M to KY 61 Sta. 4+731 Lt. 17 M. A proposed overhead facility will run parallel to KY 61 from Sta. 4+731 Lt. 22 M to Sta. 5+000 Lt 24 where the facilities go underground and will be permanently attached to the proposed bridge over I-65 before running parallel to Sta. 5+136 Lt. 38 M. A temporary overhead facility will run parallel to KY 61 from Sta. 4+925 Lt. 41 M to Sta. 4+966 Rt. 2 M where the facilities go underground and will be temporarily attached to the existing bridge over I-65 before connecting to a pole at Sta. 5+136 Lt. 38 M.

LG&E, Windstream, and Time Warner Cable share some of the same pole routes. The road contractor shall be aware that there are a number of Windstream poles that shall remain or which are expected to be installed prior to the start of the roadway work. Existing poles will be removed once all facilities have been transferred to new poles.

The Contractor shall coordinate this work with the utilities.

LG&E-Gas - LG&E Gas has proposed buried facilities throughout the project area. A proposed 8-inch medium pressure gas main will run parallel to Frontage Road No. 1 from Sta. 4+126 Lt. 12 M to Sta. 4+737 Lt. 32 M, will cross Frontage Road No. 1 from Sta. 4+737 Lt. 32 M to Sta. 4+746 Lt. 22 M and will run parallel to KY 61 from Sta. 4+746 Lt. 24 M to Sta. 4+958 Lt. 30 M.

The Contractor shall coordinate this work with the utilities.

When blasting within vicinity of gas facility a blasting plan will need to be submitted to LG&E project engineer.

LG&E, Windstream, and Time Warner Cable share some of the same pole routes. Existing poles will be removed once all facilities have been transferred to new poles.

The Contractor shall coordinate this work with the utilities.

The Department will consider submission of a bid as the Contractor's agreement to not make any claims for additional compensation due to delays or other conditions created by the operations of **LG&E-Electric, LG&E-Gas, Louisville Water Company, Windstream, Time Warner/Insight, and Bullitt County School Board**. Working days will not be charged for those days on which work on (Utility Company(s) Name) facilities is delayed, as provided in the current edition of the KY Standard Specifications for Road and Bridge Construction. Should a difference of opinion arise as to the rights of the Contractor and others working within the limits of, or adjacent to the project, the KYTC Resident Engineer will decide as

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to the respective rights of the various parties involved in order to assure the completion of the Department’s work in general harmony and in a satisfactory manner, and his decision shall be final and binding upon the Contractor.

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

Louisville Water Company – The Louisville Water Company has existing 8-inch, 12-inch and 16-inch water mains which will need to be relocated within the project area. An existing 12-inch distribution main which is to be replaced and abandoned runs parallel to KY 61 from Sta. 4+095 Rt. 50 M to Sta. 4+291 Rt. 14 M where it crosses KY 61 from Sta. 4+291 Rt. 14 M to Sta. 4+359 Lt. 12 M where it runs parallel to KY 61 from Sta. 4+359 Lt. 12 M to Sta. 4+562 Lt. 12 M where it crosses KY 61 from Sta. 4+562 Lt. 12 M to Sta. 4+831 Rt. 13 M where it runs parallel to KY 61 from Sta. 4+831 Rt. 13 M to Sta. 4+931 Rt. 21 M where it crosses KY 61 and runs perpendicular and bends back into the project area crossing I-65 from Sta. 5+025 Lt. 33 M to Sta. 5+053 centerline crossing KY 61 from Sta. 5+053 centerline to Sta. 5+259 Rt. 13 M running parallel from Sta. 5+259 Rt. 13 M to Sta. 5+435 Rt. 39 M. An existing 6-inch asbestos cement distribution main crosses KY 61 from Sta. 4+062 Rt. 37 M to Sta. 4+057 Lt. 37 M where it runs parallel to KY 61 and Frontage Road No. 1 from Sta. 4+057 Lt. 37 M to Sta. 4+500 Lt. 34 M where it crosses Frontage Road No. 1 from Sta. 4+500 Lt. 34 M to Sta. 4+568 Lt. 38 M where it runs parallel to KY 61 from Sta. 4+568 Lt. 38 M to where the main ends at Sta. 4+726 Lt. 14 M. A proposed 12-inch distribution main running on the east side to replace the above existing 12-inch and 6-inch will run parallel along Frontage Road No. 1 from a 16-inch by 12-inch tee located at KY 61 Sta. 4+106 Lt. 44 M to Sta. 4+854 Lt. 31 M where it will turn perpendicular away from KY 61 before turning back east towards KY 61 and will cross I-65 from KY 61 Sta. 5+043 Lt. 80 M to Sta. 5+113 Lt. 36 M where it will continue parallel to KY 61 before tying into the existing 24-inch transmission main at Sta. 5+153 Lt. 30 M. A proposed 12-inch will run on the west side of KY 61 from Sta. 5+097 Rt. 38 M parallel to KY 61 to Sta. 5+445 Rt. 40 M where it connects to an existing 12-inch distribution main.

See the plans, specifications and special notes concerning the relocations.

THE FOLLOWING RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

- No Rail Involved**
 Minimal Rail Involved (See Below)
 Rail Involved (See Below)

NOTE: See “**Special Note For Protection of Rail Interests**” and all associated documents in proposal for details of rail involvement.

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SPECIAL CAUTION NOTE – PROTECTION OF UTILITIES

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs.

The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

BEFORE YOU DIG

The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

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

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AREA UTILITIES CONTACT LIST

<u>Utility Company/Agency</u>	<u>Contact Name</u>	<u>Contact Information</u>
1. LG&E KU (Electric) 820 West Broadway Louisville, KY 40202 LG&E Emergency Number (502) 589-1444 LG&E and KU Emergency Number 1-800-331-7370		Greg Geiser work: (502) 627-3708 Greg.Geiser@LGE-KU.com
2. LG&E (Gas) 820 West Broadway Louisville, KY 40202 Gas Emergency Number (502) 589-5511 LG&E and KU Emergency Number 1-800-331-7370		Greg Geiser work: (502) 627-3708 Greg.Geiser@LGE-KU.com
3. Louisville Water Company 550 South Third Street Louisville, KY 40202		Daniel Tegene, PE (502) 569-3649 DTegene@LWCKy.com
4. Windstream Kentucky, Inc. 229 Lees Valley Road Shepherdsville, KY 40165 502-957-7127 111 S. Main St. Elizabethtown, KY 42071	OR	Roger Redford cell – (270) 723-7549 Roger.Redford@Windstream.com Barry Roberts (270) 723-7358 Barry.Roberts@Windstream.com
130 West New Circle Rd Suite 170 Lexington, KY 40505		Larry Brashear Office (859) 357-6255 Cell (859) 490-0555 larry.brashear@windstream.com
5. Salt River Rural Electric Coop. Corp. 111 W. Brashear Ave. Bardstown, KY 40004		Gary Pile GPile@SRElectric.com (502) 543-3083 Don Crigler DCrigler@SRElectric.com

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6. East Kentucky Power Coop
4775 Lexington Road
Winchester, KY 40391

P O Box 707
Winchester, KY 40391

Or

Or

Garry Harvey
(859)745-9601
Garry.Harvey@EKPC.coop
Jason Witt
Jason.Witt@EKPC.coop
Cell: (859) 749-9110
Office (859) 745-9596
Barry Warner
Barry.Warner@EKPC.coop
(859) 745-9304
7. City of Shepherdsville Sewer
634 Conestoga Parkway
P O Box 400
Shepherdsville,KY 40165

Scott Flemming
ph: (502) 955-7803
fax: (502) 543-2923 (City Shep)
Cell: 502-664-6254
sfleming@shepcity.com
8. Time Warner Cable Company
10168 Linn Station Road
Louisville, KY 40229

Deno Barbour
(502) 664-7395 – Cell
(502) 357-4376 – Office
Dwight.Barbour@TWCable.com
9. Lebanon Junction Water Works
City Hall - Main Street
P O Box 69
Lebanon Junction, KY 40150

Charles Sullivan
Cell (502) 817-0352 (not use 502)
LJWW16@yahoo.com
City Hall 502-833-4311
10. Mt. Washington Sewer & Water Commission
208 Snapp Street
Mt. Washington, KY 40047
(502) 538-4216 or 538-4781 or 955-6784

Dawn Hall (city clerk)
DHall@mtwKY.org

Ronnie Fick (water & sanitary sewer)
RFick@mtwKY.org
(502)538-3771
11. Marathon Pipeline, LLC
539 S Main St, Rm 7642
Findlay, OH 45840

David Wisner
DSWisner@MarathonPetroleum.com
(419) 421-2211

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- | | | |
|------------|--|--|
| 12. | Mid - Valley Pipeline Company
4910 Limaburg Road
Burlington, KY 41005
FAX (866) 699-1185 | Richard Calfee
(859) 371-4469x14
Cell: 859-630-8271
RTCalfee@SunocoLogistics.com |
| 13. | AT&T Legacy
4500 Johnston Pkwy.
Cleveland, OH 44128 | Mike Diederich
MD4145@att.com
(216)-587-6267
(216)-212-8556
Don Garr
DRGarr@Hughes.net
Cell: (502) 741-8374 |
| 14. | Taylorsville Sewer & Water, City of
70 Taylorsville Rd. P O Box 279
Taylorsville, KY 40071 | Harold Compton
HCompton@TaylorsvilleWater.org
(502) 477-3235 |
| 15. | AT&T KY
3719 Bardstown Rd.
Louisville, KY 40218 | Morgan Herndon
(502) 458-7312
Morgan.Herndon@ATT.com |
| 16. | Bullitt County Schools
1044 Highway 44 East
Shepherdsville, KY 40165
P. O. Box 1702
Mt. Vernon, KY 40456 | Jim Jackson
Jim.Jackson@Bullitt.kyschools.us
(502) 543-2271 ext. 244 |
| 17. | Bullitt Co. Sanitation District
P O Box 818
Hillview, KY 40129
502-957-6140 (office) | Jerry Kennedy
(502) 643-3165 (Cell)
BullittSanitation@Windstream.net |
| 18. | Inside Connect Cable LLC(Now Insight)
4890 Knobb Creek Road
Brooks, KY 40109 | Clay Manley
clay@insideconnect.net
Tony Manley
Office: (502)955-4882
Cell: (502)593-5357 |

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- 19.** Pioneer Village Sewer Plant
4846 Brownsboro Center Arcade
Louisville, KY 40242
502-895-4273
Joe Sanders
(502) 609-2114 - cell
NO EMAIL
Owner: Jim Walser
- 20.** Kentucky Data Link (KDL now Windstream)
Project Manager
3701 Communications Way
Evansville, IN 47715
John Mcdowell
John.Mcdowell@windstream.com
(812) 759-7844(Maintenance)
- Kentucky Data Link (continued) WCI.Maintenance.South@Windstream.com
Timothy Gibson (Fiber location/relocation)
Timothy.Gibson@Windstream.com
(812) 454-6756
- 21.** MCI – bought out by Verizon Business
Verizon Business
2400 N Glendale Dr
MDC 3115
Richardson, TX 75082
Dean Boyers (Investigations Dept)
Dean.Boyers@Verizon.com
(972) 729-6322
- 22.** Nolin Rural Electric Cooperative Corp.
411 Ring Road
Elizabethtown, KY 42701
Donnie Probst
(270) 765-6153
- 23.** Qwest Communications Company, LLC
700 W Mineral Ave, UTD2734
Littleton, Colorado 80120
George McElvain
George.McElvain@Qwest.com
303-992-9931
Cell:720-260-2514
Fax:303-707-3252
- 24.** Level 3 Communications (Transmission)
715 S. 8th St.
Louisville, KY 40202
Kevin Webster
Kevin.Webster@Level3.com
502-777-8622
Cell (502)777-8622
Fax (502)561-6950
(Continued on next page)

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Level 3 Communications (Distribution)
962 South Third Street
Louisville, KY 40203

Mark Sewell
Mark.Sewell@Level3.com
Office (502)515-9142
Cell (502)295-0939

Relocations

Level3.networkrelocations@level3.com
Send to Relocations Email

25. Crown Castle Network Operations
10170 Linn Station Road
Suite 525
Louisville, KY 40223

Brian Watkins
Brian.Watkins@CrownCastle.com
(502)318-1323
Brandy Bowling
Brandy.Bowling@CrownCastle.com
(502)318-1322
Cindy Shaffer
Cynthia.Shaffer@CrownCastle.com
(502) 318-1313
Chris Gladstone
Chris.Gladstone@CrownCastle.com
(502)689-2162

26. MCI/Verizon(Owns WUTEL)
MCI/Verizon
730 West Henry Street
Indianapolis, IN 46225

Chris Fowler
chris.fowler@verizon.com
Office: (317) 685-8050
Cell: (317) 435-6225

SPECIAL NOTE FOR RAILROAD FLAGGING

Unless otherwise noted, Section references herein are to the Department's Standard Specifications for Road and Bridge Construction. All applicable portions of the Department's Standard Specifications apply unless specifically modified herein.

1. DESCRIPTION. It is estimated this project will require 180 days of railroad flagging. Guidelines for determining when flagging protection will be needed are included in the Special Provisions for Protection of Railroad Interest. The Daily Rate for this project will be \$1,000.00

2. DEFINITION OF FLAGGING. The particular Railroad(s) involved in this project will define when flagging is required (see Summary for KYTC Projects That Involve a Railroad and Special Provisions for Protection of Railroad Interest) and the number of flaggers needed. At least 2 weeks notice is required before flagging will be provided, but it could take up to 30 days. It will remain the Contractor's responsibility to schedule work including any down time (such as winter) so as to minimize the use of flagging services. The Department retains no responsibility for coordinating flagging services between the Railroad and the Contractor.

3. REDUCTION AND EXTENSION OF RAILROAD FLAGGING TIME. Based upon the Kentucky Standard Specifications, any changes in contract time for this project will be by change order. If the nature of the work in the change order necessitates additional use of railroad flagging services, then that shall be identified in that change order and the number of calendar days for railroad flagging services shall be increased. By signing the change order, the contractor waives all rights to any future request to change the number of days of railroad flagging associated with the work in that change order. Since the number of days involves the cost to the Department and not the Contractor, the number of days of railroad flagging shall not be reduced.

4. MEASUREMENT. The Department will keep track of calendar days that railroad flagging is performed. This will include any day that any railroad flagger charges a minimum of 5 hours of onsite flagging. Except that from April 1st thru November 30th this will not include days where the Contractor cannot perform at least 5 hours of the work that necessitates railroad flagging due to weather, seasonal, or temperature limitations of the Specifications, or other conditions beyond the control of the Contractor as judged by the Engineer. From Dec 1st thru March 30th any day that any railroad flagger charges a minimum of 5 hours of onsite flagging then a calendar day of railroad flagging will be counted; without regard to weather, seasonal or temperature limitations of the Specifications. The Engineer will furnish the Contractor bi-weekly statements showing the number of railroad flagging days charged for the period. The Contractor acknowledges acceptance of, and agreement with, all bi-weekly statements unless the Contractor submits a written protest containing supporting evidence for a change within 14 calendar days of receiving the bi-weekly statement.

If the number of calendar days of railroad flagging has exceeded 180 days, then the Contractor will be charged for each day that additional flagging is needed multiplied by the Daily Rate. This will be in addition to any liquidated damages or other reimbursements that the contract or the Kentucky Standard Specifications may require. This charge will continue, based upon actual flagging use, until Formal Acceptance.

If upon Formal Acceptance the total number of calendar days that railroad flagging is performed is less than XX days no additional monies will be given to the Contractor.



SPECIAL NOTES FOR PROTECTION OF RAILROAD INTEREST

CSX TRANSPORTATION, INC.

I. AUTHORITY OF RAILROAD ENGINEER AND STATE ENGINEER:

- A. *The authorized representative of the Railroad Company, hereinafter referred to as Railroad Engineer, shall have final authority in all matters affecting the safe maintenance of Railroad operations and property.*
- B. *The authorized representative of the State, hereinafter referred to as the Engineer, shall have authority over all other matters as prescribed herein and in the Project Specifications.*

II. NOTICE OF STARTING WORK:

- A. *The Contractor shall not commence any work on Railroad rights of way until he has complied with the following conditions:*
 - 1. Given the Railroad written notice, with copy to the Engineer who has been designated to be in charge of the work, **at least ten (10) days in advance** of the date he proposes to begin work on Railroad rights of way. The notice must refer to Railroad Agreement with the State by the date of the Agreement. **If flagging service is required, such notice shall be submitted at least thirty (30) days in advance** of the date scheduled to commence work. The Railroad's Contact information is on the Summary Sheet.
 - 2. Obtain written authorization from the Railroad to begin work on Railroad rights of way, such authorization to include an outline of specific conditions with which he must comply.
 - 3. Obtain written approval from the Railroad of Railroad Protective Insurance Liability coverage as required by paragraph 14 herein.
 - 4. Furnish a schedule for all work within the Railroad rights of way as required by paragraph 7, B, 1.
- B. *The Railroad's written authorization to proceed with the work shall include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative shall be specified.*

III. INTERFERENCE WITH RAILROAD OPERATIONS:

- A. *The Contractor shall so arrange and conduct his work that there will be no interference with Railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad Company or to poles, wires, and other facilities of tenants on the rights of way of the Railroad Company. The Contractor shall store materials so as to prevent trespassers from causing damage to trains or Railroad property and shall not use Railroad property without written permission from the Railroad. Whenever work is to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service (watchman) shall be deferred by the Contractor until the flagging protection required by the Railroad is available at the job site.*
- B. *Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect train operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or his representative, such provisions are insufficient, the Railroad Engineer may require or provide such provisions, as he deems necessary at Contractor's cost and expense. In any event, such unusual provisions shall be at the Contractor's expense and without cost and/or time to the Railroad or the State.*

IV. TRACK CLEARANCES

- A. *The minimum track clearances to be maintained by the Contractor during construction are shown on the Project Plans. However, before undertaking any work within Railroad rights of way, or before placing any obstruction over any track, the Contractor shall:*
1. Notify the Railroad's representative **at least 72 hours in advance** of the work.
 2. Receive assurance from the Railroad's representative that arrangements have been made for flagging service as necessary.
 3. Receive permission from the Railroad's representative to proceed with the work.
 4. Ascertain that the State Engineer has received copies of notice to the Railroad and of the Railroad's response thereto, and has approved the contractor's methods.

V. CONSTRUCTION PROCEDURES

A. General:

1. Construction work on Railroad property shall be:
 - a) Subject to the inspection and approval of the Railroad.
 - b) In accord with the Railroad's written outline of specific conditions.
 - c) In accord with the Railroad's general rules, regulations and requirements including those relating to safety, fall protection and personal protective equipment, which the Contractor shall obtain from the Railroad.
 - d) In accord with all Special Notes, Summaries, and Addendums.
2. The Railroad requires a submission of construction procedure that meets the requirements of these Special Notes and attachments. The Railroad's **submittal review period is thirty (30) days. Resubmissions will be reviewed within (30) days.**
3. All requirements of the *Construction Submission Criteria* shall be met. Requirements in addition to those in the *Construction Submission Criteria* are listed below in this document:

B. Excavation:

1. The sub grade of an operated track shall be **maintained with edge of berm at least 15'0" from centerline of track and not more than 24 inches below top of rail.** Contractor will not be required to make existing section meet this specification if substandard, in which case the existing section will be maintained.
2. Additionally, the Railroad Engineer may require installation of orange construction fencing for protection of the work area located on Railroad right of way.

C. Excavation of Structures:

1. The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles, or sheeting for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material. The procedure for doing such work, including need of and plans for shoring, shall first be submitted, with the stamp of an Engineer in the State of Kentucky, and approved by

the Engineer and the Railroad Engineer, but such approval shall not relieve the Contractor from liability.

2. Additionally, a walkway with handrail protection may be required as noted in Section XI herein.

D. Demolition, Erection, Hoisting

1. Railroad tracks and other railroad property must be protected from damage during the procedure. No crane or equipment may be set on the rails or track structure and no material may be dropped on Railroad property.
2. Loads shall not be supported while any trains are passing if that piece of equipment has the capacity to **foul a 50' envelope**.
3. The Railroad may require the Contractor to install filter fabric over the track and ballast to prevent any concrete dust or other construction debris from fouling the ballast. This will be determined during actual construction activities by the Railroad or its representatives. Fabric should extend at least 25 feet beyond the outside edges of the bridge. Fabric will remain in place until all construction activities are complete.
4. Temporary construction clearance: Ensure all falsework, bracing, or forms have a minimum vertical clearance of 23 feet above the top of the highest rail and a minimum horizontal clearance of 12 feet measured perpendicular to the centerline of the nearest track.

E. Blasting:

1. The Contractor shall obtain advance written approval of the Railroad Engineer and the Engineer for use of explosive on or adjacent to Railroad property. The request for permission to use explosives shall include a detailed blasting plan. If permission for use of explosives is granted, the Contractor will be required to comply with the following:
 - a) No blasting shall be done without the presence of an authorized representative of the Railroad. **At least 10 days advance notice** to the person designated in the Railroad's notice of authorization to proceed (see Section II.B above) will be required to arrange for the presence of an authorized Railroad representative and such flagging as the Railroad may require.

2. The Railroad representative will:
 - a) Determine the approximate location of trains and advise the Contractor the approximate amount of time available for the blasting operation and clean-up.
 - b) Have the authority to order discontinuance of blasting if, in his opinion, blasting is too hazardous or is not in accord with these Special Notes.

F. Maintenance of Railroad Facilities:

1. The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations and provide and maintain any erosion control measures as required. The Contractor shall provide erosion control measures during construction and use methods that accord with applicable state standard specifications for road and bridge construction, including either (1) silt fence; (2) berm or temporary ditches; (3) sediment basin; (4) aggregate checks; and (5) channel lining. The Contractor will promptly repair eroded areas with Railroad rights of way and to repair any other damage to the property of the Railroad or its tenants at the Contractor's expense.
2. All maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

G. Storage of Materials and Equipment:

1. Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the rights of way of the Railroad Company without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad Company will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.
2. All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

H. *Cleanup:*

1. Upon completion of the work, the Contractor shall remove from within the limits of the Railroad rights of way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said rights of way in a neat condition satisfactory to the Railroad Engineer or his authorized representative.

VI. **DAMAGES:**

- A. *The Contractor shall assume all liability for any and all damages to his/her work, employees, equipment and materials caused by Railroad traffic.*
- B. *Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.*

VII. **FLAGGING SERVICES:**

A. *When Required:*

1. Flagging services will not be provided until the contractor's insurance has been reviewed & approved by the Railroad.
2. Under the terms of the agreement between the Department and the Railroad, the **Railroad has sole authority to determine the need for flagging** required to protect its operations. In general, the requirements of such services will be whenever the Contractor's personnel or equipment are likely to be, working on the Railroad's rights of way, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a railroad structure or the railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging. If any element (workers, equipment, tools, scaffolding, etc.) may exist or fall within 50 -feet of the edge of track, a flagman is necessary.
3. Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three-(3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad's authorized representative or performs work that has not been scheduled with the Railroad's authorized representative, a flagman or flagmen may be required until the project has been completed.

B. Scheduling and Notification:

1. Not later than the time that approval is initially requested to begin work on Railroad rights of way, Contractor shall furnish to the Railroad and the Department a schedule for all work required to complete the portion of the project within Railroad rights of way and arrange for a job site meeting between the Contractor, the Department, and the Railroad's authorized representative. Flagman or Flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.
2. The Contractor will be required to give the Railroad representative **at least 10 working days of advance written notice** of intent to begin work within Railroad rights of way. If it is necessary for the Railroad to advertise a flagging job for bid, it **may take up to 30-days to obtain service**. Once begun, when work is suspended at any time for any reason, the Contractor will be required to give the Railroad representative **at least 72 hours in advance** before resuming work on Railroad rights of way. Such notice shall include sufficient details of the proposed work to enable the Railroad representative to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Engineer a copy; if notice is given verbally it shall be confirmed in writing with copy to the Engineer. If flagging is required, no work shall be undertaken until the flagman, or flagmen is present at the job site. It **may take up to 30 days to obtain flagging initially** from the Railroad. When flagging begins the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer needed and may be unable to be called for on a spot basis. If flagging becomes unnecessary and is suspended, it **may take up to 30 days to again obtain flagging services** from the Railroad. Due to labor agreements, it is necessary to give **5 working days notice before flagging service may be discontinued** and responsibility for payment stopped.
3. If, after the flagman is assigned to the project site, emergencies arise which require the flagman's presence elsewhere, and then the Contractor shall delay work on Railroad rights of way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Department or Railroad.
4. When demobilizing, the Contractor shall contact the flagman to avoid unnecessary flagging charges. This communication shall be documented.

C. *Payment:*

1. **The Cabinet will be responsible for paying the Railroad directly for any and all costs of flagging,** which may be required to accomplish the construction.
2. The estimated cost of flagging is listed on the Summary Sheet. The charge to the Cabinet by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required.
3. Work by a flagman (M/W) in excess of 8 hours per day or 40 hours per week or on rest days, but not more than 16 hours a day will result in overtime pay at 1 ½ times the appropriate rate. Work by a flagman (M/W) in excess of 16 hours per day will result in overtime pay at 2 times the appropriate rate. Flagman (M/W) working in excess of 16 hours must receive a minimum of 5 hours of rest between shifts or their next shift of work is paid at the overtime rate of 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 ½ times the normal rate.

Work by a flagman (T&E) in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 ½ times the appropriate rate. After a 12 hour work day the flagman (T&E) must be provided with 12 hours of rest. Flagman (T&E) who work six days consecutive days must receive two days off.

Flagman's work day begins and ends at his reporting location.

4. Railroad work involved in preparing and handling bills will also be charged to the Contractor. Charges to the Department by the Railroad shall be in accordance with applicable provisions of Subchapter B, Part 140, Subpart I and Subchapter G, Part 646, Subpart B of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments. Flagging costs are subject to change. The above estimates of flagging cost are provided for information only and are not binding in any way.

D. Verification:

1. The Contractor and Project Engineer will review and sign the Railroad flagman's time sheet, attesting that the flagman was present during the time recorded. Flagman may be removed by Railroad if form is not signed. If flagman is removed, the Contractor will not be allowed to re-enter the Railroad rights of way until the issue is resolved. Any complaints concerning flagman or flagmen must be resolved in a timely manner. If need for flagman or flagmen is questioned, please contact the Railroad's Representative listed on the Project Summary Sheet. All verbal complaints must be confirmed in writing by the Contractor within 5 working days with copy to the Highway Engineer. All written correspondence should be addressed to the Railroad's Representative listed on the Project Summary Sheet.
2. The Railroad flagman assigned to the project will be responsible for notifying the Project Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The Project Engineer will document such notification in the project records. When requested, the Project Engineer will also sign the flagman's diary showing daily time spent and activity at the project site.

VIII. HAUL ACROSS RAILROAD:

- A. Where the plans show or imply that materials of any nature must be hauled across a Railroad, unless the plans clearly show that the State has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad. The Contractor will be required to bear all costs incidental, including flagging, to such crossings whether services are performed by his own forces or by Railroad personnel.*
- B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad Company unless a license agreement or right of entry is granted and executed for its installation, maintenance, necessary watching and flagging thereof and removal, all at the expense of the Contractor. **The approval process for an agreement normally takes 90-days.***

IX. WORK FOR THE BENEFIT OF THE CONTRACTOR:

- A. *All temporary or permanent changes in wire lines on the Railroad or other facilities which are considered necessary to the project are shown on the plans; included in the force account agreement between the State and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the State and/or the Railroad.*
- B. *Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.*

X. COOPERATION AND DELAYS:

- A. *It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance therefore.*
- B. *Train schedules cannot be provided to the Contractor. It is the Contractor's responsibility to contact the Railroad in order to arrange "Track Time." This "Track Time" will be an agreed upon prearranged time period (duration) that the Railroad will, without undue burden, schedule no train traffic to facilitate the Contractor's work on or near Railroad right-of-way. This track time must be arranged during the submission review process.*
- C. *No charge or claims of the Contractor against either the Department or the Railroad will be allowed for hindrance or delay on account of railroad traffic; any work done by the Railroad or other delay incident to or necessary for safe maintenance of Railroad traffic or for any delays due to compliance with these Special Notes.*
- D. *The Contractor shall cooperate with others participating in the construction of the Project to the end that all work may be carried on to the best advantage.*
- E. *The Railroad does not assume any responsibility for work performed by others in connection with the Project. No claims of the Contractor against the Railroad for any inconvenience, delay, or additional cost incurred by the Contractor on account of operations by others shall be filed.*

XI. TRAINMAN'S WALKWAYS:

- A. *Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than ~~12-10~~ feet from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railroad's protective service is provided shall be removed before the close of each day. If there is any excavation near the walkway, a handrail, with 12'-0" **minimum clearance from centerline of track**, shall be placed.*

XII. GUIDELINES FOR PERSONNEL ON RAILROAD RIGHTS OF WAY:

- A. *All persons shall wear hard hats and reflective vest. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip on type boots is prohibited. High top (6-inch or more) safety-toe shoes with laces, oil-resistant soles, and a distinct separation between heel and sole are required.*
- B. *No one is allowed within 25' of the centerline of the track without specific authorization from the flagman.*
- C. *All persons working near track when train is passing are to look out for dragging bands, chains and protruding or shifting cargo.*
- D. *No one is allowed to cross tracks without specific authorization from the flagman.*
- E. *All work within 25' of track must stop when train is passing.*
- F. *No steel tape or chain will be allowed to cross or touch rails without permission.*

XIII. GUIDELINES FOR EQUIPMENT ON RAILROAD RIGHTS OF WAY:

- A. *No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15' of centerline of track without specific permission from Railroad Engineer.*
- B. *No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.*
- C. *All employees will stay with their machines when crane or boom equipment is pointed toward track.*
- D. *All cranes and boom equipment under load will stop work while a train is passing (including pile driving).*

- E. *Swinging loads must be secured to prevent movement while train is passing.*
- F. *No loads will be suspended above a moving train.*
- G. *No equipment will be allowed within 50' of centerline of track without specific authorization of the flagman.*
- H. *Trucks, tractors or any equipment will not touch ballast line without specific permission from railroad official and flagman.*
- I. *No equipment or load movement within 50' or above a standing train or other equipment without specific authorization of the flagman.*
- J. *All operating equipment within 50' of track must halt operations when a train is passing. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.*
- K. *All equipment, loads and cables are prohibited from touching rails.*
- L. *While clearing and grubbing, no vegetation will be removed from railroad embankment with heavy equipment without specific permission from the Railroad Engineer and flagman.*
- M. *No equipment or materials will be parked or stored on Railroad's property unless specific permission is granted from the Railroad Engineer.*
- N. *All unattended equipment that is left parked on Railroad property shall be effectively immobilized so that it cannot be moved by unauthorized persons.*
- O. *All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.*

XIV. INSURANCE:

- A. *In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Contractor will be required to carry insurance of the following kinds:*
 - 1. *Commercial General Liability coverage at their sole cost and expense with limits of not less than **\$5,000,000** in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name the Railroad as an additional insured.*
 - 2. *Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than **\$1,000,000**, which insurance must contain a waiver of subrogation against the Railroad and its affiliates.*

3. Commercial automobile liability insurance with limits of not less than **\$1,000,000** combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name the Railroad as an additional insured.
4. Railroad Protective Liability (RPL) insurance with limits of not less than **\$5,000,000** combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of **\$10,000,000**, which insurance shall satisfy the following additional requirements:
 - a. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance – Insurance Services Office (ISO) Form CG 00 35.
 - b. The Railroad must be the named insured on the Railroad Protective Insurance Policy
 - c. Name and Address of the Contractor must be shown on the Declarations page.
 - d. Description of operations must appear on the Declarations page and must match the Project description, including project or contract identification numbers.
 - e. Terrorism Risk Insurance Act (TRIA) coverage must be included.
 - f. Authorized endorsements must include:
 - (i). Pollution Exclusion Amendment – CG 28 31, unless using form CG 00 35 version 96 and later.
 - g. Authorized endorsements may include:
 - (i). Broad form Nuclear Exclusion – IL 00 21
 - (ii). 30-day Advance Notices of Non-renewal or cancellation
 - (iii). Required State Cancellation Endorsement
 - (iv). Quick Reference or Index – CL/IL 240
 - h. Authorized endorsements may not include:
 - (i). A Pollution Exclusion Endorsement except CG 28 31
 - (ii). An Endorsement that excludes TRIA coverage
 - (iii). An Endorsement that limits or excludes Professional Liability coverage
 - (iv). A Non-Cumulation of Liability or Pyramiding of Limits Endorsement

- (v). A Known Injury Endorsement
 - (vi). A Sole Agent Endorsement
 - (vii). A Punitive or Exemplary Damages Exclusion
 - (viii). A 'Common Policy Conditions' Endorsement
 - (ix). Policies that contain any type of deductible
 - (x). Any endorsement that is not named in Section 4 (f) or (g) above that the Railroad deems unacceptable
5. All insurance companies must be A. M. Best rated A- and Class VII or better.
6. Such additional or different insurance as the Railroad may require.
- B. Additional Terms:*
- 1. Contractor must submit the original Railroad Protective Liability policy, Certificates of Insurance, and all notices and correspondence regarding the insurance policy to the contact listed on the Project Summary Sheet.
 - 2. The Contractor may not begin work on the Project until it has received the Railroad's written approval or the required insurance.
- C. Insurance policies shall follow the requirements of Subchapter G, Part 646, Subpart A of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments.*
- D. If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor shall be provided by or in behalf of the subcontractor to cover his operations. Endorsements to the Prime Contractor's policies specifically naming subcontractors and describing their operations will be acceptable for this purpose.*
- E. All insurance herein before specified shall be carried until all work required to be performed under the terms of the contract has been satisfactorily completed within the limits of the rights of way of the Railroad as evidenced by the formal acceptance by the Department. Insuring Companies may cancel insurance by permission of the Department and Railroad or on **thirty (30) days written notice** to the Department and Railroad Insurance Contacts as listed on the Project Summary Sheet.*

XV. FAILURE TO COMPLY:

- A. *These Special Notes are supplemental and amendatory to the current version of the Kentucky Department of Highways' Standard Specifications for Road and Bridge Construction and amendments thereof, and where in conflict therewith, these Special Notes shall govern.*
- B. *In the event the Contractor violates or fails to comply with any of the requirements of these Special Notes:*
1. The Railroad Engineer may require that the Contractor vacate Railroad property.
 2. The Engineer may withhold any and all monies due the Contractor on pay estimates.
 3. Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

XVI. PAYMENT FOR COST OF COMPLIANCE:

- A. *No separate payment will be made for any extra cost incurred on account of compliance with these Special Notes. All such cost shall be included in prices bid for other items of the work as specified in the payment items.*



Kentucky Transportation Cabinet
Division of Right of Way & Utilities

TC 69-008
08/2010
Page 1 of 2

SUMMARY FOR KYTC PROJECTS THAT INVOLVE A RAILROAD

Date: 8/29/2015 (enter using M/d/yyyy format)

This project actively involves the below listed railroad company. This Project Summary provides an abbreviated listing of project specific railroad data. The detailed needs of the specified railroad company are included in the Special Notes for Protection of Railroad Interest in the proposal package. By submitting a bid, the contractor attests that they have dutifully considered and accepted the provisions as defined in both documents.

GENERAL ROAD PROJECT INFORMATION (This section must be provided by KYTC)

County: Bullitt
Federal Number: N/A
State Number: FD04 015 53251 02U
Route: KY 61
Project Description: Widen KY 61 from Sheperdsville Extending Northerly to Existing 4-Lane
Item Number: 05-117.00 Highway Milepost: 014-020

GENERAL RAIL INFORMATION (The below sections must be provided by Railroad Company)

Rail Company Name: CSX Transportation, Inc.
AAR-DOT# (if applicable): 343 529T Railroad Milepost: 000-16.53
Freight: Train Count (6am to 6pm): 11 Train Count (6pm to 6am): 6 Train Count (24 hr total): 17 Max Speed: 60 mph
Passenger: Train Cnt. (6am to 6pm): 0 Train Cnt. (6pm to 6am): 0 Train Cnt. (24 hr total): 0 Max Speed: 0 mph
(This information is necessary to acquire the necessary insurances when working with Railroad Right of Way)

INSURANCE REQUIREMENTS

The named insured, description of the work and designation of the job site to be shown on the Policy are as follows:

- (a) Named Insured: CSX Transportation, Inc.
 - (b) The project description should be as indicated in the General Road Project Information section.
 - (c) The designation of the jobsite is the route, Milepost, and AAR-DOT# listed above.
-

FLAGGING INFORMATION

Flagging Estimate:

Flagging will be paid by KYTC directly to CSX

Hourly Rate:

\$885.00 per day based on a 12 hour day effective as of the date of this document.

Work by a flagman in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 ½ times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime pay at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 ½ times the normal rate.

Forecasted Rate Increases:

Rates will increase to \$0.00 per hour based on a 0 hour day effective _____ (enter using M/d/yyyy format).

RAILROAD CONTACTS

(to be provided by Railroad Company)

General Railroad Contact:

Amanda J. DeCesare
CSX Transportation, Inc.
Public Projects Group
500 Meijer Dr., Suite 305
Florence, KY 41042
(Phone) 859-426-6924
(Email) amanda_decasare@csx.com

Regional Representative (Roadmaster):

Ethan Feagan
Roadmaster for CSX
1200 Don Hudson Blvd
Louisville, KY 40219
(Cell) 828-728-6664
(Phone) 502-364-1133
(Email) Ethan_Feagan@csx.com

Insurance contact:

CSX Corporation
Insurance Department

(Phone) _____
(Email) insurancedocuments@csx.com

Railroad Designer Contact:

Contractor or In-House Employee? Consultant

Matthew Walicki, PE
Project Engineer
AECOM
1700 Market Street, Suite 1600
Philadelphia, PA 19103
(Phone) 215-789-2122
(Email) Matt.Walicki@AECOM.com

Railroad Construction Contact:

Contractor or In-House Employee? Consultant

Christopher M Johnson, PE
AECOM
1360 Peachtree Street, Suite 500
Atlanta, GA 30309

(Phone) 404-965-7049
(Email) Christopher.Johnson@AECOM.com

KENTUCKY TRANSPORTATION CABINET CONTACTS

(to be provided by KYTC)

KYTC Railroad Coordinator:

Allen Rust, PE
Div. of Right of Way & Utilities
Kentucky Transportation Cabinet
200 Mero Street, 5th Floor East
Frankfort, Kentucky 40622
(Phone) 502-782-4950
(Email) allen.rust@ky.gov

KYTC Construction Procurement Director:

Rachel Mills, Director
Div. of Construction Procurement
Kentucky Transportation Cabinet
200 Mero Street, 3rd Floor West
Frankfort, Kentucky 40622
(Phone) 502-782-5152
(Email) Rachel.Mills@ky.gov

KYTC Construction Director:

Ryan Griffith, Director
Div. of Construction Procurement
Kentucky Transportation Cabinet
200 Mero Street, 3rd Floor West
Frankfort, Kentucky 40622
(Phone) 502-782-5127
(Email) ryan.griffith@ky.gov



The project specific information provided herein is valid as of the date indicated. However, the specific information may be subject to change due to the normal business operations of all parties. The terms and conditions defined here, and in the bid proposal in its entirety, are inclusive and constant.

CSX TRANSPORTATION

CONSTRUCTION SUBMISSION CRITERIA

CSXT Design and Construction
Public Projects Group
Jacksonville, FL
Date Issued: November 1, 2013

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INTRODUCTION

The intent of this document is to guide outside agencies and their Contractors when performing work on, over, or with potential to impact CSXT property (ROW). Work plans shall be submitted for review to the designated CSXT Engineering Representative for all work which presents the potential to affect CSXT property or operations; this document shall serve as a guide in preparing these work plans. All work shall be performed in a manner that does not adversely impact CSXT operations or safety; as such, the requirements of this document shall be strictly adhered to, in addition to all other applicable standards associated with the construction. Applicable standards include, but are not limited to, CSXT Standards and Special Provisions, CSXT Insurance Requirements, CSXT Pipeline Occupancy Criteria, as well as the governing local, county, state and federal requirements. It shall be noted that this document and all other CSXT standards are subject to change without notice, and future revisions will be made available at the CSXT website: www.csx.com.

I. DEFINITIONS

1. **Agency** – The project sponsor (i.e. State DOT, Local Agencies, Private Developer, etc.)
2. **AREMA** – American Railway Engineering and Maintenance-of-Way Association – the North American railroad industry standards group. The use of this term shall be in specific reference to the AREMA Manual for Railway Engineering.
3. **Construction Submission** – The Agency or its representative shall submit six (6) sets of plans, supporting calculations, and detailed means and methods procedures for the specific proposed activity. All plans, specifications, and supporting calculations shall be signed/sealed by a Professional Engineer as defined below.
4. **Controlled Demolition** – Removal of an existing structure or subcomponents in a manner that positively prevents any debris or material from falling, impacting, or otherwise affecting CSXT employees, equipment or property. Provisions shall be made to ensure that there is no impairment of railroad operations or CSXT’s ability to access its property at all times.
5. **Contractor** – The Agency’s representative retained to perform the project work.
6. **Engineer** – CSXT Engineering Representative or a GEC authorized to act on the behalf of CSXT.
7. **Flagman** – A qualified CSXT employee with the sole responsibility to direct or restrict movement of trains, at or through a specific location, to provide protection for workers.
8. **GEC** – General Engineering Consultant who has been authorized to act on the behalf of CSXT.
9. **Horizontal Clearance** – Distance measured perpendicularly from centerline of any track to the nearest obstruction at any elevation between TOR and the maximum vertical clearance of the track.
10. **Professional Engineer** – An engineer who is licensed in State or Commonwealth in which the project is to occur. All plans, specifications, and supporting calculations shall be prepared by the Licensed Professional Engineer and shall bear his/her seal and signature.
11. **Potential to Foul** – Work having the possibility of impacting CSXT property or operations; defined as one or more of the following:
 - a. Any activity where access onto CSXT property is required.
 - b. Any activity where work is being performed on CSXT ROW.
 - c. Any excavation work adjacent to CSXT tracks or facilities, within the Theoretical Railroad Live Load Influence Zone, or where the active earth pressure zone extends within the CSXT property limits.

- d. The use of any equipment where, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within twenty five feet (25'-0") of the nearest track centerline. This is based upon the proposed location of the equipment during use, and may be a function of the equipment boom length. Note that hoisting equipment with the potential to foul must satisfy the 150% factor of safety requirement for lifting capacities.
 - e. Any work where the scatter of debris, or other materials has the potential to encroach within twenty five feet (25'-0") of the nearest track centerline.
 - f. Any work where significant vibration forces may be induced upon the track structure or existing structures located under, over, or adjacent to the track structure.
 - g. Any other work which poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact railroad property, as determined by CSXT.
12. **ROW** – Right of Way; Refers to CSXT Right-of-Way as well as all CSXT property and facilities. This includes all aerial space within the property limits, and any underground facilities.
13. **Submission Review Period** - a minimum of thirty (30) days in advance of start of work. Up to thirty (30) days will be required for the initial review response. Up to an additional thirty (30) days may be required to review any/all subsequent submissions or resubmission.
14. **Theoretical Railroad Live Load Influence Zone** – A 1½ horizontal to 1 vertical theoretical slope line starting 18 inches (1'-6") below top of tie elevation and twelve feet (12'-0") from the centerline of the nearest track.
15. **TOR** – Top of Rail. This is the base point for clearance measurements. It refers to the crown (top) of the steel rail; the point where train wheels bear on the steel rails.
16. **Track Structure** – All load bearing elements which support the train. This includes, but is not limited to, the rail, ties, appurtenances, ballast, sub-ballast, embankment, retaining walls, and bridge structures.
17. **Vertical Clearance** – Distance measured from TOR to the lowest obstruction within six feet (6'-0") of the track centerline, in either direction.

II. GENERAL SUBMISSION REQUIREMENTS

- A. A construction work plan is required to be submitted by the Agency or its Contractor, for review and acceptance, prior to accessing or performing any work with Potential to Foul.
- B. The Agency or its representative shall submit six (6) sets of plans, specifications, supporting calculations, and detailed means and methods procedures for the specific proposed work activity.
- C. Construction submissions shall include all information relevant to the work activity, and shall clearly and concisely explain the nature of the work, how it is being performed, and what measures are being taken to ensure that railroad property and operations are continuously maintained.
- D. All construction plans shall include a map of the work site, depicting the CSXT tracks, the CSXT right of way, proposed means of access, proposed locations for equipment and material staging (dimensioned from nearest track centerline), as well as all other relevant project information. An elevation drawing may also be necessary in order to depict clearances or other components of the work.
- E. Please note that CSXT will not provide pricing to individual contractors involved in bidding projects. Bidding contractors shall request information from the agency and not CSXT.
- F. The Contractor shall install a geotextile fabric ballast protection system to prevent construction or demolition debris and fines from fouling ballast. The geotextile ballast protection system shall be installed and maintained by the Contractor to the satisfaction of the Engineer.
- G. The Engineer shall be kept aware of the construction schedule. The Contractor shall provide timely communication to the Engineer when scheduling the work such that the Engineer may be present during the work. The Contractor's schedule shall not dictate the work plan review schedule, and flagging shall not be scheduled prior to receipt of an accepted work plan.
- H. At any time during construction activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances that may create a potential hazard to rail operations or CSXT facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSXT and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.
- I. Blasting will not be permitted to demolish a structure over or within CSXT's right-of-way. When blasting off of CSXT property but with Potential to Foul, vibration monitoring, track settlement surveying, and/or other protective measures may be required as determined by the Engineer.
- J. Blasting is not permitted adjacent to CSXT right-of-way without written approval from the Chief Engineer, CSXT.
- K. Mechanical and chemical means of rock removal must be explored before blasting is considered. If written permission for the use of explosives is granted, the Agency or Contractor must submit a work plan satisfying the following requirements:
 1. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Agency or Contractor.
 2. Electronic detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.
 3. No blasting shall be done without the presence of an authorized representative of CSXT. Advance notice to the Engineer is required to arrange for the presence of an authorized CSXT representative and any flagging that CSXT may require.
 4. Agency or Contractor must have at the project site adequate equipment, labor and materials, and allow sufficient time, to clean up debris resulting from the blasting and correct any misalignment of tracks or other damage to CSXT property resulting from the blasting. Any corrective measures required must be performed as directed by the Engineer at the Agency's or Contractor's expense without any delay to trains. If Agency's or Contractor's actions result in the delay of any trains including passenger trains, the Agency or Contractor shall bear the entire cost thereof.

5. The Agency or Contractor may not store explosives on CSXT property.
6. At any time during blasting activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances that may create a potential hazard to rail operations or CSXT facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSXT and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

III. HOISTING OPERATIONS

- A. All proposed hoisting operations with Potential to Foul shall be submitted in accordance with the following:
 1. A plan view drawing shall depict the work site, the CSXT track(s), the proposed location(s) of the lifting equipment, as well as the proposed locations for picking, any intermediate staging, and setting the load(s). All locations shall be dimensioned from centerline of the nearest track. Crane locations shall also be dimensioned from a stationary point at the work site for field confirmation.
 2. Computations showing the anticipated weight of all picks. Computations shall be made based upon the field-verified plans of the existing structure. Pick weights shall account for the weight of concrete rubble or other materials attached to the component being removed; this includes the weight of subsequent rigging devices/components. Rigging components shall be sized for the subsequent pick weight.
 3. All lifting equipment, rigging devices, and other load bearing elements shall have a rated (safe lifting) capacity that is greater than or equal to 150% of the load it is carrying, as a factor of safety. Supporting calculations shall be furnished to verify the minimum capacity requirement is maintained for the duration of the hoisting operation.
 4. Dynamic hoisting operations are prohibited when carrying a load with the Potential to Foul. Cranes or other lifting equipment shall remain stationary during lifting. (i.e. no moving picks).
 5. For lifting equipment, the manufacturer's capacity charts, including crane, counterweight, maximum boom angle, and boom nomenclature is to be submitted.
 6. A schematic rigging diagram must be provided to clearly call out each rigging component from crane hook to the material being hoisted. Copies of catalog or information sheets shall be provided to verify rigging weights and capacities.
 7. For built-up rigging devices, the contractor shall submit the following:
 - i. Details of the device, calling out material types, sizes, connections and other properties.
 - ii. Load test certification documents and/or design computations bearing the seal and signature of a Professional Engineer. Load test shall be performed in the configuration of its intended use as part of the subject demolition procedure.
 - iii. Copies of the latest inspection reports of the rigging device. The device shall be inspected within one (1) calendar year of the proposed date for use.
 8. A detail shall be provided showing the crane outrigger setup, including dimensions from adjacent slopes or facilities. The detail shall indicate requirements for bearing surface preparation, including material requirements and compaction efforts. As a minimum, outriggers and/or tracks shall bear on mats, positioned on level material with adequate bearing capacity.
 9. A complete written narrative that describes the sequence of events, indicating the order of lifts and any repositioning or re-hitching of the crane(s).

IV. DEMOLITION PROCEDURE

- A. The Agency or its Contractor shall submit a detailed procedure for a controlled demolition of any structure on, over, or adjacent to the ROW. The controlled demolition procedure must be approved by the Engineer prior to beginning work on the project.
- B. Existing Condition of structure being demolished:
1. The Contractor shall submit as-built plans for the structure(s) being demolished.
 2. If as-built plans are unavailable, the Contractor shall perform an investigation of the structure, including any foundations, substructures, etc. The field measurements are to be made under the supervision of the Professional Engineer submitting the demolition procedure. Findings shall be submitted as part of the demolition means and methods submittal for review by the Engineer.
 3. Any proposed method for temporary stabilization of the structure during the demolition shall be based on the existing plans or investigative findings, and submitted as part of the demolition means and methods for review by the Engineer.
- C. Demolition work plans shall include a schematic plan depicting the proposed locations of the following, at various stages of the demolition:
1. All cranes and equipment, calling out the operating radii.
 2. All proposed access and staging locations with all dimensions referenced from the center line of the nearest track.
 3. Proposed locations for stockpiling material or locations for truck loading.
 4. The location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions.
 5. Note that no crane or equipment may be set on the CSXT rails or track structure and no material may be dropped on CSXT property.
- D. Demolition submittal shall also include the following information:
1. All hoisting details, as dictated by Section III of this document.
 2. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical subtasks (i.e., torch/saw cutting various portions of the superstructure or substructure, dismantling splices, installing temporary bracing, etc.) shall be furnished so that the potential impact(s) to CSXT operations may be assessed and eliminated or minimized.
 3. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.
 4. Design and supporting calculations shall be prepared, signed, and sealed by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review. A guardrail will be required to be installed in a track in the proximity of temporary bents or shoring towers, when located within twelve feet (12'-0") from the centerline of the track. The guardrail will be installed by CSXT forces, at the expense of the Agency or its contractor.
- E. Girders or girder systems shall be stable at all times during demolition. Temporary bracing shall be provided at the piers, abutments, or other locations to resist overturning and/or buckling of the member(s). The agency shall submit a design and details of the proposed temporary bracing system, for review by the Engineer. Lateral wind forces for the temporary conditions shall be considered in accordance with AREMA, Chapter 8, Section 28.6.2. The minimum lateral wind pressure shall be fifteen pounds per square foot (15 psf).

- F. Existing, obsolete, bridge piers shall be removed to a minimum of three feet (3'-0") below the finished grade, final ditch line invert, or as directed by the Engineer.
- G. A minimum quantity of twenty five (25) tons of CSXT approved granite track ballast may be required to be furnished and stockpiled on site by the Contractor, or as directed by the Engineer.
- H. The use of acetylene gas is prohibited for use on or over CSXT property. Torch cutting shall be performed utilizing other materials such as propane.
- I. CSXT's tracks, signals, structures, and other facilities shall be protected from damage during demolition of existing structure or replacement of deck slab.
- J. Demolition Debris Shield
 - 1. On-track or ground-level debris shields (such as crane mats) are prohibited for use by CSXT.
 - 2. Demolition Debris Shield shall be installed prior to the demolition of the bridge deck or other relevant portions of the structure. The demolition debris shield shall be erected from the underside of the bridge over the track area to catch all falling debris. The debris shield shall not be the primary means of debris containment.
 - i. The demolition debris shield design and supporting calculations, all signed/sealed by a Professional Engineer, shall be submitted for review and acceptance.
 - ii. The demolition debris shield shall have a minimum design load of 50 pounds per square foot (50 psf) plus the weight of the equipment, debris, personnel, and all other loads.
 - iii. The Contractor shall verify the maximum particle size and quantity of the demolition debris generated during the procedure does not exceed the shield design loads. Shield design shall account for loads induced by particle impact; however the demolition procedure shall be such that impact forces are minimized. The debris shield shall not be the primary means of debris containment.
 - iv. The Contractor shall include installation/removal means and methods for the demolition debris shield as part of the proposed Controlled Demolition procedure submission.
 - v. The demolition debris shield shall provide twenty three feet (23'-0") minimum vertical clearance, or maintain the existing vertical clearance if the existing clearance is less than twenty three feet (23'-0").
 - vi. Horizontal clearance to the centerline of the track should not be reduced unless approved by the Engineer.
 - vii. The Contractor shall clean the demolition debris shield daily or more frequently as dictated either by the approved design parameters or as directed by the Engineer.
- K. Vertical Demolition Debris Shield
 - 1. This type of shield may be required for substructure removals in close proximity to CSXT track and other facilities, as determined by the Engineer.
 - 2. The Agency or its Contractor shall submit detailed plans with detailed calculations, prepared, signed, and sealed by a Professional Engineer, of the protection shield.

V. ERECTION PROCEDURE

- A. The Agency or its Contractor shall submit a detailed procedure for erection of a structure with Potential to Foul. The erection procedure must be approved by the Engineer prior to beginning work on the project.
- B. Erection work plans shall include a schematic plan depicting the following, at all stages of the construction:
 - 1. All proposed locations of all cranes and equipment, calling out the operating radii.
 - 2. All proposed access and staging locations with all dimensions referenced from the center line of the nearest track.
 - 3. All proposed locations for stockpiling material or locations for truck loading.
 - 4. The location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions.
- C. No crane or equipment may be set on the CSXT rails or track structure and no material may be dropped on CSXT property.
- D. For erection of a structure over the tracks, the following information shall be submitted for review and acceptance by the Engineer, at least thirty (30) days prior to erection:
 - 1. As-built beam seat elevations – field surveyed upon completion of pier/abutment construction.
 - 2. Current Top of Rail (TOR) elevations – field measured at the time of as-built elevation collection.
 - 3. Computations verifying the anticipated minimum vertical clearance in the final condition which accounts for all deflection and camber, based upon the current TOR and as-built beam seat elevations. The anticipated minimum vertical clearance shall be greater than or equal to that which is indicated by the approved plans. Vertical clearance (see definitions) is measured from TOR to the lowest point on the overhead structure at any point within six feet (6'-0") from centerline of the track. Calculations shall be signed and sealed by a Professional Engineer.
- E. Girders or girder systems shall be stable at all times during erection. No crane may unhook prior to stabilizing the beam or girder.
 - 1. Lateral wind forces for the temporary conditions shall be considered in accordance with AREMA, Chapter 8, Section 28.6.2. The minimum lateral wind pressure shall be fifteen pounds per square foot (15 psf).
 - 2. Temporary bracing shall be provided at the piers, abutments, or other locations to resist overturning and/or buckling of the member(s). The agency shall submit a design and details of the proposed temporary bracing system, for review by the Engineer.
 - 3. Temporary bracing shall not be removed until sufficient lateral bracing or diaphragm members have been installed to establish a stable condition. Supporting calculations, furnished by the Professional Engineer, shall confirm the stable condition.
- F. Erection procedure submissions shall also include the following information:
 - 1. All hoisting details, as dictated by Section III of this document.
 - 2. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical subtasks (i.e. performing aerial splices, installing temporary bracing, installation of diaphragm members, etc.) shall be furnished so that the potential impact(s) to CSXT operations may be assessed and eliminated or minimized.
 - 3. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.

4. A guardrail will be required to be installed in a track in the proximity of temporary bents or shoring towers, when located within twelve feet (12'-0") from the centerline of the track. The guardrail will be installed by CSXT forces, at the expense of the Agency or its Contractor.
5. Design and supporting calculations prepared by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review.

VI. TEMPORARY EXCAVATION AND SHORING

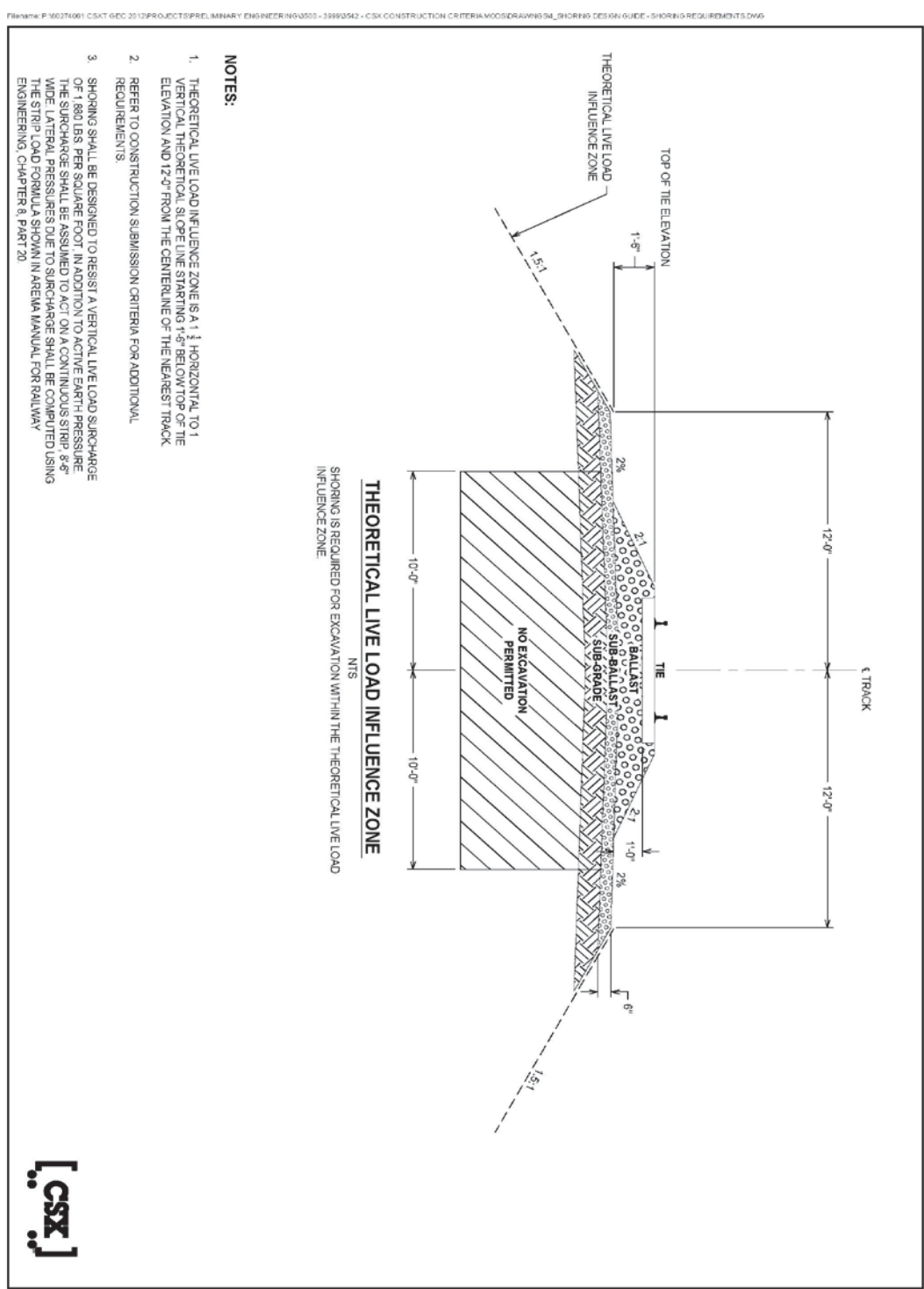
- A. The Agency or its Contractor shall submit a detailed design and procedure for the installation of a sheeting/shoring system adjacent to the tracks. Shoring protection shall be provided when excavating with Potential to Foul, or as otherwise determined by CSXT. Shoring shall be provided in accordance with the AREMA, except as noted below.
- B. Shoring may not be required if all of the following conditions are satisfied:
 1. The excavation does not encroach within the Theoretical Live Load Influence Zone. Please refer to Figure 1.
 2. The track structure is situated on level ground, or in a cut section, and on stable soil.
 3. The excavation does not adversely impact the stability of a CSXT facility (i.e. signal bungalow, drainage facility, under grade bridge, building, etc), or the stability of any structure on, over, or adjacent to CSXT property with potential to foul.
 4. Shoring is not required by any governing federal, state, local or other construction code.
- C. Shoring is required when excavating the toe of an embankment. Excavation of any embankment which supports an active CSXT track structure without shoring will not be permitted.
- D. Trench boxes are not an acceptable means of shoring. Trench boxes are prohibited for use on CSXT property or within the Theoretical Railroad Live Load Influence Zone.
- E. Shoring shall be a cofferdam-type, which completely encloses the excavation. However, where justified by site or work conditions, partial cofferdams with open sides away from the track may be permissible, as determined by the Engineer.
- F. Cofferdams shall be constructed using interlocking steel sheet piles, or when approved by the Engineer, steel soldier piles with timber lagging. Wales and struts shall be included when dictated by the design.
- G. The use of tiebacks can be permissible for temporary shoring systems, when conditions warrant. Tiebacks shall have a minimum clear cover of 6'-0", measured from the bottom of the rail. Upon completion of the work, tiebacks shall be grouted, cut off, and remain in place.
- H. All shoring systems on, or adjacent to CSXT right-of-way, shall be equipped with railings or other fall protection, compliant with the governing federal, state or local requirements. Area around pits shall be graded to eliminate all potential tripping hazards.
- I. Interlocking steel sheet piles shall be used for shoring systems qualifying one or more of the following conditions:
 1. Within 18'-0" of the nearest track centerline
 2. Within the live load influence zone
 3. Within slopes supporting the track structure
 4. As otherwise deemed necessary by the Engineer.
- J. Sheet piles qualifying for one or more of the requirements listed in Section VI.I (above) of this document shall not be removed. Sheet piles shall be left in place and cut off a minimum of 3'-0" below the finished grade, the ditch line invert, or as otherwise directed by the Engineer. The ground shall be backfilled and compacted immediately after sheet pile is cut off.

- K. The following design considerations shall be considered when preparing the shoring design package:
1. Shoring shall be designed to resist a vertical live load surcharge of 1,880 lbs. per square foot, in addition to active earth pressure. The surcharge shall be assumed to act on a continuous strip, eight feet six inches (8'-6") wide. Lateral pressures due to surcharge shall be computed using the strip load formula shown in *AREMA Manual for Railway Engineering*, Chapter 8, Part 20.
 2. Allowable stresses in materials shall be in accordance with AREMA Chapter 7, 8, and 15.3.
 3. A minimum horizontal clearance of ten feet (10'-0") from centerline of the track to face of nearest point of shoring shall be maintained, provided a twelve feet (12'-0") roadbed is maintained with a temporary walkway and handrail system.
 4. For temporary shoring systems with Potential to Foul, piles shall be plumb under full dead load. Maximum deflection at the top of wall, under full live load, shall be as follows:
 - i. ½ inch for walls within twelve feet (12'-0") of track centerline (Measured from centerline of the nearest track to the nearest point of the supporting structure).
 - ii. 1 inch for walls located greater than twelve feet (12'-0") from track centerline
- L. Shoring work plans shall be submitted in accordance with Section II of this document, as well as the following additional requirements:
1. The work plan shall include detailed drawings of the shoring systems calling out the sizes of all structural members, details of all connections. Both plan and elevation drawings shall be provided, calling out dimensions from the face of shoring relative to the nearest track centerline. The elevation drawing shall also show the height of shoring, and track elevation in relation to bottom of excavation.
 2. Full design calculations for the shoring system shall be furnished.
 3. A procedure for cutting off the sheet pile, backfilling and restoring the embankment.

VII. TRACK MONITORING

- A. When work being performed has the potential to disrupt the track structure, a work plan must be submitted detailing a track monitoring program which will serve to monitor and detect both horizontal and vertical movement of the CSXT track and roadbed.
- B. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. CSXT reserves to the right to modify the survey locations and monitoring frequency as necessary during the project.
- C. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Engineer for analysis.
- D. If any movement has occurred as determined by the Engineer, CSXT will be immediately notified. CSXT, at its sole discretion, shall have the right to immediately require all contractor operations to be ceased, have the excavated area immediately backfilled and/or determine what corrective action is required. Any corrective action required by CSXT or performed by CSXT including the monitoring of corrective action of the contractor will be at project expense.

Figure 1: Theoretical Live Load Influence Zone



Shepherdsville, Bullitt Co., KY
KYTC Project No. FD04 015 53251 02U
CSXT Milepost: 000-16.53
CSXT OP No.: KY0227

EXHIBIT D

CONTRACTOR'S ACCEPTANCE

To and for the benefit of the *Company*, ("*Company*") and to induce the *Company* to permit Contractor on or about *Company's* property for the purposes of performing work in accordance with the Agreement dated _____, 20__, between the Commonwealth of Kentucky Transportation Cabinet, Department of Highways and the *Company*, Contractor hereby agrees to abide by and perform all applicable terms of the Agreement, including, particularly Exhibits B and C as included herein.

Contractor: _____
By: _____
Name: _____
Title: _____
Date: _____

GENERAL UTILITY NOTES AND INSTRUCTIONS APPLICABLE TO ALL UTILITY WORK MADE A PART OF THE ROAD CONSTRUCTION CONTRACT

5-117.10 (FD04 015 0061 014-017)

The contractor should be aware the following utility notes and KYTC Utility Bid Item Descriptions shall supersede, replace and take precedence over any and all conflicting information that may be contained in utility owner supplied specifications contained in the contract, on plans supplied by the utility owner, or any utility owner specifications or information externally referenced in this contract.

Where information may have been omitted from these notes, bid item descriptions, utility owner supplied specifications or plans; the KYTC Standard Specifications for Road and Bridge Construction shall be referenced.

PROTECTION OF EXISTING UTILITIES

The existing utilities shown on the plans are shown as best known at the time the plans were developed and are to be used as a guide only by the Contractor. The Contractor shall use all means at his disposal to accurately locate all existing utilities, whether shown on the plans or not, prior to excavation. The contractor shall protect these utilities during construction. Any damage to existing utilities during construction that are shown or not shown on the plans shall be repaired at the Contractor's expense.

PREQUALIFIED UTILITY CONTRACTORS

Some utility owners may require contractors that perform relocation work on their respective facilities as a part of the road contract be prequalified or preapproved by the utility owner. Those utility owners with a prequalification or preapproval requirement are as follows:

**LWCo-Requires LWC pre-qualified contractor in category 1 and 4 for this project
City of Shepherdsville- Does not require pre-qualified to perform utility relocation
work under this contract.**

The bidding contractor needs to review the above list and look for a list of preapproved or prequalified contractors at the end of these general notes as identified above before bidding. Only contractors shown to be prequalified or preapproved by the utility owner on the following list(s) will be allowed to work on that utility as a part of this contract.

Any utility contractor that is not listed as prequalified or preapproved when the project is advertised for bid and wishes to be added must make request through the KYTC Contract Procurement website. The

request should be made at least one week prior to the bidding deadline to allow for review and posting on the KYTC Contract Procurement website. A contractor is only considered prequalified or preapproved when published on the KYTC Contract Procurement website. Contractors that contact the utility owner directly for preapproval or prequalification without contacting KYTC will not be considered for preapproval or prequalification for this contract. Contractors that are not prequalified or preapproved through KYTC before the bidding deadline will not be considered for prequalification or preapproval after bidding.

CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

All utility work is being performed as a part of a contract administered by KYTC; there is not a direct contract between the utility contractor and utility owner. The KYTC Section Engineer is ultimately responsible for the administration of the road contract and any utility work included in the contract.

SUBMITTALS AND CORRESPONDENCE

All submittals and correspondence of any kind relative to utility work included in the road contract shall be directed to the KYTC Section Engineer, a copy of which may also be supplied to the utility owner by the contractor to expedite handling of items like material approvals and shop drawings. All approvals and correspondence generated by the utility owner shall be directed to the KYTC Section Engineer. The KYTC Section Engineer will relay any approvals or correspondence to the utility contractor as appropriate. At no time shall any direct communication between the utility owner and utility contractor without the communication flowing through the KYTC Section Engineer be considered official and binding under the contract.

ENGINEER

Where the word "Engineer" appears in any utility owner specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the "Engineer" is the Kentucky Transportation Cabinet (KYTC) Section Engineer or designated representative and the utility owner engineer or designated representative jointly. Both engineers must mutually agree upon all decisions made with regard to the utility construction. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

Where the word “Inspector” or “Resident Project Representative” appears in the utility specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the “Inspector” or “Resident Project Representative” is the utility owner inspector and KYTC inspector jointly. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

NOTICE TO UTILITY OWNERS OF THE START OF WORK

One month before construction is to start on a utility, the utility contractor shall make notice to the KYTC Section Engineer and the utility owner of when work on a utility is anticipated to start. The utility contractor shall again make confirmation notice to the KYTC Section Engineer and the utility owner one week before utility work is to actually start.

UTILITY SHUTDOWNS

The Contractor shall not shut down any active and in-service mains, utility lines or services for any reason unless specifically given permission to do so by the utility owner. The opening and closing of valves and operating of other active utility facilities for main, utility line or utility service shut downs are to be performed by the utility owner unless specific permission is given to the contractor by the owner to make shutdowns. If and when the utility owner gives the contractor permission to shutdown mains, utility lines or utility services, the contractor shall do so following the rules, procedures and regulations of the utility owner. Any permission given by the utility owner to the contractor to shutdown active and in-service mains, utility lines or services shall be communicated to the KYTC Section Engineer by the utility owner that such permission has been given.

Notice to customers of utility shut downs is sometimes required to be performed by the utility contractor. The contractor may be required; but, is not limited to, making notice to utility customers in a certain minimum amount of time in advance of the shut down and by whatever means of communication specified by the utility owner. The means of communication to the customer may be; but is not limited to, a door hanger, notice by newspaper ad, telephone contact or any combination of communication methods deemed necessary, customary and appropriate by the utility owner. The contractor should refer to the utility owner specifications for requirements on customer notice.

Any procedure the utility owner may require the contractor to perform by specification or plan note and any expense the contractor may incur to comply with the utility owner’s shut down procedure and notice to customers shall be considered an incidental expense to the utility construction.

STATIONS AND DISTANCES

All stations and distances, when indicated for utility placement in utility relocation plans or specifications, are approximate; therefore, some minor adjustment may have to be made during construction to fit actual field conditions. Any changes in excess of 6 inches of plan location shall be reviewed and approved jointly by the KYTC Section Engineer or designated representative and utility owner engineer or

designated representative. Changes in location without prior approval shall be remedied by the contractor at his own expense if the unauthorized change creates an unacceptable conflict or condition.

RESTORATION

Temporary and permanent restoration of paved or stone areas due to utility construction shall be considered incidental to the utility work. No separate payment will be made for this work. Temporary restoration shall be as directed by the KYTC Section Engineer. Permanent restoration shall be "in-kind" as existing.

Restoration of seed and sod areas will be measured and paid under the appropriate seeding and sodding bid items established in the contract for roadway work.

BELOW ARE NOTES FOR WHEN "INST" ITEMS ARE IN THE CONTRACT MEANING THE UTILITY COMPANY IS PROVIDING CERTAIN MATERIALS FOR UTILITY RELOCATION

MATERIAL

Contrary to Utility Bid Item Descriptions, those bid items that have the text "**Inst**" at the end of the bid item will have the major components of the bid item provided by the utility owner. No direct payment will be made for the major material component(s) supplied by the utility company. All remaining materials required to construct the bid item as detailed in utility bid item descriptions, in utility specifications and utility plans that are made a part of this contract will be supplied by the contractor. The contractor's bid price should reflect the difference in cost due to the provided materials.

The following utility owners have elected to provide the following materials for work under this contract:

No materials are being supplied by the utility owner(s). All materials are to be supplied by the contractor per bid item descriptions, utility specifications and utility plans.

- *Louisville Water Company-Contractor to supply and install all material*
- *City of Shepherdsville- Contractor to supply and install all material*
- *Windstream- Contractor to supply and install all material*

SECURITY OF SUPPLIED MATERIALS

If any utility materials are to be supplied by the utility owner, it will be the responsibility of the utility contractor to secure all utility owner supplied materials after delivery to the project site. The utility contractor shall coordinate directly with the utility owner and their suppliers for delivery and security of the supplied materials. Any materials supplied by the utility owner and delivered to the construction site that are subsequently stolen, damaged or vandalized and deemed unusable shall be replaced with like materials at the contractor's expense.

GENERAL UTILITY NOTES AND INSTRUCTIONS APPLICABLE TO ALL UTILITY WORK MADE A PART OF THE ROAD CONSTRUCTION CONTRACT

5-117.20 (FD04 SPP 015 0061 016-018)

The contractor should be aware the following utility notes and KYTC Utility Bid Item Descriptions shall supersede, replace and take precedence over any and all conflicting information that may be contained in utility owner supplied specifications contained in the contract, on plans supplied by the utility owner, or any utility owner specifications or information externally referenced in this contract.

Where information may have been omitted from these notes, bid item descriptions, utility owner supplied specifications or plans; the KYTC Standard Specifications for Road and Bridge Construction shall be referenced.

PROTECTION OF EXISTING UTILITIES

The existing utilities shown on the plans are shown as best known at the time the plans were developed and are to be used as a guide only by the Contractor. The Contractor shall use all means at his disposal to accurately locate all existing utilities, whether shown on the plans or not, prior to excavation. The contractor shall protect these utilities during construction. Any damage to existing utilities during construction that are shown or not shown on the plans shall be repaired at the Contractor's expense.

PREQUALIFIED UTILITY CONTRACTORS

Some utility owners may require contractors that perform relocation work on their respective facilities as a part of the road contract be prequalified or preapproved by the utility owner. Those utility owners with a prequalification or preapproval requirement are as follows:

LWCo-Requires LWC pre-qualified contractor in category 1 and 4 for this project

The bidding contractor needs to review the above list and look for a list of preapproved or prequalified contractors at the end of these general notes as identified above before bidding. Only contractors shown to be prequalified or preapproved by the utility owner on the following list(s) will be allowed to work on that utility as a part of this contract.

Any utility contractor that is not listed as prequalified or preapproved when the project is advertised for bid and wishes to be added must make request through the KYTC Contract Procurement website. The request should be made at least one week prior to the bidding deadline to allow for review and posting on the KYTC Contract Procurement website. A contractor is only considered prequalified or preapproved when published on the KYTC Contract Procurement website. Contractors that contact the utility owner

directly for preapproval or prequalification without contacting KYTC will not be considered for preapproval or prequalification for this contract. Contractors that are not prequalified or preapproved through KYTC before the bidding deadline will not be considered for prequalification or preapproval after bidding.

CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

All utility work is being performed as a part of a contract administered by KYTC; there is not a direct contract between the utility contractor and utility owner. The KYTC Section Engineer is ultimately responsible for the administration of the road contract and any utility work included in the contract.

SUBMITTALS AND CORRESPONDENCE

All submittals and correspondence of any kind relative to utility work included in the road contract shall be directed to the KYTC Section Engineer, a copy of which may also be supplied to the utility owner by the contractor to expedite handling of items like material approvals and shop drawings. All approvals and correspondence generated by the utility owner shall be directed to the KYTC Section Engineer. The KYTC Section Engineer will relay any approvals or correspondence to the utility contractor as appropriate. At no time shall any direct communication between the utility owner and utility contractor without the communication flowing through the KYTC Section Engineer be considered official and binding under the contract.

ENGINEER

Where the word "Engineer" appears in any utility owner specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the "Engineer" is the Kentucky Transportation Cabinet (KYTC) Section Engineer or designated representative and the utility owner engineer or designated representative jointly. Both engineers must mutually agree upon all decisions made with regard to the utility construction. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

Where the word “Inspector” or “Resident Project Representative” appears in the utility specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the “Inspector” or “Resident Project Representative” is the utility owner inspector and KYTC inspector jointly. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

NOTICE TO UTILITY OWNERS OF THE START OF WORK

One month before construction is to start on a utility, the utility contractor shall make notice to the KYTC Section Engineer and the utility owner of when work on a utility is anticipated to start. The utility contractor shall again make confirmation notice to the KYTC Section Engineer and the utility owner one week before utility work is to actually start.

UTILITY SHUTDOWNS

The Contractor shall not shut down any active and in-service mains, utility lines or services for any reason unless specifically given permission to do so by the utility owner. The opening and closing of valves and operating of other active utility facilities for main, utility line or utility service shut downs are to be performed by the utility owner unless specific permission is given to the contractor by the owner to make shutdowns. If and when the utility owner gives the contractor permission to shutdown mains, utility lines or utility services, the contractor shall do so following the rules, procedures and regulations of the utility owner. Any permission given by the utility owner to the contractor to shutdown active and in-service mains, utility lines or services shall be communicated to the KYTC Section Engineer by the utility owner that such permission has been given.

Notice to customers of utility shut downs is sometimes required to be performed by the utility contractor. The contractor may be required; but, is not limited to, making notice to utility customers in a certain minimum amount of time in advance of the shut down and by whatever means of communication specified by the utility owner. The means of communication to the customer may be; but is not limited to, a door hanger, notice by newspaper ad, telephone contact or any combination of communication methods deemed necessary, customary and appropriate by the utility owner. The contractor should refer to the utility owner specifications for requirements on customer notice.

Any procedure the utility owner may require the contractor to perform by specification or plan note and any expense the contractor may incur to comply with the utility owner’s shut down procedure and notice to customers shall be considered an incidental expense to the utility construction.

STATIONS AND DISTANCES

All stations and distances, when indicated for utility placement in utility relocation plans or specifications, are approximate; therefore, some minor adjustment may have to be made during construction to fit actual field conditions. Any changes in excess of 6 inches of plan location shall be reviewed and approved jointly by the KYTC Section Engineer or designated representative and utility owner engineer or

designated representative. Changes in location without prior approval shall be remedied by the contractor at his own expense if the unauthorized change creates an unacceptable conflict or condition.

RESTORATION

Temporary and permanent restoration of paved or stone areas due to utility construction shall be considered incidental to the utility work. No separate payment will be made for this work. Temporary restoration shall be as directed by the KYTC Section Engineer. Permanent restoration shall be “in-kind” as existing.

Restoration of seed and sod areas will be measured and paid under the appropriate seeding and sodding bid items established in the contract for roadway work.

BELOW ARE NOTES FOR WHEN “INST” ITEMS ARE IN THE CONTRACT MEANING THE UTILITY COMPANY IS PROVIDING CERTAIN MATERIALS FOR UTILITY RELOCATION

MATERIAL

Contrary to Utility Bid Item Descriptions, those bid items that have the text “**Inst**” at the end of the bid item will have the major components of the bid item provided by the utility owner. No direct payment will be made for the major material component(s) supplied by the utility company. All remaining materials required to construct the bid item as detailed in utility bid item descriptions, in utility specifications and utility plans that are made a part of this contract will be supplied by the contractor. The contractor’s bid price should reflect the difference in cost due to the provided materials.

The following utility owners have elected to provide the following materials for work under this contract:

No materials are being supplied by the utility owner(s). All materials are to be supplied by the contractor per bid item descriptions, utility specifications and utility plans.

- *Louisville Water Company-Contractor to supply and install all material*

SECURITY OF SUPPLIED MATERIALS

If any utility materials are to be supplied by the utility owner, it will be the responsibility of the utility contractor to secure all utility owner supplied materials after delivery to the project site. The utility contractor shall coordinate directly with the utility owner and their suppliers for delivery and security of the supplied materials. Any materials supplied by the utility owner and delivered to the construction site that are subsequently stolen, damaged or vandalized and deemed unusable shall be replaced with like materials at the contractor’s expense.

Standard Water Bid Item Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

W METER RELOCATE This item includes all labor, equipment, excavation, additional fittings, disinfection, testing, restoration, and etc., to relocate the existing water meter (whatever size exists), meter yoke, meter box, casting, and etc., from its old location to the location shown on the plans or as directed, in accordance with the specifications and standard drawings complete and ready for use. The new service pipe (if required) will be paid under short side or long side service bid items. Any and all meter

relocations of 2 inches or less shall be paid under one bid item included in the contract regardless of size. Each individual relocation shall be paid individually under this item; however, no separate bid items will be established for meter size variations of 2 inches ID or less. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

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

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

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

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

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

W PIPE This description shall apply to all PVC, ductile iron, and polyethylene/plastic pipe bid items of every size and type to be used as water main, except those bid items defined as "Special". This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. This item shall also include pipe anchors, at each end of polyethylene pipe runs when

specified to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

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

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

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

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

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

W REMOVE TRANSITE (AC) PIPE This item shall include all labor, equipment, and materials needed for removal and disposal of the pipe as hazardous material. All work shall be performed by trained and certified personnel in accordance with all environmental laws and regulations. Any and all transite AC pipe removed shall be paid under one bid item included in the contract regardless

of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

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

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

W SERVICE RELOCATE This item is for the relocation of an existing water service line where a meter is not involved, and where an existing service line can easily be adjusted by excavating alongside and moving the line horizontally and/or vertically a short distance without cutting the service line to avoid conflicts with road construction. This item shall include excavation, labor, equipment, bedding, and

backfill to relocate the line in accordance with the plans and specifications complete and ready for use. Payment under this item shall be for each location requiring relocation. Payment shall be made under this item regardless of service size or relocation length. No separate pay items will be established for size or length variation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

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

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

W TAPPING SLEVE AND VALVE SIZE 1 OR 2 This item shall include the specified tapping sleeve, valve, valve box, concrete pad around valve box (when required in specifications or plans), labor, and equipment to install the specified tapping sleeve and valve, complete and ready for use in accordance with the plans and specifications. The size shall be the measured internal diameter of the live pipe to be tapped. The size tapping sleeve and valve to be paid under sizes 1 or 2 shall be as follows:

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

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

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

W VALVE This description shall apply to all valves of every size required in the plans and specifications

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

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

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

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

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

LOUISVILLE WATER COMPANY
WIDEN KY 61 FROM CONESTOGA PARKWAY TO SOUTH
OF WEST 4TH STREET (KY 44)
ITEM NO. 5-117.10

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GENERAL REQUIREMENTS

- A. All water main materials including but not limited to fittings, gate valves, tie-in assemblies, drain assemblies, air release assemblies, bends, pre cast vaults, steel casing pipe, spacers, end seals, polyethylene encasement and disinfection materials shall be supplied by the contractor. Material submittals shall be made to and approved by the LWC Project Manager and the KTC Project Manager prior to installation.
- B. All change order requests that impact water main construction shall be reviewed and approved by the LWC Project Manager and the KTC Project Manager.
- C. The contractor is bound by and shall comply with the provisions of the "Louisville Water Company Technical Specifications and Standard Drawings for Pipeline Construction" (2008 Edition) which shall govern work on this project for water main 4" – 20", services and hydrants.
- D. All work performed for the installation and relocation of the water main and related construction must be performed by an LWC pre-qualified contractor in the following categories:
- Category 1: 4" – 16" Ductile Iron Water Main for distribution main work.
 - Category 4: 20" – 48" Ductile Iron Water Main for transmission main work.

TRAFFIC CONTROL

- E. This project will be bid and constructed in conjunction with the Kentucky Transportation Cabinet's (KTC) Preston Highway project; therefore, no KTC permits will be required by LWC. Contractor shall obtain all permits through KTC.

WARRANTY

- F. The Contractor warrants to the Company that materials and equipment furnished by the Contractor under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Company, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.
- G. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract

Documents or a release of the Contractor's obligation to perform the work in accordance with the Contract Documents:

1. Observations by the Project Manager;
 2. Payment by KYTC;
 3. Issuance of a certificate of Substantial Completion;
 4. Use or occupancy of any part of the Work by the Company;
 5. Review of Shop Drawings or other Submittals;
 6. Any inspection, test, or approval by others; or
 7. Any correction of defective Work by the Company.
- H. Failure on the part of the Company and KYTC to insist on strict performance by the Contractor of any provision of this Contract is not a waiver of any of the Company's and KYTC's rights and/or remedies, nor shall it relieve the Contractor from performing any subsequent obligations strictly in accordance with the terms of this Contract.
- I. The Company and KYTC may, at its option, waive compliance with any particular Contract requirement. No waiver shall be effective unless in writing and signed by both the Company and the Contractor. Written waivers shall be limited to the specified provisions of this Contract specifically referred to herein, and shall not be deemed a waiver of any other provision. The written waiver shall not constitute a continuing waiver unless it states otherwise.
- J. All work shall be warranted for two (2) years from the date of Final Completion unless specified otherwise. Paved surfaces and restoration of structures will be warranted for five (5) years. Contractor-furnished materials shall be warranted for five (5) years after the pipeline is placed in service. Satisfactory performance of the water main and appurtenances, as they relate to installation, shall be warranted for two (2) years after the iron pipeline is placed in service. The Company reserves the right to require Contractor's presence at scheduled Warranty inspections held within the 12-month period following acceptance of the Project.
- K. Contractor shall assign to the Company all manufacturers' warranties. All such warranties shall be directly enforceable by the Company. Such assignment shall in no way affect the Contractor's responsibilities and duties during the warranty period.

SECTION 01010
SUMMARY OF WORK

PART 1: GENERAL

1.01 LOCATION OF WORK

- A. The work of this Contract is located in the Central Part of Bullitt County, Kentucky along KY 61 (Preston Highway).

1.02 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for the 24-inch transmission main and 6-16-inch distribution main as shown on the drawings and specified herein.
- B. The work shall include but is not necessarily limited to the following:
1. Supply and Installation of approximately 2,866 +/- linear meters (9,403 linear feet) of 600 mm (24-inch) diameter ductile iron water main, 120 +/- linear meters (394 linear feet) of 600 mm (24-inch) diameter ductile iron water main with nitrile gaskets, 706 +/- linear meters (2,316 linear feet) of 400 mm (16-inch) diameter ductile iron water main, 1,139 +/- linear meters (3,737 linear feet) of 300 mm (12-inch) diameter ductile iron water main, 38 +/- linear meters (125 linear feet) of 200 mm (8-inch) diameter ductile iron water main and 17 +/- linear meters (56 linear feet) of 150 mm (6-inch) diameter ductile iron water main including all fittings and appurtenances.
 2. Supply and Installation of vaults for drain valves, gate valves, and air release valves.
 3. Asphalt and concrete pavement repair and replacement.
 4. Traffic control including policing, barricades, signs, warning devices, flaggers, etc.
 5. Installation of sedimentation and erosion control measures per standard including submittal of control plan and obtaining the necessary permits and approval.
 6. Site Restoration and cleanup work.
 7. Perform all site work, utility relocations, and all other work required to complete the project.

END OF SECTION

SECTION 01047

CONTROL OF MATERIALS

PART 1: GENERAL

1.01 APPROVAL OF MATERIALS

- A. Only new materials and equipment shall be incorporated in the Work except where indicated otherwise on the Contract Drawings or directed otherwise by the Project Manager in coordination with KYTC. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the LWC Project Manager and the KYTC representative. No material shall be delivered to the Site without prior approval of the LWC Project Manager and the KYTC representative.
- B. As soon as possible after the Contract has been executed, the Contractor shall submit to the LWC Project Manager through the KYTC resident engineer in conjunction with the KYTC resident engineer, data relating to materials and equipment he proposes to furnish for the Work. Such data shall be in sufficient detail to enable the Project Manager to identify the particular product and to form an opinion as to its conformity to the Specifications.
- C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the LWC Project Manager requires, either prior to beginning or during the progress of the Work, the Contractor shall submit samples of materials for such special tests as may be necessary to demonstrate that they conform to the Specifications. Such samples shall be furnished, stored, packed, and shipped as specified in the General Conditions at the Contractor's expense. Except as otherwise noted, each Contractor will pay for the tests.
- D. The Contractor shall submit data and samples sufficiently early to permit consideration and approval before materials are necessary for incorporation in the Work. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of a claim against the Louisville Water Company or the LWC Project Manager or KYTC and its representative.
- E. When required, the Contractor shall furnish to the Project Manager thru the KYTC resident engineer triplicate sworn copies of manufacturer's shop tests (or reports from independent testing laboratories) relative to materials and equipment performance ratings.
- F. After review of the samples, data and test reports, the materials and equipment used on the Work shall in all respects conform therewith.
- G. If the Work is to be inspected on behalf of the Louisville Water Company during its fabrication, manufacture, or testing, or before shipment, the Contractor shall give notice to the KYTC resident engineer and the Project Manager of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the KYTC resident engineer and sent to the Project Manager in ample time so that the necessary arrangements for the inspection can be made.
- H. In order to demonstrate the proficiency of workmanship or to facilitate the choice among several textures, types, finishes, and surfaces, the Contractor shall provide such samples of workmanship or finish as may be required.

1.02 HANDLING AND STORAGE OF MATERIALS

- A. All materials and equipment to be incorporated in the Work shall be handled and stored by the manufacturer, fabricator, supplier and Contractor before, during, and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft or damage of any kind whatsoever to the material or equipment.
- B. Cement, lime, and grout materials shall be stored under a roof and off the ground and shall be kept completely dry at all times. All miscellaneous reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting.
- C. All mechanical equipment shall be stored in a building to prevent injury. The building may be a temporary structure on the Site or elsewhere, but it must be satisfactory to the Project Manager and to the KYTC resident engineer.
- D. All materials which, in the opinion of the LWC Project Manager, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the Site, and the Contractor shall receive no compensation for the damaged material or its removal.
- E. All pipe and other materials delivered to the job shall be unloaded and placed in a manner which will not hamper the flow of necessary traffic or construction activities.
- F. All machined surfaces and shafting shall be cleaned and protected from corrosion by the proper type and amount of coating necessary to assure protection during shipment and prior to installation.
- G. All equipment requiring special storage or handling such as protection from freezing, moisture and heat shall be clearly marked on the outside of the shipping container.
- H. Storage and demurrage charges by transportation companies and vendors shall be borne by each Contractor.
- I. All deliveries shall be labeled with the Contractor's name and work site.

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. Provide and pay for field engineering services required for project.
 - 1. Survey work required in execution of project.
 - 2. Civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods.
- B. Retain the services of a registered land surveyor licensed in the Commonwealth of Kentucky:
 - 1. Identify existing control points and property line corner stakes indicated on the Drawings, as required.
 - 2. Verify all existing structure locations and all proposed building corner locations, tank locations and equipment locations.
 - 3. Maintain an accurate location of all buried piping 4-in in diameter and larger.

1.02 RELATED WORK

- A. Summary of Work is included in Section 01010.
- B. Project Record Documents are included in Section 01300.

1.03 SUBMITTALS

- A. Submit to the KYTC resident engineer and to the LWC Project Manager the name and address of the registered land surveyor or professional engineer.
- B. On request of the KYTC resident engineer or the LWC Project Manager, submit documentation to verify accuracy of field engineering work.
- C. Submit certificate to the KYTC resident engineer and LWC Project Manager signed by registered engineer or land surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.
 - 1. Certified drawing showing the location, lines and grades in Plan and Profile views of all lines 4-in in diameter and larger buried and exterior to buildings and other buried facilities (e.g. valves, tanks, vaults, etc) installed as a result of the work. This shall be at the same scale as the Engineer's yard piping drawing and submitted on reproducible mylar.
 - 2. Certified survey at the same scale as the Engineer's line drawings (e.g. sewer, force main, water transmission, etc) indicating lines, grades, elevations and stationing at 100-ft increments. Provide elevations of structure bottom, pipe invert(s) and rim elevations on all manholes.

- D. Survey shall include all the requirements as outlined in Paragraph 1.06 below.

1.04 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. Registered professional engineer or land surveyor of the discipline required for the specific service on the project, currently licensed in the Commonwealth of Kentucky.

1.05 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the project are those designated on Drawings.
- B. Locate and protect control points prior to starting site work and preserve all permanent reference points during construction.
 - 1. Make no changes or relocations without prior written notice to the LWC Project Manager and KYTC resident engineer.
 - 2. Report to the LWC Project Manager and KYTC resident engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - 3. Require surveyor to correctly replace project control points which may be lost or destroyed.
 - a. Establish replacements based on original survey control.

1.06 PROJECT SURVEY REQUIREMENTS

- A. Establish one permanent benchmark on site, referenced to data established by survey control points.
 - 1. Record locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Location shall be coordinated with the LWC Project Manager and KYTC resident engineer.
- B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
 - 1. Site improvements
 - a. Stakes for grading, fill and topsoil placement.
 - b. Utility slopes and invert elevations.
 - 2. Batter boards for structures.
 - 3. Building foundation, column locations and floor levels.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- C. From time to time, verify layouts by same methods.

- D. Establish all lines and grades prior to construction of line work for all force mains, raw water mains and transmission mains at 100-ft increments and at defined breaks in grade.

1.07 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses.
- B. Update the project record drawings on a monthly basis based on the work performed during the month ending at the pay request as a condition for approval of monthly progress payment requests.
- C. Maintain an accurate record of piping changes, revisions, and modifications.

PART 2: PRODUCTS (NOT USED)

PART 3: EXECUTION (NOT USED)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1: GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

- A. This Section specifies the general methods and requirements of submissions applicable to Shop Drawings, Product Data, Samples, Construction Photographs, and Construction or Submittal Schedules. Detailed submittal requirements are specified in the technical Sections.
- B. All submittals shall be clearly identified by reference to Section Number, Paragraph, Drawing Number or Detail as applicable. Submittals shall be clear and legible and of sufficient size for presentation of data.

1.02 SHOP DRAWINGS, PRODUCT DATA, SAMPLES

- A. Shop Drawings
 - 1. Shop drawings as specified in individual Sections include, custom-prepared data such as fabrication and erection/installation (working) drawings, scheduled information, setting diagrams, actual shopwork manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the work.
 - 2. All shop drawings submitted by subcontractors shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
 - 3. Check all subcontractor's shop drawings regarding measurements, size of members, materials and details to make sure that they conform to the intent of the Drawings and related Sections. Return shop drawings found to be inaccurate or otherwise in error to the subcontractors for correction before submission thereof.
 - 4. All details on shop drawings shall show clearly the relation of the various parts to the main members and lines of the structure and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the drawings before being submitted.
 - 5. Submittals for equipment specified under this Contract shall include a listing of all installations where identical or similar equipment has been installed and been in operation for a period of at least one year.

B. Product Data

1. Product data as specified in individual Sections include, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the work.

C. Samples

1. Samples specified in individual Sections include, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Louisville Water Company for independent inspection and testing, as applicable to the work.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
 1. Field measurements
 2. Field construction criteria
 3. Catalog numbers and similar data
 4. Conformance with related Sections
- B. Each shop drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements." Shop drawings and product data sheets 11-inches x 17-inches and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Resident Project Representative a copy of each transmittal sheet for shop drawings, product data and samples at the time of submittal to the LWC Project Manager. Shop Drawings that are not stamped will not be reviewed.

- C. The Contractor shall utilize a 10-character submittal identification numbering system in the following manner:
1. The first character shall be a D, S, P, M, or R, which represents Shop/Working Drawing and other Product Data (D), Sample (S), Preliminary Submittal (P), Operating/Maintenance Manual (M), or Request for Information (R).
 2. The next five digits shall be the applicable Section Number.
 3. The next three digits shall be the numbers 001 to 999 to sequentially number each initial separate item or drawing submitted under each specific Section Number.
 4. The last character shall be a letter, A to Z, indicating the submission, or resubmission of the same Drawing, i.e., "A=1st submission, B=2nd submission, C=3d submission, etc. A typical submittal number would be as follows:

D-03300-008-B

D. = Shop Drawing
03300 = Section for Concrete
008 = The eighth initial submittal under this section
B. = The second submission (first resubmission) of that particular shop drawing

- D. Notify the LWC Project Manager and the KYTC Resident Engineer in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.
- E. The review and approval of shop drawings, samples or product data by the LWC Project Manager shall not relieve the Contractor from the responsibility for the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the LWC Project Manager will have no responsibility therefor.
- F. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Louisville Water Company will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- G. Project work, materials, fabrication, and installation shall conform with approved shop drawings, applicable samples, and product data.
- H. The Contractor shall use green ink for all submittals.

1.04 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the Work or in the work of any other contractor.
- B. Each submittal, appropriately coded, will be returned within 28 calendar days following receipt of submittal by the LWC Project Manager.

- C. Number of submittals required:
 - 1. Shop Drawings: Six copies.
 - 2. Product Data: Three copies.
 - 3. Samples: Submit the number stated in the respective Sections.

- D. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The Project title and number.
 - 3. Contractor identification.
 - 4. The names of:
 - a. Contractor
 - b. Supplier
 - c. Manufacturer
 - 5. Identification of the product, with the section number, page and paragraph(s).
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Applicable standards, such as ASTM or Federal Standards numbers.
 - 9. Identification of deviations from Contract Documents.
 - 10. Identification of revisions on resubmittals.
 - 11. A blank space suitably sized for Contractor and Project Manager stamps.
 - 12. Where calculations are required to be submitted by the Contractor, the calculations shall have been checked by a qualified individual other than the preparer. The submitted calculations shall clearly show the names of the preparer and of the checker.

1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

- A. The review of shop drawings, data and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:
 - 1. as permitting any departure from the Contract requirements;
 - 2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
 - 3. as approving departures from details furnished by the LWC Project Manager, except as otherwise provided herein.

- B. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.
- C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which LWC Project Manager finds to be in the interest of the Louisville Water Company and to be so minor as not to involve a change in Contract Price or Contract Time, the LWC Project Manager may return the reviewed drawings without noting an exception.
- D. Submittals will be returned to the Contractor under one of the following codes.

Code 1 - "APPROVED" is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.

Code 2 - "APPROVED AS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.

Code 3 - "APPROVED AS NOTED/CONFIRM". This combination of codes is assigned when a confirmation of the notations and comments IS required by the Contractor. The Contractor may, at his own risk, release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. This confirmation shall specifically address each omission and nonconforming item that was noted. Confirmation is to be received by the Project Manager within 15 calendar days of the date of the Project Manager's transmittal requiring the confirmation.

Code 4 - "APPROVED AS NOTED/RESUBMIT". This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package. This resubmittal is to address all comments, omissions and non-conforming items that were noted. Resubmittal is to be received by the Project Manager within 15 calendar days of the date of the Project Manager's transmittal requiring the resubmittal.

Code 5 - "NOT APPROVED" is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.

Code 6 - "COMMENTS ATTACHED" is assigned where there are comments attached to the returned submittal which provide additional data to aid the Contractor.

Code 7 - "RECEIPT ACKNOWLEDGED" – This code is assigned to acknowledge receipt of a submittal that is not subject to the Project Manager's review and approval; and, is being filed for informational purposes only. This code is generally used in acknowledging receipt of *means and methods of construction* work plan, field conformance test reports, and Health and Safety plans.

Codes 1 through 5 designate the status of the reviewed submittal with Code 6 showing there has been an attachment of additional data.

- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall identify all revisions made to the submittals, either in writing on the letter of transmittal or on the shop drawings by use of revision triangles or other similar methods. The resubmittal shall clearly respond to each comment made by the LWC Project Manager on the previous submission. Additionally, the Contractor shall direct specific attention to any revisions made other than the corrections requested by the LWC Project Manager on previous submissions.
- F. Partial submittals may not be reviewed. The LWC Project Manager will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor and will be considered "Not Approved" until resubmitted. The LWC Project Manager may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.
- G. Repetitive Review
 - 1. Shop drawings and other submittals will be reviewed no more than twice at the Louisville Water Company's expense. All subsequent reviews will be performed at times convenient to the LWC Project Manager and at the Contractor's expense, based on the LWC Project Manager's then prevailing rates. The Contractor shall reimburse the Louisville Water Company for all such fees. Submittals are required until approved.
 - 2. Any need for more than one resubmission, or any other delay in obtaining LWC Project Manager's review of submittals, will not entitle Contractor to extension of the Contract Time.
- H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the LWC Project Manager at least thirty (30) calendar days prior to release for manufacture.
- I. When the shop drawings have been completed to the satisfaction of the LWC Project Manager, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the LWC Project Manager via the KYTC Resident Engineer.

1.06 DISTRIBUTION

- A. Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the LWC Project Manager. Number of copies shall be as directed by the LWC Project Manager but shall not exceed six to the LWC Project Manager and two to the KYTC Resident Engineer.

1.07 CONSTRUCTION PHOTOGRAPHS / PRE-CONSTRUCTION VIDEO

- A. The Contractor shall have an average of 24 color photographs per month made of the work during its progress and 24 color photographs of the completed facilities. The photographs shall be of such views and taken at such times as the LWC Project Manager directs.
- B. All photographic work shall be accomplished through the use of a digital camera. Provide original CD's to the Louisville Water Company and to the KYTC Resident Engineer.
- C. Prior to the initiation of any construction activities, the Contractor, as directed by the Project Manager, shall video the entire length of the pipeline route as directed by the Project Manager to document existing conditions. The original of the DVD shall be released to the Louisville

Water Company. The Contractor shall also provide two (2) copies of the DVD to the Project Manager and two (2) copies to the KYTC Resident Engineer.

1.08 GENERAL PROCEDURES FOR SUBMITTALS

- A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work of other related Sections, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

1.09 RECORD DRAWINGS

- A. The Record Drawings shall consist of annotated (in ink) Contract Drawings and the approved Shop Drawings and shall be submitted to the LWC Project Manager and the KYTC Resident Engineer at any time upon request during construction. The Record Drawings shall also be prepared in reproducible form (3 mil Mylar) and shall be submitted to the LWC Project Manager and the KYTC Resident Engineer upon completion of the construction. The Contractor will be furnished AutoCAD CD's of the Contract Drawings in Version 2010 for preparation of the Record Drawings.
- B. Contract Drawings shall be legibly marked to record actual construction including:
 - 1. All deviations in location or elevation of any underground installation from that shown on the Contract Drawings.
 - 2. Any significant changes in above ground installations from approved Shop Drawings or Contract Drawings.
 - 3. No such deviations from the Contract Drawings or approved Shop Drawings shall be made without approval by the LWC Project Manager and the KYTC Resident Engineer.
 - 4. Actual location and depth of all installed below grade conduit and piping not specifically showed on the Contract Drawings.
- C. Specifications and addenda shall be legibly marked up to record:
 - 1. Manufacturer, trade name, catalog number, and Supplier of each product and item of equipment actually installed.
 - 2. Changes made by Change Order or Field Order.
 - 3. Other matters not originally specified.
- D. Shop Drawings shall be legibly annotated to record changes made after review.
- E. In addition to the 3 mil mylar Record Drawings, and annotated Contract Drawings and Shop Drawings, the Contractor shall also furnish AutoCAD CD's of the Record Drawings in Version 2010.

1.10 SCHEDULES (CONSTRUCTION SCHEDULE, SCHEDULE OF SUBMITTALS, AND SCHEDULE OF VALUES)

- A. Within 14 calendar days after the effective date of the Contract is issued, the Contractor shall submit to the Project Manager via the KYTC Resident Engineer for review:
 1. A preliminary progress schedule (Construction Schedule) indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any milestones specified in the Contract Documents. Refer to Specification Section 01311.
 2. The Contractor shall submit preliminary schedule of Shop Drawing and Sample Submittals (Schedule of Submittals) which will list each required submittal and the times for submitting, reviewing and processing such submittals. The Schedule of Submittals shall be listed in order of specification section and by the 10-digit submittal identification number.
 3. The Contractor shall submit preliminary Schedule of Values for all of the Work which will include quantities.

1.11 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

- A. If specifically required in other Sections of these Specifications, the Contractor shall submit a P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

END OF SECTION

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State of _____ and that he/she has been employed by (Name of Contractor) _____ to design _____ in accordance with Specification Section _____ for the _____. The undersigned further certifies that he/she has performed the design of the _____, that said design is in conformance with all applicable local, state and federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the Louisville Water Company's representative within seven days following written request therefore by the Louisville Water Company.

Area below designated for P.E. stamp:

P.E. Name

Signature

Address

Contractor's Name

Signature

Title

Address

SECTION 01445

PIPELINE TESTING AND CLEANING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and test and clean all new pipelines installed under this Contract as specified herein, including chlorination of all potable waterlines.

1.02 RELATED WORK

- A. Buried pipelines are included in Division 2.

PART 3 EXECUTION

3.01 GENERAL

- A. Furnish all necessary equipment and labor for cleaning, testing and chlorinating the pipelines. The procedures and methods shall be approved by the LWC Project Manager.
- B. Make any taps and furnish all necessary caps, plugs, valves, fittings, etc., as required in conjunction with testing pipelines. Furnish a test pump, gauges and any other equipment required in conjunction with carrying out the hydrostatic tests.

3.02 CLEANING PIPELINES

- A. As pipe laying progresses and at the conclusion of the work thoroughly clean all new pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood or other material which may have entered during the construction period. If, after this cleaning, obstructions remain, they shall be removed.

3.03 TESTING

A. General

1. Conduct pressure and leakage tests on all newly installed pipelines. Furnish all necessary equipment and material and make all taps in the pipe, as required. The LWC Project Manager and the KYTC representative will monitor the tests.
2. Unless otherwise noted, test pressures shall be as specified below:

Hydrostatic Test Pressure (1 Hour)
4-24 Inch Line – 200 psi

Leakage Test Pressure (2 Hours)
4-24 Inch Line – 200 psi

3. New pipelines which are to be connected to existing pipelines shall be tested by isolating the new pipe with grooved end pipe caps, spectacle blinds, or blind flanges.

4. Conduct final acceptance tests on buried piping that is to be hydrostatically tested after the trench has been completely backfilled. The Contractor may, if field conditions permit, as determined by the LWC Project Manager and the KYTC Resident Engineer, partially backfill the trench and leave the joints open for inspection and conduct an initial service leak test. The acceptance test shall not, however, be conducted until all backfilling has been completed.

B. Hydrostatic Leak Tests

1. Furnish the following equipment for the hydrostatic tests:

<u>Amount</u>	<u>Description</u>
2	Approved graduated containers.
2	Pressure gauges.
1	Hydraulic force pump approved by the LWC Project Manager. Suitable hose and suction pipe as required.

2. Water shall be used as the hydrostatic test fluid unless otherwise specified. Test water shall be clean and shall be of such quality as to minimize corrosion of the materials in the piping system. Test water shall be acquired from a source as designated by the LWC Project Manager.
3. Vents at all high points of the piping system shall be opened to purge air pockets while the piping system is filling. Venting during the filling of the system also may be provided by the loosening of flanges having a minimum of four bolts or by the use of equipment vents.
4. All parts of the piping system shall be subjected to test pressure specified hereinbefore.
5. Piping
 - a. Where any section of pipe is provided with concrete thrust blocking, do not make the pressure test until at least 4 days have elapsed after the thrust blocking is installed. If high-early cement is used for thrust blocking, the time may be reduced to 2 days.
 - b. When testing cement-mortar lined piping, slowly fill the section of pipe to be tested with water and allow to stand for 24 hours under slight pressure to allow the cement-mortar lining to absorb water.
 - c. Expel all air from the piping system prior to testing and apply and maintain the specified test pressure by means of the hydraulic force pump. Valve off the piping system when the test pressure is reached and conduct the pressure test for 2 hours, reopening the isolation valve only as necessary to restore the test pressure. The pump suction shall be in a barrel or similar device, or metered so that the amount of water required to maintain the test pressure may be measured accurately. This measurement represents the leakage, which is defined as the quantity of water necessary to maintain the specified test pressure for the duration of the test period.
6. No pipe installation will be accepted if the leakage is greater than the number of gallons per hour as determined by the following formula:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

In this formula:

- L = Allowable leakage, in gallons per hour.
- S = Length of pipe tested in feet.
- D = Nominal diameter of pipe, in inches.
- P = Average test pressure during the leakage test, in pounds per square inch.

7. The Contractor shall correct any leakage greater than the allowance determined under this formula at no additional cost to the KYTC or LWC.

C. Initial Service Leak Tests

1. Equipment used for initial service leak testing may be the same as that specified under HYDROSTATIC LEAK TESTS hereinbefore, or the pump connected to the piping system.
2. The initial system leak test shall be performed by gradually bringing the piping system up to normal operating pressure and holding it there continuously for a minimum time of 10 minutes. Examination for leakage shall be made at all joints and connections. The piping system, exclusive of possible localized instances at pump or valve packing, shall show no visual evidence of weeping or leaking. Any visible leakage shall be corrected at no additional cost.

D. Test Records

1. Records shall be made of each piping system installation during the test. These records shall include:
 - a. Date of test.
 - b. Description and identification of piping tested.
 - c. Test fluid.
 - d. Test pressure.
 - e. Remarks, to include such items as:
 - (1) Leaks (type, location).
 - (2) Repairs made on leaks.
 - f. Certification by Contractor and initialed acknowledgment by the LWC Project Manager, copies of which are to be provided to the KYTC Resident Engineer.

3.04 INTERIM CLEANING

- A. Care shall be exercised during fabrication to prevent the accumulation of weld rod, weld spatter, pipe cuttings and fillings, gravel, cleaning rags, etc. within piping sections. All piping shall be examined to assure removal of these and other foreign objects prior to assembly. Shop cleaning may employ any conventional commercial cleaning method if it does not corrode, deform, swell, or otherwise alter the physical properties of the material being cleaned.

3.05 CHLORINATION OF PIPELINES

- A. Piping shall be cleaned and disinfected in compliance with all applicable sections of AWWA Standard C-651. All interior surfaces of pipelines shall be exposed to a minimum 50 PPM chlorine solution for a minimum of 24 hours, after which the lines can be cleaned and flushed provided a 25 PPM residual is maintained after the 24 hour period. The lines shall be flushed clean until the chlorine concentration in the water leaving the lines 1-2 PPM. Chlorine solution with a higher residual may remain in the line, without flushing, if approved by the LWC Project Manager.
- B. During installation, the interior of all pipe, fittings and other accessories shall be kept as free as possible from dirt and foreign matter at all times. If, in the opinion of the LWC Project Manager, the pipe contains dirt or foreign matter that could not be removed during the flushing operation, the interior of the pipe will be cleaned and swabbed with a bactericidal solution. When pipe laying is not in progress, the open ends of pipe shall be sealed with watertight plugs.
- C. After the completion of hydrostatic pressure tests and prior to disinfection, the pipeline shall be flushed, as thoroughly as possible with the water pressure and outlets available. If feasible, flushing rate should develop a velocity in the pipeline of at least 2.5 fps. Since it is usually difficult to secure this minimum velocity in pipelines over 16 in. in diameter, the requirements of Paragraph 3.02 A.1 above shall be rigidly enforced for the larger sizes of pipe. The minimum quantity of water used for flushing shall be in excess of the storage capacity of the pipeline, to insure that clean water has traversed the entire length of the line.
- D. After flushing has been completed to the point that all apparent dirt and foreign matter have been removed from the pipeline, either liquid chlorine or calcium hypochlorite solution shall be injected into the pipeline as provided in AWWA Standard C-601.
- E. Following chlorination, all treated water shall be flushed from the newly laid pipeline at its extremities until the replacement water throughout its length is proved by test to be: a) comparable in quality to the water served the public from the existing water supply system, or b) as approved by the LWC Project Manager. The satisfactory quality of water delivered by the new pipeline shall continue for a period of at least two days. Samples will be taken from a tap located and installed in such a way as to prevent outside contamination. Unless otherwise directed, the sample tap shall either be a hose bib, a disconnected service tap or a ¾ copper riser (with stop-cock), which shall be provided by the Contractor. Should the initial treatment fail to achieve the satisfactory quality described above, the original chlorination procedure shall be repeated until satisfactory results are obtained. All testing shall be performed by the Contractor.
- F. Special disinfecting procedures shall be used in connections to existing pipelines and where the method outlined above is not practical.

3.06 LABORATORY TESTING

- A. The Contractor shall be responsible for all coordination and payment of testing required under this specification section. Within thirty (30) calendar days after Notice-to-Proceed, the Contractor shall furnish the name of the Laboratory proposed to perform the testing as required by this specification section. The testing Laboratory shall be approved/certified by the Commonwealth of Kentucky for this type of testing and is subject to the approval of the LWC Project Manager.

3.07 DISPOSAL OF CHLORINATED WATER

- A. The Contractor will not be permitted to discharge chlorinated or dechlorinated water to the sanitary sewer system. The Contractor shall be responsible for treatment and disposal of chlorinated water in accordance with all Local, State, and Federal Regulations. The Contractor shall be responsible for obtaining all discharge permits from the Kentucky Division of Water, Corps of Engineers, and any other regulatory entity as required for legal disposal of water generated from the disinfection process.

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.

1.02 RELATED WORK

- A. Refer to Conditions of Contract for the general requirements relating to warranties and bonds.
- B. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections.
- C. Certifications and other commitments and agreements for continuing services to Louisville Water Company are specified elsewhere in the Contract Documents.

1.03 SUBMITTALS

- A. Submit written warranties to the Louisville Water Company for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Louisville Water Company.
- B. When a designated portion of the Work is completed and occupied or used by the Louisville Water Company, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Louisville Water Company within fifteen days of completion of that designated portion of the Work.
- C. When a special warranty is required to be executed by the respective Contractor, or the respective Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Louisville Water Company for approval prior to final execution.
- D. Refer to individual Specification Sections for specific content requirements, and particular requirements for submittal of special warranties.
- E. At Final Completion compile two copies of each required warranty and bond properly executed by the respective Contractor, or by the respective Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the Table of Contents of the Project Manual.

- F. Bind warranties and bonds in heavy-bond, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½-in by 11-in paper.
- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification Section in which specified, and the name of the product or work item.
- H. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer, supplier and manufacturer.
- I. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name, address and telephone number of the responsible principal.
- J. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.04 WARRANTY REQUIREMENT

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The respective Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Louisville Water Company has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Louisville Water Company's Recourse: Written warranties made to the Louisville Water Company are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Louisville Water Company can enforce such other duties, obligations, rights, or remedies.
- E. Rejection of Warranties: The Louisville Water Company reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. The Louisville Water Company reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the

Work, until evidence is presented that entities to countersign such commitments are willing to do so.

- G. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the respective Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the respective Contractor.

1.05 DEFINITIONS

- A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Louisville Water Company.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Louisville Water Company.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform all excavation, backfill, fill and grading required completing the work as shown on the Drawings and as specified herein. The work shall include, but not necessarily be limited to; excavation for structures, footings, manholes, vaults, electrical manholes, handholes, conduits, cables, raceways and ducts, pipes and paving; all backfilling and fill; embankment and grading; disposal of waste and surplus materials; and all related work such as sheeting, bracing and pumping.
- B. All excavation, trenching and related sheeting, bracing, etc., shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P). Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- C. Loam, if any, excavated under this Section may be salvaged by the Contractor for his/her own convenience for use as specified under Section 02933.
- D. Provide the services of licensed professional Engineer, registered in the Commonwealth of Kentucky, to prepare temporary excavation support system designs and submittals.

1.02 RELATED WORK

- A. Trenching, Backfilling and Compaction in Section 02221.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager and the KYTC Resident Engineer, in accordance with Section 01300, the following and as elsewhere specified in this Section:
 - 1. Submit certificates of compliance for all materials.
 - 2. Submit to the LWC Project Manager and the KYTC Resident Engineer, in accordance with Section 01300, the proposed methods of construction, including excavation, excavation support systems designs, backfilling and filling and compaction for the various portions of the work. Excavation support system designs shall be prepared by a licensed professional engineer, registered in the Commonwealth of Kentucky, having a minimum of 5 years of professional experience in the design and construction of excavation support systems. Design calculations and drawings will be submitted for record purposes only. Contractor shall remain responsible for adequacy and safety of construction means, methods, and techniques.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C33 – Specification for Concrete Aggregates.

2. ASTM D698 – Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/f (600kN-m/m)
3. ASTM D2487 – Standard Classification of Soils for Engineering Purposes.
4. ASTM D2922 – Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (shallow depth).
5. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
6. ASTM D3017 – Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (shallow depth).
7. ASTM D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 PROTECTION

A. Sheeting and Bracing

1. Furnish, put in place and maintain such sheeting and bracing as may be required: by Federal, State and local safety requirements; to support the sides of excavations; to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction; and to protect adjacent structures from undermining or other damage. If the LWC Project Manager or the KYTC Resident Engineer is of the opinion that at any points sufficient or proper supports have not been provided, he/she may order additional supports put in, and compliance with such order shall not relieve or release the Contractor from his/her responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed. Where soil cannot be properly compacted to fill a void, lean concrete shall be used as backfill.
2. Construct the sheeting outside the neat lines of the foundation, unless indicated otherwise, to the extent deemed desirable for the method of operation. Sheeting shall be plumb and securely braced and tied in position. Sheeting and bracing shall be adequate to withstand all pressures to which the structure or trench will be subjected. Any movement or bulging which may occur shall be corrected to provide the necessary clearances and dimensions.
3. Where sheeting and bracing is required to support the sides of excavations for structures, engage a professional engineer, registered in the Commonwealth of Kentucky, to design the sheeting and bracing. The sheeting and bracing installed shall be in conformity with the design and certification of this shall be provided by the professional engineer. Submit P.E. Certification Form contained in Section 01300 to show compliance with this requirement.
4. Leave in place to be embedded in the backfill all sheeting and bracing not shown on the Drawings but which the LWC Project Manager or the KYTC Resident Engineer may direct in writing to leave in place at any time during the progress of the work for the purpose of preventing injury to structures, utilities, or property, whether public or private. The LWC Project Manager or the KYTC Resident Engineer may direct that timber used for sheeting and bracing be cut off at any specified elevation. Sheeting directed by the LWC Project

Manager or the KYTC Resident Engineer to be left in place will be paid for in accordance with Article 11 of the General Conditions. Payment for sheeting shown on the Drawings to be left in place will be included in the Base Bid. All timber sheeting to be left in place within the limits of the structure shall be treated.

5. All sheeting and bracing not left in place shall be carefully removed in such manner as not to endanger the construction or other structures, utilities, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, or otherwise as may be directed.
6. The right of the LWC Project Manager or the KYTC Resident Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his/her part to issue such orders and his/her failure to exercise his/her right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.
7. No sheeting is to be withdrawn if driven below mid-diameter of any pipe and under no circumstances shall any sheeting be cut off at a level lower than 1 foot above the top of any pipe.

B. Pumping and Drainage

1. At all times during construction provide and maintain proper equipment and facilities to remove all water entering excavations and keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fills, structures or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural levels. Submit to the LWC Project Manager via the KYTC Resident Engineer for review the design of the dewatering systems prior to commencing work.
2. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation. Well or sump installations shall be constructed with proper sand filters to prevent drawing of finer grained soil from the surrounding ground.
3. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps and pumped from the excavation to maintain a bottom free from standing water.
4. Take all additional precautions to prevent uplift of any structure during construction.
5. Drainage shall be disposed of in an approved area only so that flow or seepage back into the excavated area will be prevented, as will saturation of soils on hillsides or slopes.
6. Flotation shall be prevented by maintaining a positive and continuous operation of the dewatering system. Be fully responsible and liable for all damages which may result from failure of this system.
7. Remove the dewatering equipment after the system is no longer required.
8. Take all necessary precautions to preclude the accidental discharge of fuel, oil, etc., in order to prevent adverse effects on groundwater quality.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Common Fill shall consist of mineral soil substantially free from organic materials, loam, wood, trash and other objectionable materials which may be compressible or which cannot be properly compacted. Common fill shall not contain limestone fragments larger than 6 inches in thickness and 12 inches in diameter. Common fill shall not contain granite blocks, broken concrete, masonry rubble or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling. Snow, ice and frozen soil will not be permitted.
- B. Select Common Fill shall be as specified above for Common Fill except that the material shall contain no stones larger than 2 inches in largest dimension.
- C. Riprap used for slope protection shall be sound, durable rock which is roughly rectangular shape and of suitable quality to ensure permanence in the condition in which it is to be used. Rounded stones, boulders, sandstone or similar soft stone will not be acceptable. Material shall be free from overburden, spoil, shale and organic material, meet the LWC Project Manager's and the KYTC Resident Engineer approval and be well graded within the following limits:

<u>Weight of Stone</u>	<u>Percent Finer by Weight</u>
100 lb	100
60 lb	90
25 lb	50
2 lb	10

D. Crushed Stone

- 1. When referred to in these Specifications crushed stone shall be Kentucky Department of Transportation SPR Number 57.
- 2. When referred to in these Specifications dense graded aggregate (DGA) shall be crushed stone classified by the Kentucky Department of Transportation and conforming to the following requirements:

<u>Sieve Size</u>	<u>% Passing</u>
1-in	100
3/4-in	70 to 100
3/8-in	50 to 80
No. 4	35 to 65
No. 10	20 to 50
No. 40	10 to 30
No. 200	5 to 12

F. Screened Gravel

- 1. Screened gravel shall consist of hard, durable, rounded or subangular particles of proper size and gradation and shall be free from sand, loam, clay, excess fines and deleterious materials. The gravel shall be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
5/8-in	100
1/2-in	40 to 100
3/8-in	15 to 45
No. 10	0 to 5

G. Sand

1. Sand shall conform to ASTM C33 for fine aggregate.

H. Erosion Control Blanket

1. Erosion control blanket shall be used as indicated on the Drawings and shall conform to the following requirements:
 - a. Minimum grab strength of 120 lbs per ASTM D1682.
 - b. Apparent opening size to be equal to or greater than the U.S. Standard Sieve No. 100 (0.210 mm) per ASTM D4751.
 - c. Percent open area not to exceed about 25%. The percent open area is defined as the ratio of the sum of 20 or more individual open areas (times 100) to the sum of the corresponding 20 or more individual total areas.
 - d. Coefficient of permeability shall not be less than 0.2 cm/sec.
 - e. Erosion control blanket shall be Mirafi, Type 140N; Dupont, Type PAR, Style 3401 or equal product by Amoco.

PART 3 EXECUTIONS

3.01 EXCAVATION BELOW GRADE

- A. If the bottom of any excavation is taken out below the limits shown on the Drawings, specified, or directed by the LWC Project Manager or the KYTC Resident Engineer, it shall be refilled at the Contractor's expense with concrete, 8 inch layers of compacted structural fill or other material satisfactory to the LWC Project Manager and the KYTC Resident Engineer. The type of material to be used shall be at the LWC Project Manager's and the KYTC Resident Engineer's option.
- B. If care is not taken for controlling water properly, through failure to postpone final excavation immediately above the subgrade until shortly before placing of the new work thereon, or other failure or neglect to conduct the excavation work properly so that the surface of the subgrade is in proper condition for construction, remove the unsuitable material and replace it with concrete, compacted structural fill, or other approved material at Contractor's own expense so that the condition of the subgrade meets with the approval of the LWC Project Manager and the KYTC Resident Engineer before any work is placed thereon.
- C. If, in the opinion of the LWC Project Manager and the KYTC Resident Engineer, the material, in its undisturbed natural condition, at or below the normal grade of the excavation as indicated on the Drawings is unsuitable for foundations, it shall be removed to such depth and width as he/she may direct and be replaced with suitable material as directed by the LWC Project

Manager and the KYTC Resident Engineer for which compensation will be made per the General and Supplementary Conditions.

3.02 STRUCTURE EXCAVATION

- A. Excavation shall be made to the grades shown on the Drawings and to such widths as will give suitable room for construction of the structures, for bracing and supporting, pumping and draining. The bottom of the excavations shall be rendered firm and dry and in all respects acceptable to the LWC Project Manager and the KYTC Resident Engineer.
- B. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. Exposed subgrades shall be proof rolled with at least two coverage of the specified equipment. The LWC Project Manager and the KYTC Resident Engineer may waive this requirement if, in his/her opinion, the subgrade will be rendered unsuitable by such compaction. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering, proof rolling, or other construction methods shall be removed and replaced by structural fill as required by the LWC Project Manager and the KYTC Resident Engineer at the Contractor's expense.
- C. Dewatering shall be such as to prevent boiling or detrimental under seepage at the base of the excavation as specified herein.
- D. Excavation equipment shall be satisfactory for carrying out the work in accordance with the requirements specified. In no case shall the earth be ploughed, scraped, or dug with machinery so near to the finished subgrade as to result in excavation of, or disturbance of material below grade, the last of the excavated material being removed with pick and shovel just before placing of concrete or working mat thereon.
- E. When excavation for foundations has reached prescribed depths, the LWC Project Manager and the KYTC Resident Engineer shall be notified and will inspect conditions. If materials and conditions are not satisfactory to the LWC Project Manager or the KYTC Resident Engineer, the LWC Project Manager or the KYTC Resident Engineer will issue instructions as to the procedures and if additional costs are involved, a change order will be processed in accordance with KYTC standard specifications.
- F. During final excavation to subgrade level, take whatever precautions are required to prevent disturbance and remolding. Material which has become softened and mixed with water shall be removed. Hand excavation of the final 3 to 6 inches will be required as necessary to obtain a satisfactory undisturbed bottom. The LWC Project Manager and the KYTC Resident Engineer will be the judges as to whether the work has been accomplished satisfactorily.

3.03 MISCELLANEOUS EXCAVATION

- A. Perform all the remaining miscellaneous excavation. Make all excavations necessary to permit the placing of loam and plants, for constructing roadways and any other miscellaneous earth excavation required under this Contract.

3.04 BACKFILLING – COMMON FILL

- A. Common Fill may be used as trench backfill; fill against exterior walls of structures (except water and retention structures) as indicated on the Drawings; as embankment fill; or in other areas as designated by the LWC Project Manager and the KYTC Resident Engineer. Material conforming to the requirements of common fill shall be placed in layers having a maximum thickness of 8 inches measured before compaction.

- B. Common Fill shall be compacted to at least 95% of maximum density as determined by ASTM D1557, D698.
- C. Materials placed in fill areas shall be deposited to the lines and grades shown on the Drawings making due allowance for settlement of the material and for the placing of loam thereon.
- D. No compacting shall be done when the material is too wet either from rain or from excess application of water. At such times, work shall be suspended until the previously placed and new materials have dried sufficiently to permit proper compaction.
- B. Common fill shall not be placed on a frozen surface or one covered by snow or ice, nor shall snow, ice or frozen material be incorporated into the compacted fill.

3.05 BACKFILLING - STRUCTURAL FILL

- A. Structural fill shall be placed in loose layers having a maximum thickness of 8 inches in open areas and 6 inches in confined areas including points where conduit and piping join structures, measured before compaction. Except for the 12 inches of structural fill placed beneath pavements, each layer of fill shall be compacted to at least 95% of maximum dry density determined by the ASTM D698 by methods approved by the LWC Project Manager and the KYTC Resident Engineer. The upper 12 inches of structural fill beneath pavement shall be compacted to 100% of the maximum dry density at moisture contents within 2% of the optimum value (ASTM D698). The limits of structural fill adjacent to structures shall extend as shown on the Drawings.
- B. Structural fill shall not be placed on a frozen surface or one covered by snow or ice, nor shall snow, ice or frozen earth be incorporated in the compacted fill.
- C. Compaction of structural fill in open areas shall consist of a heavy vibratory roller, or any method approved by the LWC Project Manager and the KYTC Resident Engineer. Compaction of structural fill in confined areas shall be accomplished by hand operated vibratory equipment or mechanical tampers approved by the LWC Project Manager and the KYTC Resident Engineer. As a minimum, compaction of structural fill shall consist of four coverage of the approved equipment.
- D. Working mat is required below all structures, as indicated on the Drawings; it shall consist of structural fill (12 inch minimum).

3.06 EARTH EMBANKMENTS-COMMON FILL

- A. All organic materials, including peat and loam, and loose inorganic silt material (loess) shall be removed from areas beneath new embankments and reconstructed slopes. If the subgrade slopes exceed 10 feet horizontal to 1 foot vertical, the subgrade shall be stepped to produce stable horizontal surfaces for the placement of the embankments or reconstructed slopes. The natural subgrade shall then be compacted to at least 95% of the maximum dry density at moisture contents within 2% below to 7% above the optimum moisture content (ASTM D698) by at least two coverage of a loaded six-wheel or ten-wheel truck. The LWC Project Manager and the KYTC Resident Engineer will waive this requirement, if, in his/her opinion, the subgrade will be rendered unstable by such compaction. The prepared subgrade shall be inspected and approved by the LWC Project Manager and the KYTC Resident Engineer prior to the placement of fill. If groundwater seepage or springs are encountered in the excavated horizontal steps, drainage shall be provided as directed by the LWC Project Manager and the KYTC Resident Engineer.

3.07 DISPOSAL OF SURPLUS MATERIAL

- A. No excavated materials shall be removed from the site of the work or disposed of, except as specified by the LWC Project Manager and the KYTC Resident Engineer. Materials shall be neatly piled so as to inconvenience as little as possible the public and adjoining property owners until used or otherwise disposed of as specified below.
- B. Suitable excavated material shall be used for fill embankments or backfill on the different parts of the work as required.
- C. Surplus fill shall become the property of the Contractor and shall be removed and disposed off site.

3.08 DISPOSAL AND REPLACING OF ROCK

- A. Remove and dispose of all pieces of ledge and boulders which are not suitable for use in other parts of the work. Rock disposed of by hauling away to spoil areas is to be replaced by approved surplus excavation obtained elsewhere on the work, insofar as it is available. Any deficiency in the backfill material shall be made up with acceptable material approved by the LWC Project Manager and the KYTC Resident Engineer.
- B. Fragments of ledge and boulders smaller than 50 lb. weight may be used in backfilling trenches unless in the opinion of the LWC Project Manager and the KYTC Resident Engineer the quantity is excessive, in which case he/she may order the removal and disposal of some of this rock. The small pieces of rock used as backfill shall not be placed in trenches until the pipe has at least 2 feet of earth over it. Place these pieces of stone in thin layers alternating them with earth to be sure that all voids between the stones are completely filled with earth to prevent the occurrence of voids and settlement which will result therefrom.
- C. Rock may be used in embankment fill only with the approval of the LWC Project Manager and the KYTC Resident Engineer.

3.09 GRADING

- A. Grading in preparation for placing of loam, planting areas, paved walks and drives and appurtenances shall be performed at all places that are indicated on the Drawings, to the lines, grades and elevations shown and otherwise as directed by the LWC Project Manager and the KYTC Resident Engineer and shall be performed in such a manner that the requirements for formation of embankments can be followed. All material encountered, of whatever nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, the subgrade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the prosecution or condition of the work.
- B. If at the time of grading it is not possible to place any material in its final location, it shall be stockpiled in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.
- C. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses, in order to obtain satisfactory construction.
- D. Stones or rock fragments larger than 4 inches in their greatest dimensions will not be permitted in the top 6 inches of the finished subgrade of all fills or embankments.

- E. In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as directed by the LWC Project Manager and the KYTC Resident Engineer.

3.10 EROSION CONTROL BLANKET

- A. Erosion control blankets shall be installed on slopes prior to the installing of riprap as directed by the LWC Project Manager and the KYTC Resident Engineer in accordance with manufacturer's instructions. The area to be covered shall be properly prepared, before the blanket is applied. When the blanket is unrolled, the netting shall be on top and the fibers in contact with the soil over the entire area. The blankets shall be butted snugly at the ends and side and stapled. Blankets shall be placed a minimum of three rows (of four foot) wide (total 12 foot width) and stapled together in accordance with manufacturer's instructions. The staples shall be made of wire, 0.091 inches in diameter or greater, "U" shaped with legs 6 inches in length and a 1 inch crown. The staples shall be driven vertically into the ground, spaced approximately two linear yards apart, on each side, and one row in the center alternately spaced between each side. Adjoining blankets shall not be overlapped and shall utilize a common row of staples to attach.

3.11 RIPRAP FOR SLOPE PROTECTION

- A. Unless otherwise authorized by the LWC Project Manager or the KYTC Resident Engineer, the riprap protection shall be placed in conjunction with the construction of the embankment with only sufficient lag in the construction of the riprap protection as may be necessary to allow for proper construction of the portion of the embankment protected and to prevent mixture of embankment and riprap material. Bank run gravel shall be placed and graded to a depth of 6 inches to obtain a continuous uninterrupted bed of the required thickness within the required limits. It shall be compacted by a minimum of one coverage by a crawler-type tractor with a total weight, including blade and equipment, of not less than 30,000 lbs.
- B. Riprap shall be hand-placed on the prepared bed of compacted gravel base. Stones shall be laid so that the maximum dimension is perpendicular to the prepared bed. The stones shall be placed so that the weight of the stone is carried by the underlying material and not by the adjacent stones. Large stones shall be placed at the bottom of the slope. Spaces between stones shall be filled with spalls of suitable size to construct a solid, stable slope, free from large voids and defects which might not protect the earth slopes against erosion.

3.13 GRADING AND SEEDING

- A. Grading in preparation for placing loam and seeding shall be done at all excavations and in all areas disturbed by operations. Surfaces shall be restored to their original grade and condition. The subgrade shall be maintained in a condition that will be well drained.
- B. The subgrade shall be raked and all rubbish, sticks, roots and stones larger than $\frac{3}{4}$ inch shall be removed. Loam or topsoil salvaged from the excavation shall be spread to a depth sufficiently higher than required so that after natural settlement and light rolling the finish grade will match the surrounding area. Loam depth shall be 6 inches minimum in its settled and rolled state.
- C. Grass seed shall be a commercial blend approved by the LWC Project Manager and the KYTC Resident Engineer and lightly raked into the surface in accordance with package directions. All seeded areas shall be protected and shall be watered as required until a firm dense growth has been established.

END OF SECTION

SECTION 02221

TRENCHING, BACKFILLING AND COMPACTION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform all trenching for pipelines and appurtenances, including drainage, filling, backfilling, disposal of surplus material and restoration of trench surfaces and easements.
- B. Excavation shall extend to the width and depth shown on the Drawings or as specified herein and shall provide suitable room for installing pipe, structures and appurtenances.
- C. Furnish and place all sheeting, bracing and supports and shall remove from the excavation all materials which the LWC Project Manager or the KYTC Resident Engineer may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry and in all respects, acceptable. If conditions warrant, deposit gravel for pipe bedding, or gravel refill for excavation below grade, directly on the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatever. The length of open trench shall be related closely to the rate of pipe laying but in no case shall exceed 50 feet. All excavation shall be made in open trenches.
- D. All excavation, trenching and related sheeting, bracing, etc, shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- E. Wherever the requirement for 95% compaction is referred to herein it shall mean "at least 95% of maximum density as determined by ASTM D1557, Method D".
- F. Prior to the start of work, submit the proposed method of backfilling and compaction to the LWC Project Manager and the KYTC Resident Engineer for review.

1.02 RELATED WORK

- A. Granular fill materials are included in Section 02200

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 TRENCH EXCAVATION

- A. Trench excavation shall include material of every description and of whatever substance encountered. Pavement shall be cut with a saw, wheel or pneumatic chisel along straight lines before excavating.
- B. Strip and stockpile topsoil from grassed areas crossed by trenches. At the Contractor's option, topsoil may be otherwise disposed of and replaced, when required, with approved topsoil of equal quality.

- C. While excavating and backfilling is in progress, traffic shall be maintained, and all utilities and other property protected as provided in the General Conditions and General Requirements.
- D. Trenches shall be excavated to the depth indicated on the Drawings or in critical areas as recommended by the Geotechnical Engineer, whichever is deeper and in widths sufficient for laying the pipe, bracing and for pumping and drainage facilities. The bottom of the excavations shall be firm and dry and in all respects acceptable to the LWC Project Manager and the KYTC Resident Engineer. Trench width shall be practical minimum.
- E. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. The trench may be excavated by machinery to, or just below the designated subgrade, provided that material remaining in the bottom of the trench is no more than slightly disturbed. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by screened gravel fill as required by the LWC Project Manager and the KYTC Resident Engineer at the Contractor's expense.
- F. Clay and silt soils are particularly susceptible to disturbance due to construction operations. When excavation is to end in such soils, use a smooth-edge bucket to excavate the last 1 foot of depth.
- G. Where pipe is to be laid in screened gravel bedding, the trench may be excavated by machinery to the normal depth of the pipe provided that the material remaining in the bottom of the trench is no more than slightly disturbed.
- H. Where pipe is to be laid directly on the trench bottom, final excavation at the bottom of the trench shall be performed manually, providing a flat-bottom true to grade upon undisturbed material. Bell holes shall be made as required.

3.02 DISPOSAL OF MATERIALS

- A. Excavated material shall be stacked without excessive surcharge on the trench bank or adjacent slopes or obstructing free access to hydrants and gate valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.
- B. It is expressly understood that no excavated material shall be removed from the site of the work or disposed of, except as directed by the LWC Project Manager or the KYTC Resident Engineer. When removal of surplus materials has been approved by the LWC Project Manager or the KYTC Resident Engineer, dispose of such surplus material in approved designated areas.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench or on hillside slopes, the material shall be hauled and stored at a location provided. When required, it shall be re-handled and used in backfilling the trench.

3.03 SHEETING AND BRACING

- A. Furnish, put in place and maintain sheeting and bracing required by Federal, State or local safety requirements to support the sides of the excavation and prevent loss of ground which could endanger personnel, damage or delay the work or endanger adjacent structures. If the LWC Project Manager or the KYTC Resident Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he/she may order additional supports placed at the

expense of the Contractor. Compliance with such order shall not relieve the Contractor from his/her responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

- B. Where sheeting and bracing is required to support the sides of trenches, engage a professional engineer, registered in the Commonwealth of Kentucky, to design the sheeting and bracing. Submit design calculations and drawings of the shoring, bracing, or retention system for review. The sheeting and bracing installed shall be in conformity with the design and certification of this shall be provided by the professional engineer. Submit P.E. Certification Form contained in Section 01300 to show compliance with this requirement.
- C. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the screened gravel backfill.
 - 1. When installing ductile iron, or pre-stressed concrete cylinder pipe, any portion of the box extending below mid diameter shall be raised above this point prior to moving the box ahead to install the next pipe. This is to prevent the separation of installed pipe joints due to movement of the box.
 - 2. When installing flexible pipe (PVC, etc), trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below mid-diameter of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, screened gravel shall be placed to fill any voids created and the screened gravel and backfill shall be recompact to provide uniform side support for the pipe.
- D. Permission will be given to use steel sheeting in lieu of wood sheeting for the entire job wherever the use of sheeting is necessary. The cost for use of sheeting will be included in the bid items for pipe and shall include full compensation for driving, bracing and later removal of sheeting.
- E. All sheeting and bracing shall be carefully removed in such manner as not to endanger the construction of other structures, utilities, or property, whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, by watering or otherwise as directed.
- F. No payment will be given for sheeting, bracing, etc, during the progress of the work. No payment will be given for sheeting which has actually been left in the trench for the convenience of the Contractor.
- G. Sheeting driven below mid-diameter of any pipe shall remain in place from the driven elevation to at least 1 foot above the top of the pipe.

3.04 TEST PITS

- A. Excavation of test pits may be required for the purpose of locating underground utilities or structures as an aid in establishing the precise location of new work.
- B. Test pits shall be backfilled in accordance with the requirements for trench backfill as soon as the desired information has been obtained. The backfilled surface shall be maintained in a satisfactory condition for travel until resurfaced as specified.

3.05 EXCAVATION BELOW GRADE AND REFILL

- A. Whatever the nature of unstable material encountered or the groundwater conditions, trench drainage shall be complete and effective.
- B. If the Contractor excavates below grade through error or for the Contractor's own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, he may be directed by the LWC Project Manager or the KYTC Resident Engineer to excavate below grade as set forth in the following paragraph, in which case the work of excavating below grade and furnishing and placing the refill shall be performed at his own expense.
- C. If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into the screened gravel notwithstanding effective drainage, the subgrade material shall be removed to the extent directed and the excavation refilled with a 6 inch layer of coarse sand, or a mixture graded from coarse sand to the fine peastone, as approved by the LWC Project Manager and the KYTC Resident Engineer, to form a filter layer preserving the voids in the gravel bed of the pipe. The composition and gradation of gravel shall be approved by the LWC Project Manager and the KYTC Resident Engineer prior to placement. Screened gravel shall then be placed in 6 inch layers thoroughly compacted up to the normal grade of the pipe. If directed by the LWC Project Manager or the KYTC Resident Engineer, compacted structural fill shall be used for refill of excavation below grade.
- D. Geotextile filter fabric may be substituted for filter layer if approved by the LWC Project Manager and the KYTC Resident Engineer. Filter fabric shall be Mirafi 140N; Supac equivalent, or equal.

3.06 BACKFILLING

- A. As soon as practicable after the pipe has been laid and jointed, backfilling shall begin and thereafter be prosecuted expeditiously. Bedding gravel, as specified for the type of pipe installed, shall be placed up to 1 foot over the pipe.
- B. If water restrictions are in force, obtain water elsewhere, or compact the backfill by other approved methods at no additional cost to this Contract.
- C. Where other methods are not practicable, compaction shall be by use of hand or pneumatic ramming with tools weighing at least 20 lbs. The material being spread and compacted in layers not over 6 inches thick for structural fill, crushed stone and screened gravel for structural fill, and not over 4 inches thick for common fill and select common fill. If necessary, sprinkling shall be employed in conjunction with rolling or ramming to achieve the necessary moisture content for compaction.
- D. Backfill around structures shall be selected common fill material, may be compacted by puddling where approved by the LWC Project Manager and the KYTC Resident Engineer. All backfill shall be compacted, especially under and over pipes connected to the structures.
- E. Bituminous paving shall not be placed in backfilling unless specifically permitted, in which case it shall be broken up as directed. Frozen material shall not be used under any circumstances.
- F. All road surfaces shall be broomed and hose-cleaned immediately after backfilling. Dust control measures shall be employed at all times.

3.07 RESTORING TRENCH SURFACE

- A. Where the trench occurs adjacent to paved streets, in shoulders, sidewalks, or in cross-country areas, thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, immediately deposit additional fill to restore the level of the ground.
- B. In and adjacent to streets, the top 12 inch layer of trench backfill shall consist of low strength mortar backfill where required or compacted structural fill or crushed stone. Should the Contractor wish to use material excavated from the trench as gravel subbase for pavement replacement, the Contractor, at his/her own expense, have samples of the material tested by an independent testing laboratory at intervals not to exceed 500 feet, in order to establish its compliance with the specifications. Only material which has been tested and approved by the LWC Project Manager and the KYTC Resident Engineer shall be allowed to be incorporated into the work.
- C. The surface of any driveway or any other area which is disturbed by the trench excavation and which is not a part of the paved road shall be restored to a condition at least equal to that existing before work began.
- D. In sections where the pipeline passes through grassed areas, and at the Contractor's own expense, remove and replace the sod, or loam and seed the surface to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer.
- E. Where excavations are made into existing slopes and embankments, the slopes and embankments shall be reconstructed to original grades in accordance with Specification Section 02200, paragraph 3.08.A-1, Earth Embankments, Common Fill.

END OF SECTION

SECTION 02605

PRECAST CONCRETE STRUCTURES

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment required and install precast concrete structures, access hatches, and appurtenances as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Earthwork is included in Section 02200.
- B. Cast-in-place concrete is included in Section 03300.

1.03 SUBMITTALS

- A. Submit, in accordance with Section 01300, shop drawings, product data, materials of construction, and details of installation. Submittals shall include the following:
 - 1. Structure openings.
 - 2. Access frame and cover with notarized certificate indicating compliance with ASTM A48, Class 30.
 - 3. Method of repair for minor damage to precast concrete sections.
- B. Samples
- C. Design Data
 - 1. Precast concrete structures:
 - a. Sectional plan(s) and elevations showing dimensions and reinforcing steel placement.
 - b. Structural calculations including assumptions.
 - c. Concrete design mix.
- D. Test Reports
 - 1. Precast concrete structures:
 - a. Concrete test cylinder reports from an approved testing laboratory certifying conformance with this Section.
- E. Certificates as required

F. Manufacturers Installation

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM A48 - Standard Specification for Gray Iron Castings.
2. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
3. ASTM C33 - Standard Specification for Concrete Aggregates.
4. ASTM C150 - Standard Specification for Portland Cement.
5. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.

B. American Concrete Institute (ACI)

1. ACI 318 - Building Code Requirements for Structural Concrete
2. ACI 350R - Environmental Engineering Concrete Structures

C. American Association of State Highway and Transportation Officials (AASHTO)

1. Standard Specifications for Highway Bridges

D. Occupational Safety and Health Administration (OSHA)

E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. All material shall be new and unused.

B. Materials' quality, manufacturing process and finished sections are subject to inspection and approval by LWC Project Manager or the KYTC Resident Engineer. Inspection may be made at place of manufacture, at work site following delivery, or both.

C. Materials will be examined for compliance with ASTM standards, this Section and approved manufacturer's drawings. Additional inspection criteria shall include: appearance, dimensions(s), blisters, cracks and soundness.

D. Materials shall be rejected for failure to meet any requirements specified herein. Rejection may occur at place of manufacture, at work site, or following installation. Mark for identification rejected materials and remove from work site immediately. Rejected materials shall be replaced at no additional cost to Owner.

- E. Repair minor damage to precast concrete sections by approved method, if repair is authorized by LWC Project Manager or the KYTC Resident Engineer.

PART 2: PRODUCTS

2.01 GENERAL

- A. Reference to a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- B. Like items of materials/equipment shall be the end products of one manufacturer in order to provide standardization for appearance, operation, maintenance, spare parts and manufacturer's service.
- C. Provide lifting lugs or holes in each precast section for proper handling.

2.02 PRECAST CONCRETE STRUCTURES

- A. Precast reinforced concrete structures shall be manufactured by Thorn-Orwick, Inc. or equal. Refer to Drawings for inside dimensions, headroom requirements and other installation requirements.
- B. Manufacturer shall notify LWC Project Manager and the KYTC Resident Engineer at least 5 working days prior to placing concrete during manufacturing process. LWC Project Manager or the KYTC Resident Engineer may inspect reinforcing steel placement prior to placing concrete.
- C. Structural design calculations and Drawings shall be prepared and stamped by a Professional Engineer registered in Kentucky and submitted with the Shop Drawings.
- D. Design Criteria
 - 1. Precast concrete
 - a. Minimum compressive strength shall be 4,500 psi at 28 days.
 - b. Maximum water-to-cement ratio shall be 0.40 by weight.
 - c. Minimum cement content shall be 600 lbs of cement per cubic yard of concrete.
 - 2. Manufactured products
 - a. Conform to ACI 318 and ACI 350R.
 - b. Analyze walls and slabs using accepted engineering principals.
 - c. When "fy" exceeds 40,000 psi, "z" (ACI 318) shall not exceed 95 kips/in, "fs" shall be completed and shall not exceed 50 percent of "fy".

- d. Design products to support their own weight, weight of soil at 130 pcf, and a live load equal to AASHTO HS-20 applied to top slab.
- e. Cast base slab and walls together to form a monolithic base section.
- f. Design structure walls for a lateral pressure based on an equivalent fluid unit weight of 90 pounds per cubic foot (pcf). Originate pressure diagram at finished ground surface. Include lateral pressure from vehicles in accordance with AASHTO.
- g. Consider discontinuities in structure produced by openings and joints. Provide additional reinforcing around openings. Frame openings to carry full design loads to support walls.
- h. Prevent flotation, with ground water level at finished ground surface, by dead weight of structure and soil load above structure. Do not consider skin friction, soil friction, or weight of equipment in structure.
- i. Locate horizontal wall joints 18-in minimum from horizontal centerline of wall openings.
- j. Design structure with a minimum number of joints. Maximum number of structure sections, including top slab, shall be four.
- k. Provide lifting hooks for top slab.
- l. Locate access openings, wall sleeves and pipe penetrations as shown on Drawings.
- m. Wall sleeves for pipes shall be provided by the precast concrete manufacturer.

2.03 PIPE CONNECTIONS

- A. Wall Sleeves (pass through pipe vaults) – Provide steel or ductile iron pipe sleeve cast into wall. Annular space between pipe and sleeve to be sealed with mechanical seal, Linkseal or equal.

2.04 DAMPPROOFING

- A. Dampproofing shall be Hydrocide 648 by Sonneborn Building Products; Dehydratine 4 by A.C. Horn Inc; Meadows Trowel Mastic (Type 3) or equal.

2.05 ACCESS FRAME AND COVER

- A. Manhole frames and covers shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind which render them unfit for the service for which they are intended. Manhole covers and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30.

- B. Manhole covers shall have a diamond pattern and pickholes and covers shall be Neenah Foundry or equal.

PART 3: EXECUTION

3.01 INSTALLATION

A. Structure Installation

- 1. Structures shall be constructed to the dimensions shown on the Drawings and as specified herein. Protect all work against flooding and flotation. Construct cast-in-place bases in accordance with the requirements of Division 3 and the details shown on the Drawings.

B. Dampproofing

- 1. Paint outer surfaces of precast structures with two coats of bituminous dampproofing at the rate of 30 to 60 sq ft per gallon, in accordance with manufacturer's instructions.

- C. The LWC Project Manager and the KYTC Resident Engineer will visually inspect structure(s) for possible leaks before backfilling of structures is allowed. Seal all joints to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer.

- D. Thoroughly clean all new structures of all silt, debris and foreign matter of any kind, prior to final inspections.

END OF SECTION

SECTION 02616

DUCTILE IRON PIPE AND FITTINGS

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required, install, disinfect and test 36-inch ductile iron pipe and fittings as shown on the Drawings and as specified herein as an alternative pipe material.
- B. Piping shall be located as shown on the Drawings. The LWC Project Manager and the KYTC Resident Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference between pipes or other utility lines. Pipe fitting notation is for the Contractor's convenience and does not relieve him/her from installing and jointing different or additional items where required to achieve a complete piping system.
- C. Where the word "pipe" is used it shall refer to pipe, fittings, or appurtenances unless otherwise noted.

1.02 RELATED WORK

- A. Pipe testing and cleaning is included in Section 01445.
- B. Trenching, Backfilling and Compaction is included in Section 02221.
- C. Valves are included in Section 15100.

1.03 SUBMITTALS

- A. Submit shop drawings, product data, piping layouts, design calculations, warranty information, test reports, and manufacturer's literature in accordance with Section 01300 referenced standards.
- B. Submit design calculations for record purposes only in accordance with Paragraph 2.02 below signed by a Professional Engineer licensed in Kentucky, as noted in Section 01300. This includes all load combinations and pipe restraint requirements.
- C. Submit the name of the pipe and fitting suppliers and a list of materials to be furnished.
- D. Prior to shipment of pipe, certified copies of mill tests confirming the type of materials used in the pipe, and shop testing of pipe to show compliance with the requirements of the applicable standards, along with a sworn affidavit of compliance that the pipe complies with the referenced standards, shall be submitted.
- E. Submit copies of all shop tests, including hydrostatic tests.
- F. Submit information on all warranties per Section 01740.
- G. Submit shop drawings with a tabulated laying schedule which references stations and invert elevations as shown on the Drawings as well as all fittings, bends, outlets, restrained joints, tees, special deflection bells, adapters, solid sleeves and specials, along with the manufacturer's

drawings and specifications providing complete details of all items. The laying schedule shall show pipe class and class coding. The above shall be submitted to the LWC Project Manager via the KYTC Resident Engineer for approval before manufacture and shipment. Full length pipe may be supplied from inventory provided that all specification requirements are met. Shop drawings shall include but not be limited to:

1. Complete and dimensional working drawings of all pipe layouts, including pipe stationing, invert elevation at changes in grade or horizontal alignment, all elements of curves and bends both in horizontal alignment and vertical position.
 2. The grade of material; size, wall thickness, of the pipe and fittings and appurtenances, type and location of fittings, specials, and valves; and the type and limits of the lining, lining reinforcing and coating systems of the pipe and fittings. Methods and procedures recommended by the coating manufacturer will be documented.
 3. Joint details; methods and locations of supports, and complete information concerning type, size and location of all welds. Shop welds (no field welding will be allowed) will be clearly differentiated and welds will be clearly detailed with preparation procedures for all pipe and parent material comprising each weld. Critical welding procedures will be identified along with methods for controlling welding stresses and distortions. Locations and proposed joint details will also be clearly identified.
 4. Method of manufacture of pipe; joint details; fittings; and any specials.
 5. All other pertinent information for all items to be furnished; product data to show compliance of all couplings, supports, fittings, coatings and related items.
- H. Submit anticipated production and delivery schedule.
- I. Prior to shipment of pipe, submit a certified affidavit of compliance from the manufacturer stating that the pipe, fittings, gaskets, linings and exterior coatings for this project have been manufactured and tested in accordance with AWWA and ASTM standards and requirements specified herein.
- J. Submit handling procedures for all phases from finished fabrication through delivery including storage, transportation, loading, and unloading. Submit Catalog cuts and installation instructions for boltless restrained joint pipe and mechanically restrained connections to valves. Contract shall also submit Certification that all bolts to be furnished conform to referenced standards.
- K. This will include storage at the project site and required protection following installation prior to startup.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
1. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 2. ASTM A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
 3. ASTM A242 – Standard Specification for High-Strength Low-Allow Structural Steel

4. ASTM A307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
5. ASTM A674 – Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids.
6. ASTM C150 - Standard Specification for Portland Cement.

B. American Water Works Association (AWWA)

1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-in through 48-in (75mm through 1219mm) for Water.
4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
6. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water.
7. AWWA C115 – Flanged Ductile Iron Pipe with Ductile Iron or Grey Iron Threaded Flanges.
8. AWWA C116 – Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior surfaces of Ductile Iron and Grey Iron Fittings for Water Supply Service.
9. AWWA C153 - Ductile- Iron Compact Fittings, 3-in through 24-in and 54-in through 64-in, for Water.
10. AWWA C550 – Protective Interior Coatings for Valves and Hydrants
11. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
12. AWWA C606 - Grooved and Shouldered Joints.
13. AWWA C651 - Disinfecting Water Mains.
14. AWWA M41 – Ductile Iron Pipe and Fittings Manual of Water Supply Practices

C. National Sanitation Foundation (NSF)

1. NSF 61 – Drinking Water System Components Health Effects.

D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. It is a requirement of these Contract Documents to have the entire ductile iron pipe under this section designed and supplied by a single manufacturer rather than have selection and supply of these items by a number of different manufacturers. Similarly. It is a requirement of these Contract Documents to have all of the ductile iron fittings under this section designed and supplied by a single manufacturer rather than have selection and supply of these items by a number of different manufacturers. All connections between the pipe and fittings shall be compatible, as detailed in Section 1.06.
- B. Each length of ductile iron pipe supplied for the project shall be hydrostatically tested at the point of manufacture to 500 psi for a duration of 10 seconds per AWWA C151. Testing may be performed prior to machining bell and spigot. Failure of ductile iron pipe shall be defined as any leak or rupture of the pipe wall. Certified test results shall be furnished in duplicate to the LWC Project Manager prior to time of shipment.
- C. All ductile-iron pipe and fittings to be installed under this project shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. Furnish in duplicate to the LWC Project Manager via the KYTC Resident Engineer sworn certificates of such tests and their results at least 5 days prior to the shipment of the goods. The cost of foundry inspection of all pipe approved for this contract, plus the cost of inspection of a reasonable amount of disapproved pipe will be borne by the Louisville Water Company.
- D. Inspection of the pipe and fittings will also be made by the representative of the Louisville Water Company after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements even though pipe may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery (including defects from manufacturing or delivery/transport) shall be marked for identification and shall immediately be removed from the job at the Contractors expense.
- E. All pipe and fittings to be installed under this Contract may be inspected at the plant for compliance with this Section by an independent testing laboratory selected by the Louisville Water Company at the Louisville Water Company's expense.
- F. A manufacturer's representative shall be made available to the Louisville Water Company's representative during the manufacturing, furnishing, transporting, and unloading of the pipe; during installation and testing of the pipe to assist in insuring that the pipe is properly fabricated, transported, unloaded, stored in the field, joined and tested. Manufacturer's responsibilities relate only to the proper care and treatment of the pipe during these procedures and not the techniques or procedures used during installation and testing.
1. The designated factory representative shall be made available at any time the Louisville Water Company may request. The field or site representative shall be made available a minimum of 10 working days (time on site) during the project when requested by the Louisville Water Company.
 2. The cost for the services of the factory representative, including expenses, shall be considered incidental to the project and will not be paid separately.
- G. The manufacturer shall meet the following criteria and furnish the necessary project information, which demonstrates the required experience:
1. Ductile iron pipe and fittings shall be manufactured by an LWC pre-qualified vendor. Prequalified LWC DIP vendors include Mueller Pipe, American Cast Iron Pipe Company, Griffin Pipe Co., and the McWane Company or approved equal.

2. Experience that includes successful fabrication (followed by installation, acceptance and service) to AWWA C151 standards of at least 50,000 lineal feet of the largest specified diameter or larger ductile iron pipe with similar linings/coatings within the past 5 years.
 3. Experience shall include the successful fabrication of at least 50- fittings in compliance with AWWA C110 or C153 of the largest specified diameter or larger with similar lining/coatings within the past 5 years.
 4. Experience that includes the successful fabrication (followed by installation, acceptance and service) of at least 10,000 lineal feet of the largest specified diameter or larger push-on style, boltless restrained joint for ductile iron pipe within the last 5 years.
- H. All pipe and fittings shall be marked in accordance with all applicable AWWA standards. Legibly and permanently mark all pipe, fittings, specials and appurtenances to be consistent with the laying schedule and marking drawings with the following information:
1. Manufacturer' name, trademark or identification number.
 2. Date of manufacture.
 3. Size, type, class, and wall thickness.
 4. AWWA Standard(s) produced to.
 5. Each pipe shall be identified with sequential numbering consistent with the laying schedule and marking drawings and each marked pipe will appear on the marking drawings in the identified location for installation.
 6. Special fittings, bends, and appurtenances requiring specific orientation will be appropriately marked with the words "TOP" in the correct position and in a consistent location.
- I. Within 10 days after bid opening, the manufacturer proposed for supplying the ductile iron pipe to the apparent low bidder shall submit to the LWC Project Manager via the KYTC Resident Engineer through the bidder a list of five similar projects successfully manufactured at the proposed plant, installed and in operation, including for each – pipe diameters and lengths; project name and location; consulting engineer's name, address, phone number, and reference contact; installation contractor's name, address, phone number, and reference contact; owner's name, address, phone number, and reference contact.

1.06 DESCRIPTION OF SYSTEMS

- A. Pipe and fittings shall be as supplied by the American Cast Iron Pipe Co., U.S. Pipe and Foundry, Griffin Pipe Products, the McWane Company or an equal who is a member of the Ductile Iron Pipe Research Association (DIPRA). All ductile iron pipes shall be supplied by a single manufacturer and all ductile iron fittings shall be supplied by the pipe manufacturer.
- B. Pipe is to be installed in those locations shown on the Drawings, and only where specifically indicated.
- C. Contractor is responsible for compatibility between joints of all items they supply.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe, pipe linings and pipe coatings. See AWWA C600 and the referenced AWWA Standards for Shipping, handling and storage procedures. All pipe and fittings shall be examined as noted in Division 1. Any damage to linings or coatings discovered during the examination shall be repaired to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer at the cost of the Contractor, before proceeding with the work.
- B. Pipe shall be transported to the job site on padded bunks or oak timbers and secured with steel banding or nylon tie down straps to adequately protect the pipe and coating. Slings, acceptable to the LWC Project Manager shall be used in pipe handling. No uncushioned ropes, chairs, wedges, cables, forks, or levers shall be used in handling finished pipe, fittings or couplings. Under no circumstances shall forks or other construction equipment be inserted into the pipe for movement. Under no circumstances shall the pipe or fittings be dropped or skidded against each other. Care shall be taken to preventing marring the pipe coating. Padded wooden pipe cradles, or chocks suitable for the protection of coatings shall be used between finished pipes and beneath them when pipes are placed upon rough surfaces. Pipe shall not be stored on bare ground unless soft sand berms are used to support the pipe and is approved by the LWC Project Manager.
- C. Materials, if stored, shall be kept safe from damage. The interior of all pipes, fittings and other appurtenances shall be kept free from dirt, excessive corrosion or foreign matter at all times.
- D. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall conform to manufacturer's recommendations and/or AWWA C600.
- E. Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.
- F. Lined and/or coated pipe shall be suitably protected from exposure and heating of the sun at all times following procedures recommended by the coating/lining system manufacturer. Exposure will not be allowed (except for short periods such as installation, assembly and repairs).
- G. No metal tools or heavy objects shall be permitted to come in contact unnecessarily with the finished coating. Workers will be permitted to walk upon the coated pipe only when necessary, in which case they shall wear footwear with rubber or composition soles and heels that are sufficiently free of dirt and mud that coating remains undamaged.
- H. It shall be the responsibility of the Contractor to prevent damage to the linings and coatings that might be caused by handling and/or onsite storage of the finished pipe at low temperatures (due to embrittlement), high temperatures or direct sunlight.

1.08 WARRANTIES

- A. Provide warranties as required in Section 01740.

PART 2: PRODUCTS

2.01 MATERIALS

- A. Ductile iron pipe shall conform to AWWA C151. Pipe shall be supplied in standard lengths.
- B. Thickness design shall be per AWWA C150 and provide minimum Class 250 for 24-inch transmission main and Class 350 for 4-20 inch distribution main. The pipe supplier shall perform thickness analysis as referenced in Paragraph 2.02. All ductile iron pipe supplied shall meet the minimum wall thickness and pressure class.
- C. Ductile iron pipe shall conform to the latest specifications as adopted by American National Standards Institute, Inc., (ANSI) and American Water Works Association (AWWA). Specifically, ductile iron pipe shall conform to ANSI/AWWA C151/A21.51.
- D. The pipe shall be coated outside with a bituminous coating in accordance with ANSI/AWWA C151/A21.51. The pipe interior shall be lined with cement mortar and seal coated in compliance with the latest revision of ANSI/AWWA C104/A21.4.
- E. The pipe shall be encased in a double layer of polyethylene as shown on the Drawings and specified herein.

2.02 DUCTILE IRON PIPE DESIGN

- A. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with minimum yield strength of 42,000 psi (per AWWA M-41). Design shall be done for external and internal pressures separately using the larger of the two for the net design thickness. Additional allowances shall be made for service allowance and casting tolerance per AWWA C150. The pipe classes determined for various sizes and conditions shall provide the total calculated thickness at a minimum or conform to minimum pipe class.
- B. Design for the net thickness for external loading shall be taken as the greater of the following conditions:
 - 1. 2-1/2-ft of cover with AASHTO H-20 wheel loads, with an impact factor of 1.5.
 - 2. Depth from existing ground level of future proposed grade (whichever is greater) to top of pipe as shown on the Drawings, with truck load.
 - 3. Soil Density: 110 lbs. per cu ft.
 - 4. Laying Conditions; AWWA C150, Type 5.
- C. Design for the net thickness shall be based upon the following internal pressure conditions:
 - 1. Design pressure: 175 PSIG
 - 2. Surge allowance: 100 PSIG
 - 3. Safety factor: 2

4. Total internal pressure design: $2 ([175] + [100]) = [550]$ PSIG
 5. E' : [700] psi
- D. Copies of design calculations showing that the pipe meets all of the requirements specified herein shall be furnished to the LWC Project Manager via the KYTC Resident Engineer for approval during shop drawing review in accordance with Section 01300. A yield strength of 42,000 psi shall be used during design calculations.
- E. Restrained Joints:
1. The entire 24-inch replacement shall include restrained joints at each joint. In addition, thrust blocks are required at every bend and tee and at each tie-in point. 4-20-inch main do not require restrained joints but shall include thrust blocks per LWC standard specifications.
 2. Pipe joints for the 24-inch pipe shall be proprietary designs using a factory welded retainer ring on the spigot. The following manufacturers' products are approved: American Lok Ring, American Flex Ring (for pipe diameter 48-inch and less), Griffin Snap Lok, Griffin Bolt Lok, and U.S. Pipe TR Flex.
 3. The restrained joint system shall meet or exceed the test pressures outlined in Specification Section 01445.
 4. When restrained joints are required, they shall be boltless push-on type. Boltless restrained joints shall be either U.S. Pipe & Foundry "TR Flex", American Ductile Iron Pipe "Flex-Ring", or equal. Restrained joint pipe shall be furnished with a factory welded retaining ring. Utilize a positive mechanical restraint such as American's Coupling Gland Ends, or equal. The use of friction type restrained joints such as Megalugs shall not be allowed.
- F. The 24-inch pipe system shall be limited to one pipe thickness and shall be clearly marked on the pipe and shall be minimum pressure class 250 suitable for a minimum depth of covers of 15 feet.

2.03 END TREATMENTS/JOINTS

- A. All ductile iron pipe/fitting joints shall be push-on rubber gasket type restrained, except where flanged joints are required as shown on the drawings. Restrained joints shall be push on rubber gasket, locking ring type restrained joints per the manufacturer' standard described in Paragraph B, except where flange joints are shown on the Drawings. All gasket materials shall comply with Table 5-1 of AWWA M-41. Rubber-gasket joints shall conform to AWWA C111 and suitable for chlorinated and chloraminated water. Gasket shall be of styrene butadiene rubber (SBR).
- B. Restraint for push on joint pipe shall be positive locking "Locked-type" joints manufactured by the pipe and fitting manufacturer that utilize restraint independent of the joint gasket. All restrained joints shall be suitable for the specified 300 PSIG test pressure. Joints shall be fabricated of heavy section ductile iron casting. Restrained push on joints shall be by one of the following or an approved equal:
- "TR Flex" by Mueller

- "Lok-Ring", "Flex Ring" (positive locking style)" by the American Cast Iron Pipe Company
 - "Snap Lok" by Griffin Pipe Products Company.
 - "Superlok" by Clow Water Systems Company
1. The minimum number of restrained joints required for resisting forces at fittings and changes in direction of the pipe shall be determined from the length of restrained pipe on each side of the fittings and changes in direction necessary to develop adequate resisting friction with the soil, The required lengths of restrained joints shall be as shown on the Drawings.
 2. Restrained pipe joints that achieve restraint by incorporating cut out sections in the wall of the pipe shall have a minimum wall thickness at the point of the cut out that corresponds with the minimum specified wall thickness for the rest of the pipe.
- C. Threaded ductile iron flanges for ductile iron pipe shall be fabricated per AWWA C115 and sealed during installation with a special high pressure, full face gasket per AWWA C111. At the pipe manufacturer's option, the use of 250 lb pattern flanges, which are faced and drilled in accordance with ANSI B16.1 may be substituted in order to match valves or other equipment and/or to meet the required working pressure requirements. All flanges shall be rated for the same pressure as the adjacent pipe in all cases. Compatibility of the flanges with the 250 lb class and higher special class AWWA valves will be the responsibility of the Contractor.
1. Flanges shall be pre drilled and then faced after being screwed onto the pipe, with flanges true to 90 degrees of the pipe axis and shall be flush with the end of the pipe.
 2. Gaskets shall be full face rubber, 1/8" thick SBR material. Such as American Torseal Gasket, or approved equal.
 3. Flanged joints shall be supplied with bolts and nuts on one end, bolt studs with a nut at each end, or studs with nuts on one end where the flange is tapped. The number and size of bolts shall comply with the same standard as the flange. Bolts and nuts shall, except as otherwise specified or noted in the Specifications or on the Drawings, comply with ASTM A193, grade B7.
 4. Blind flanges shall mate with regular flanges.
 5. Filler flanges and beveled flange fillers shall be furnished faced and drilled complete with extra length bolts.
- D. Couplings and Adapters
1. Sleeve type couplings shall be Dresser Style 38, 138 or equal.
 - a. Buried sleeve-type couplings shall have a protective wrapping of "Denso" material by DENSO Inc. of Texas or equal. Where "Denso" material is used, the joint shall be packed up with "Densyl mastic" to give an even contour for wrapping with "Densopol" tape. A 1.5 mm thick coating of "Denso" paste shall be applied following by 100 mm or more wide "Densopol" tape wound spirally round the joint with at least 50 percent overlap.
 2. Split Sleeve type flexible couplings shall be Victaulic Depend-O-Lok Style or F x F (self-restrained) or equal.

3. Grooved flexible joints for ductile iron pipe sizes 24-in and smaller must be in accordance with AWWA C606 and shall be Victaulic Style 31 or equal.
4. Shouldered flexible joints for ductile iron pipe larger than 24-in shall be Victaulic Style 44 or equal.

2.04 FITTINGS

- A. Pipe fittings shall be ductile iron with pressure rating of 250 psi for the 36-inch pipe. Fittings shall meet the requirements of ANSI/AWWA C110/A21.0 or AWWA C153 as applicable. Fittings shall have the same pressure rating, as a minimum, of the connecting pipe.
- B. Closures shall be made with mechanical joint ductile iron solid sleeves unless alternate approved coupling systems are used and shall be located in straight runs of pipe at minimum cover outside the limits of restrained joint sections. Location of closures shall be subject to approval of the LWC Project Manager.

2.05 INTERIOR LINING

- A. Ductile iron pipe and fittings shall have the same type of lining as specified herein.
- B. Ductile iron pipe and fittings shall have a cement mortar lining in accordance with AWWA C104 double thickness. The cement shall be Type I or II per ASTM C150.
- C. At the option of the supplier, fittings may be lined in accordance with AWWA C550. Lining shall be NSF 61 certified.

2.06 EXTERIOR COATING

- A. Buried pipe shall be installed with a bituminous coating in accordance with AWWA C151 and C110 respectively.
- B. Buried pipe shall be installed with double polyethylene encasement. Polyethylene encasement shall have a minimum thickness of 8 mils and meet or exceed the minimum standards established by AWWA C105, current edition. Acceptable manufacturers include Fulton or approved equal.
 1. Polyethylene encasement shall meet minimum size requirements per TABLE 3 of section 2.15 of DIPRA's Installation Guide For Ductile Iron Pipe.
 2. Test results from an independent testing agency certifying that the polyethylene encasement meets all criteria established by AWWA C105, current edition, shall be submitted to the LWC Project Manager via the KYTC Resident Engineer prior to approval of the polyethylene encasement for use. In general, samples shall be submitted and include test results in accordance with the AWWA standard associated with tensile strength, elongation, dielectric strength, impact resistance, and propagation tear resistance.
 3. A 2-inch wide plastic adhesive tape, such as Calpico Vinyl, Polyken 900, or approved equal, shall be used for sealing seams, cuts, or tears in polyethylene encasement. Duct tape shall not be allowed.

PART 3: EXECUTION

3.01 GENERAL

- A. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe, lining or coatings. Pipe and fittings shall not be dropped or skidded against each other. Slings, hooks or pipe tongs shall be used for pipe handling. All pipe and fittings shall be examined before laying and no piece shall be installed which is found to be defective. Any damage to the pipe, lining or coatings shall be repaired per manufacturer's recommendations. Handling and laying of pipe and fittings shall be in accordance with manufacturer's instruction and as specified herein.
- B. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work and when installed or laid, shall conform to the lines and grades required.
- C. Materials, if stored, shall be kept safe from damage. The interior of all pipes, fittings and other appurtenances shall be kept free from dirt, excessive corrosion or foreign matter at all times.
- D. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall conform to manufacturer's recommendations and/or AWWA C600.
- E. Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

3.02 INSTALLING DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe and fittings shall be installed in accordance with requirements of the laying schedule AWWA C600, except as otherwise specified herein. A firm, even bearing throughout the length of the pipe shall be provided by digging bell holes at each joint and by tamping backfill materials at the side of the pipe to the springline per details shown on the Drawings. Blocking will not be permitted. If any defective pipe or fitting is discovered after it has been laid, it shall be removed and replaced with a sound pipe or fitting in a satisfactory manner by the Contractor, at his/her own expense.
- B. All pipe and fittings shall be kept clean until they are used in the work and shall be sound and thoroughly cleaned before laying. When laid, the pipe and fittings shall perform to the lines and grades required. When laying is not in progress, including lunch breaks, open ends of the pipe shall be closed by a watertight plug or other approved means. Sufficient backfill shall be placed to prevent flotation. The deflection at joints shall not exceed that recommended by the manufacturer or 3 degrees whichever is less.
- C. All ductile iron pipe laid underground shall have a minimum of 4 feet of cover unless otherwise shown on the Drawings or as specified herein. Pipe shall be laid such that the invert elevations shown on the Drawings are not exceeded.

- D. Fittings, in addition to those shown on the Drawings shall be provided, where required, in crossing utilities which may be encountered upon opening the trench. Solid sleeve closures shall be installed at locations approved by the LWC Project Manager.
- E. The pipe interior shall be maintained dry and broom clean throughout the construction period.
- F. When field cutting the pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. The end of the cut pipe shall be beveled to conform to the manufacture's recommendations for the spigot end. Any coating removed from the cut end shall be repaired according to manufacturer's recommendation and/or Section 2.06 (whichever method is more stringent in the opinion of the LWC Project Manager). Cement lining shall be undamaged. Cutting of restrained joint pipe will not be allowed, unless approved at specific joints in conjunction with the use of restrainer glands by EBAA Iron or field adaptable restrained joints. Where field cuts are permitted, the pipe to be cut shall be supplied by the factory as "gauged full length". Should full length gauged pipe be unavailable, the pipe to be cut shall be field gauged at the location of the new spigot using a measuring tape, or other means approved by the manufacturer, to verify that the diameter is within the tolerances permitted in Table 1 of AWWA C151.
- G. The deflection of joints shall not exceed 75% of the maximum deflection recommended by the manufacturer.
- H. Jointing Ductile-Iron Pipe
 - 1. Push-on joints shall be made in strict accordance with manufacturer's instructions, AWWA C600 and Appendix B of AWWA C111. If there is conflict, the manufacturer's instructions shall take precedence. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe. The joint surfaces shall be cleaned and lubricated and the plain end of the pipe shall be aligned with the bell of the pipe to which it is to be joined and pushed home. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is properly seated. The surfaces with which the rubber gasket comes in contact shall be thoroughly cleaned just prior to assembly. The gasket shall then be inserted into the groove in the bell. Before starting joint assembly, a liberal coating of special lubricant shall be applied to the gasket and the spigot end. With the spigot end centered in the bell, the spigot end is pushed home.
 - 2. Mechanical joints shall be assembled in strict accordance with the manufacturer's instructions, AWWA C600 and Appendix A of AWWA C111. If there is conflict, the manufacturer's instructions shall take precedence. Pipe shall be laid with bell ends looking ahead. To assemble the joints in the field, thoroughly clean and lubricate the joint surfaces and rubber gasket. Bolts shall be tightened to the specified torques. Under no condition shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage. After installation, apply a bitumastic coating to bolts and nuts and install polyethylene encasement as specified.
 - 3. All components shall be cleaned and lubricated with soapy water prior to assembly. Slip the follower gland and gasket over the pipe plain end making sure the small side of the gasket and lip of the gland face the bell socket. Insert the plain end into socket. Push gasket into position with fingers, gasket should be evenly seated.
Slide gland into position, insert bolts and tighten by hand. Bolts are then tightened alternately (across from one another) to the following normal torques:

<u>Bolt Size</u>	<u>Torque Range (Foot-Pounds)</u>
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0.50"	40 - 60
0.75"	60 - 90
1"	70 - 100
1.25"	90 - 120

4. Bolts in mechanical or restrained joints shall be tightened alternately and evenly. Restraint for mechanical joint pipe shall use retainer glands for restraining joint. All restrained mechanical joints shall be suitable for the specified test pressure.
5. Restrained joints shall be installed according to pipe manufacturer's instructions.
6. Flanged joints shall be assembled in strict accordance with the manufacturer's instructions and Appendix C of AWWA C111. If there is conflict, the manufacturer's instructions shall take precedence. Extreme care shall be taken to ensure that there is no restraint on opposite ends of pipe or fitting, which would prevent uniform gasket compression, cause unnecessary stress, bending or torsional strains, or distortion of flanges or flanged fittings. Adjoining push on joints shall not be assembled until flanged joints have been tightened. Flange bolts shall be tightened uniformly to compress the gasket uniformly and obtain a seal. Flange bolts shall be left with approximately 1/2-inch projection beyond the face of the nut after tightening. After installation apply a bitumastic coating to the bolts and nuts as specified.
7. Sleeve couplings shall only be installed for closure or as shown on the Drawings. Couplings shall not be assembled until adjoining joints have been assembled. After installation. Apply a heavy bitumastic coating to the bolts and nuts and install protective wrap recommended by the manufacturer or as required herein. Care shall be exercised to insure that the insulating properties of insulating and dielectric couplings are maintained.
- I. All blowoffs, outlets, valves, fittings and other appurtenances required shall be set and jointed as indicated on the Drawings in accordance with manufacturer's instructions.
- J. Install double polyethylene encasement around ductile iron pipe in accordance with pipe manufacturer's recommendations.
 1. Polyethylene encasement shall be installed per ANSI/ AWWA C105/A21.5, Method 'A' in accordance with section 2.15 of DIPRA's Installation Guide For Ductile Iron Pipe.
 2. A fabric type or padded sling shall be used when handling polyethylene encased pipe to prevent damage to the polyethylene encasement.
 3. All seams in the polyethylene encasement shall be sealed completely with approved 2-inch wide plastic adhesive tape.
 4. Extreme care shall be taken to ensure that all rips or tears in the polyethylene encasement are properly repaired with additional tape and film as described in ANSI/AWWA C105/A21.5
 5. Extreme care shall be taken when backfilling to avoid damaging the polyethylene encasement
 6. 8 mil thick (linear low density polyethylene tube type)

7. Marking requirements for polywrap are as outlined in AWWA C105-05. Polywrap without correct markings will be rejected.
8. Polyethylene adhesive tape must be compatible with polyethylene wrap and must be not be less than 5 mil thick.
9. Polyethylene encasement shall be the COLOR BLUE. Other colors will be rejected.
10. Contractor shall provide certificate of compliance for Polywrap.

3.03 FILLING AND TESTING

- A. After installation, the pipe shall be tested for compliance as specified herein. Furnish all necessary equipment and labor for the hydrostatic pressure test on the pipelines.
- B. Submit detailed test procedures and method for LWC Project Manager's review via the KYTC Resident Engineer. In general, testing shall be conducted in accordance with AWWA C600. The method and procedures for performing the hydrostatic pressure test shall be approved by the LWC Project Manager. Submit the plan for testing to the LWC Project Manager via the KYTC Resident Engineer at least 10 days before starting a test. Refer to Section 01445.

3.04 CASING PIPE INSTALLATION

- A. The work to be performed under these specifications shall consist of furnishing and installing all materials and equipment and performing all labor required to install pipelines crossing under existing and proposed highways, railroads, and streets by boring, jacking, and tunneling, as specified herein. All bores will be accomplished by dry mechanical bore unless otherwise approved by the LWC Project Manager and the KYTC Resident Engineer. All carrier pipes within the encasement conduit shall be restrained joint pipe of the type specified on the plans, Louisville Water Company Specifications and/or approved by the LWC Project Manager and the KYTC Resident Engineer. The carrier pipe shall be centered and restrained within the casing pipe.

3.05 SUBMITTALS:

- A. The following items shall be submitted before delivery of casing pipe, spacers and end seals:
 1. Submit manufacturer's "Certificate of Compliance" for casing pipe materials furnished.
 2. Submit manufacturer's "Certificate of Compliance" for casing insulator and casing end seal materials furnished.
 3. Submit welders' American Welders Society Certification.

3.06 CASING PIPE MATERIAL

- A. The material shall conform to the chemical and mechanical requirements of the latest revision of ASTM A139 "Electric-Fusion (ARC) Welded Steel Pipe (NPS 4 and over), unless otherwise stated herein.
- B. The pipe furnished shall be grade B. The steel shall be new and previously unused.
- C. Hydrostatic testing shall not be necessary.
- D. Pipe ends shall be beveled at one end (for field welding of circumferential joints) and shall be plain right angle cut at the other end. All burrs at the end of the pipe shall be removed.

E. The wall thickness at any point shall be within 12.5% of the thickness specified in the following table:

<u>Outside Diameter</u>	<u>Nominal Metal Thickness</u>
42.00"	0.500"
30.00"	0.500"

F. Circumference – The outside circumference of the pipe shall not vary more than + or – 1%, but not exceeding + or – 3/4" from the nominal outside circumference.

G. Ovality (Out-of-Roundness) – The pipe diameter within 4.0 in. of ends, shall not vary more than 1% from the specified diameter.

H. Straightness – The pipe shall be straight to within 1/2 inch per length of pipe.

I. All ID obstructions (bead welds, slags, etc.) shall not extend more than 3/32" from the ID face.

J. Each length of pipe shall be legibly marked, stating: manufacturer, grade, diameter, wall thickness and primer.

K. A protective coating shall be applied to the inside and outside of each length of pipe. Following an SSPC SP-7 "Brush-Off Blast Cleaning" surface preparation, 3.0 dry mils of Tnemac Primar 100-99 (red), or of an approved equal, shall be applied in the manner recommended by the respective paint manufacturer.

3.07 QUALITY ASSURANCE

ALLOWABLE TOLERANCES

A. Where grades or elevations are shown on the plans for the pipeline to be installed by open trench, boring, jacking, and tunneling operations, maximum deviation of plan elevation shall be 0.1 foot. The maximum deviation of alignment over the length of the bore shall be 0.1 foot.

B. The Contractor shall have the line and grade of the casing pipe checked after each length of casing pipe is installed.

C. The LWC Project Manager shall determine the corrective action to be taken for tolerances above those stated in this specification.

3.08 JOINTS

A. Comply with American Welding Society (AWS) Code of Arc and Gas Welding in Building Construction. Fully weld all joints with full penetrating weld, including joints of casing pipes laid in open trench areas.

B. The inside welded joint shall be smooth, non-obstructing, and conform to all specifications as required by AWS. The casing pipe shall be installed without any vertical or horizontal bends.

3.09 CASING INSULATORS & END SEALS

SUBMITTALS

Shop drawings and manufacturer's literature for all CONTRACTOR supplied materials shall be promptly submitted to the LWC Project Manager via the KYTC Resident Engineer for approval.

CASING SPACER SUPPLIER

- A. Casing spacers and end seals shall be manufactured by an LWC Approved vendor
- B. Model CCS casing spacer and Model CCES end seals manufactured by Cascade Waterworks Manufacturing; Model SSI casing spacers and Model AC Pull-on end seals manufactured by Advances Products & Systems, Inc. or an approved may be utilized.
- C. It is the responsibility of the Contractor to ensure that the casing spacers are sized appropriately (by the manufacturer) for the carrier pipe.

3.10 MATERIAL SPECIFICATIONS

A. SHELL

- a. Minimum 14 gauge T 304 stainless steel.
- b. All surfaces are fully chemically passivated.

B. RISERS

Minimum 10 ga. T-304 stainless steel, reinforced 6' and over height.

C. FASTENERS

5/16-18" T 304 stainless steel

D. LINER

PVC .090 thick, 85-90 durometer
ASTM D1706-61T – 80
Max constant operating temperature - 150F (64C)
Electrical properties - (ASTM - D149-61)
1380 V/min.

E. RUNNERS

Ultra high molecular weight polymer
Low coefficient of friction
High resistance to abrasion and sliding wear
Toughness under impact
Low deflection under compression
Dielectric insulation

F. Casing End Seals

- 1. Casing ends are to be closed by installing "casing end seals". Casing end seals are made of a neoprene rubber with stainless steel bands used to secure the casing end seal to the casing pipe and the carrier pipe.

G. INSTALLATION

- 1. Casing spacers shall provide projections around the entire circumference of the carrier pipe.
- 2. The carrier pipe shall be centered and restrained within the casing pipe such that the height of the risers and runners are to center the carrier pipe in the casing pipe with a minimum top clearance of three-fourths inch minimum.
- 3. Casing spacers shall be in segments for field assembly, without the need for special tools.

4. Spacer segments shall be fastened securely around the carrier pipe and shall be secured by means other than adhesives.
5. Pipe shall not rest on bells.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and design, install and remove formwork for cast-in-place concrete as shown on the Drawings and as specified herein.
- B. Secure to forms as required or set for embedment as required, all miscellaneous metal items, sleeves, reglets, anchor bolts, inserts and other items furnished under other Sections and required to be cast into concrete.

1.02 RELATED WORK

- A. Concrete Reinforcement is included in Section 03200.
- B. Cast-in-Place Concrete is included in Section 03300.
- D. Grout is included in Section 03600.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Form release agent
 - 2. Form ties
 - 3. Form liners
 - 4. Location and sequence of the concrete placements. Indicate locations of form joints, panel sizes and patterns. Show location of form ties on architectural surfaces.
 - 5. Review of pour sequence, form system and panel layout shall be for appearance and strength of the completed structure only. Approval by the LWC Project Manager or by the KYTC Resident Engineer of forming plans or procedures shall not relieve the Contractor of responsibility for the strength, safety or correctness of methods used the adequacy of equipment, or from carrying out the work in full compliance with the requirements of the Drawings and as specified herein.
- B. Samples
 - 1. Demonstrate to the LWC Project Manager and the KYTC Resident Engineer on a designated area of the concrete substructure exterior surface that the form release agent will not adversely affect concrete surfaces to be painted, coated or otherwise finished and will not affect the forming materials.
- C. Certificates

1. Certify form release agent is suitable for use in contact with potable water after 30 days (non-toxic and free of taste and odor).
 2. Submit completed P.E. certification form for design of formwork in accordance with Section 01300.
- D. Review shall be for appearance and strength of the completed structure only. Approval by the LWC Project Manager or the KYTC Resident Engineer shall not relieve the Contractor of responsibility for the strength, safety or correctness of methods used the adequacy of equipment, or from carrying out the Work in full compliance with the requirements of the Drawings and Specifications.

1.04 REFERENCE STANDARDS

- A. American Concrete Institute (ACI)
1. ACI 301 - Standard Specification for Structural Concrete
 2. ACI 318 - Building Code Requirements for Reinforced Concrete
 3. ACI 347 - Formwork for Concrete
- B. American Plywood Association (APA)
1. Material grades and designations as specified
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. The form liner manufacturer's representative shall be on-site during the initial installation of the form liner to instruct the Contractor on the proper methods of application and use of the liner. He/She shall be available to answer any questions on the liner that the LWC Project Manager may have.

1.06 SYSTEM DESCRIPTION

- A. General: Architectural Concrete is wall, slab, beam or column concrete which will have surfaces exposed to view in the finished work. It includes similar exposed surfaces in water containment structures from the top of walls to 2-ft below the normal water surface in open tanks and basins.
- B. Structural design responsibility: All forms and shoring shall be designed at the Contractor's expense by a professional engineer registered in the Commonwealth of Kentucky. Formwork shall be designed and erected in accordance with the requirements of ACI 301 and ACI 318 and as recommended in ACI 347 and shall comply with all applicable regulations and codes. The design shall consider any special requirements due to the use of plasticized and/or retarded set concrete.

PART 2 PRODUCTS

2.01 GENERAL

- A. The usage of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configurations desired.

2.02 MATERIALS

- A. Forms for cast-in-place concrete shall be made of wood, metal, or other approved material. Wood forms for the project shall be new and unused. Construct wood forms of sound lumber or plywood of suitable dimensions and free from knotholes and loose knots. Where used for exposed surfaces, dress and match boards. Sand plywood smooth and fit adjacent panels with tight joints. Metal forms may be used when approved by the LWC Project Manager and shall be of an appropriate type for the class of work involved. All forms shall be designed and constructed to provide a flat, uniform concrete surface requiring minimal finishing or repairs.
- B. Wall Forms
 - 1. Forms for all exposed exterior and interior concrete walls shall be new and unused "Plyform" exterior grade plywood panels manufactured in compliance with the APA and bearing the trademark of that group, or equal acceptable to the LWC Project Manager and the KYTC Resident Engineer. Provide B grade or better veneer on all faces to be placed against concrete during forming. The class of material and grades of interior plies shall be of sufficient strength and stiffness to provide a flat, uniform concrete surface requiring minimal finishing and grinding.
 - 2. All joints or gaps in forms shall be taped, gasketed, plugged, and/or caulked with an approved material so that the joint will remain watertight and will withstand placing pressures without bulging outward or creating surface patterns.
 - 3. Forms for circular structures shall conform to the circular shape of the structure. Straight panels may be substituted for circular panels if the straight panels do not exceed 2-ft in width nor deflect more than 3½ degrees per joint, nor conflict with specific notes on the Drawings.
- C. Rustications shall be at the location and shall conform to the details shown on the Drawings. Moldings for chamfers and rustications shall be milled and planed smooth. Rustications and corner strips shall be of a nonabsorbent material, compatible with the form surface and fully sealed on all sides to prohibit the loss of paste or water between the two surfaces.
- D. Form Release Agent
 - 1. Coat all forming surfaces in contact with concrete using an effective, non-staining, non-residual, water based, bond-breaking form coating unless otherwise noted. Form release agents used in potable water containment structures shall be suitable for use in contact with potable water and shall be non-toxic and free of taste or odor.
- E. Concrete surfaces which are to be painted shall be formed with hard plastic finished plywood or a similar material which does not require a form release agent unless the Contractor can substantiate to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer that the form release agent will not remain on the formed surface after it is stripped.
- F. Form Ties

1. Form ties encased in concrete other than those specified in the following paragraphs shall be designed so that, after removal of the projecting part, no metal shall remain within 1½-in of the face of the concrete. The part of the tie to be removed shall be at least ½-in diameter or be provided with a wood or metal cone at least ½-in diameter and 1½-in long. Form ties in concrete exposed to view shall be the cone-washer type.
2. Form ties for exposed exterior and interior walls shall be as specified in the preceding paragraph except that the cones shall be of approved wood or plastic.
3. Flat bar ties for panel forms shall have plastic or rubber inserts having a minimum depth of 1½-in and sufficient dimensions to permit proper patching of the tie hole.
4. Ties for liquid containment structures shall have an integral waterstop that is tightly welded to the tie.
5. Common wire shall not be used for form ties.
6. Alternate form ties consisting of tapered through-bolts at least 1-in in diameter at smallest end or through-bolts that utilize a removable tapered sleeve of the same minimum size may be used at the Contractor's option. Obtain LWC Project Manager's acceptance of system and spacing of ties prior to ordering or purchase of forming. Clean, fill and seal form tie hole with non-shrink cement grout. The Contractor shall be responsible for watertightness of the form ties and any repairs needed.

PART 3 EXECUTIONS

3.01 GENERAL

- A. Forms shall be used for all cast-in-place concrete including sides of footings. Forms shall be constructed and placed so that the resulting concrete will be of the shape, lines, dimensions and appearance indicated on the Drawings.
- B. Forms for walls shall have removable panels at the bottom for cleaning, inspection and joint surface preparation. Forms for walls of considerable height shall have closable intermediate inspection ports. Tremies and hoppers for placing concrete shall be used to allow concrete inspection, prevent segregation and prevent the accumulation of hardened concrete on the forms above the fresh concrete.
- C. Molding, bevels, or other types of chamfer strips shall be placed to produce blockouts, rustications, or chamfers as shown on the Drawings or as specified herein. Chamfer strips shall be provided at horizontal and vertical projecting corners to produce a ¾-in chamfer. Rectangular or trapezoidal moldings shall be placed in locations requiring sealants where specified or shown on the Drawings. Sizes of moldings shall conform to the sealant manufacturer's recommendations.
- D. Forms shall be sufficiently rigid to withstand construction loads and vibration and to prevent displacement or sagging between supports. Construct forms so that the concrete will not be damaged by their removal. The Contractor shall be entirely responsible for the adequacy of the forming system.
- E. Before form material is re-used, all surfaces to be in contact with concrete shall be thoroughly cleaned, all damaged places repaired, all projecting nails withdrawn and all protrusions

smoothed. Reuse of wooden forms for other than rough finish will be permitted only if a "like new" condition of the form is maintained.

3.02 FORM TOLERANCES

- A. Forms shall be surfaced, designed and constructed in accordance with the recommendations of ACI 347 and shall meet the following additional requirements for the specified finishes.
- B. Formed Surface Exposed to View: Edges of all form panels in contact with concrete shall be flush within 1/32-in and forms for plane surfaces shall be such that the concrete will be plane within 1/16-in in 4-ft. Forms shall be tight to prevent the passage of mortar, water and grout. The maximum deviation of the finish wall surface at any point shall not exceed 1/4-in from the intended surface as shown on the Drawings. Form panels shall be arranged symmetrically and in an orderly manner to minimize the number of seams.
- C. Formed surfaces not exposed to view or buried shall meet requirements of Class "C" Surface in ACI 347.
- D. Formed rough surfaces including mass concrete, pipe encasement, electrical duct encasement and other similar installations shall have no minimum requirements for surface smoothness and surface deflections. The overall dimensions of the concrete shall be plus or minus 1-in.
- E. Formed concrete Surfaces to Receive Paint: Surface deflections shall be limited to 1/32-in at any point and the variation in wall deflection shall not exceed 1/16-in per 4-ft. The maximum deviation of the finish wall surface at any point shall not exceed 1/4-in from the intended surface as shown on the Drawings.

3.03 FORM PREPARATION

- A. Wood forms in contact with the concrete shall be coated with an effective release agent prior to form installation.
- B. Steel forms shall be thoroughly cleaned and mill scale and other ferrous deposits shall be sandblasted or otherwise removed from the contact surface for all forms, except those utilized for surfaces receiving a rough finish. All forms shall have the contact surfaces coated with a release agent.
- C. Form liners to be installed for architectural concrete finish shall be in accordance to the manufacturer recommendations.

3.04 REMOVAL OF FORMS

- A. The Contractor shall be responsible for all damage resulting from removal of forms. Forms and shoring for structural slabs or beams shall remain in place in accordance with ACI 301 and ACI 347. Form removal shall conform to the requirements specified in Section 03300.

3.05 INSPECTION

- A. The LWC Project Manager via the KYTC Resident Engineer shall be notified when the forms are complete and ready for inspection at least 6 hours prior to the proposed concrete placement.
- B. Failure of the forms to comply with the requirements specified herein or to produce concrete complying with requirements of this Section shall be grounds for rejection of that portion of the

concrete work. Rejected work shall be repaired or replaced as directed by the LWC Project Manager or the KYTC Resident Engineer at no additional cost to the Louisville Water Company. Such repair or replacement shall be subject to the requirements of this Section and approval of the LWC Project Manager and the KYTC Resident Engineer.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install all concrete reinforcement complete as shown on the Drawings and as specified herein.
- B. Furnish only all deformed steel reinforcement required to be entirely built into concrete masonry unit construction.

1.02 RELATED WORK

- A. Concrete Formwork is included in Section 03100.
- B. Cast-in-place Concrete is included in Section 03300.
- C. Grout is included in Section 03600.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Reinforcing steel. Placement drawings shall conform to the recommendations of ACI 315. All reinforcement in a concrete placement shall be included on a single placement drawing or cross-referenced to the pertinent main placement drawing. The main drawing shall include the additional reinforcement (around openings, at corners, etc) shown on the standard detail sheets. Bars to have special coatings and/or to be of special steel or special yield strength are to be clearly identified.
 - 2. Bar bending details. The bars shall be referenced to the same identification marks shown on the placement drawings. Bars to have special coatings and/or to be of special steel or special yield strength shall be clearly identified.
- B. Submit Test Reports, in accordance with Section 01300, of each of the following items.
 - 1. Certified copy of mill test on each steel proposed for use showing the physical properties of the steel and the chemical analysis.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A184 – Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
 - 2. ASTM A185 – Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement

3. ASTM A497 – Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
 4. ASTM A615 – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- B. American Concrete Institute (ACI)
1. ACI 301 – Standard Specification for Structural Concrete
 2. ACI 315 – Details and Detailing of Concrete Reinforcement.
 3. ACI 318 – Building Code Requirements for Structural Concrete
 4. ACI SP-66 – ACI Detailing Manual
- C. Concrete Reinforcing Steel Institute (CRSI)
1. Manual of Standard Practice
- D. American Welding Society (AWS)
1. AWS D1.4 – Structural Welding Code Reinforcing Steel
- E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.
- 1.05 DELIVERY, HANDLING AND STORAGE
- A. Reinforcing steel shall be substantially free from mill scale, rust, dirt, grease, or other foreign matter.
 - B. Reinforcing steel shall be shipped and stored with bars of the same size and shape fastened in bundles with durable tags, marked in a legible manner with waterproof markings showing the same "mark" designations as those shown on the submitted Placing Drawings.
 - C. Reinforcing steel shall be stored off the ground, protected from moisture and kept free from dirt, oil, or other injurious contaminants.
 - D. Coated reinforcing steel shall be stored on padded wooden or steel cribbing. Coatings damaged by fabrication, handling or installation shall be repaired to conform to the applicable coating requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials shall be new, of domestic manufacture and shall comply with the following material specifications.
- B. Deformed Concrete Reinforcing Bars: ASTM A615, Grade 60 deformed bars.

- C. Welded Steel Wire Fabric: ASTM A185.
- D. Welded Deformed Steel Wire Fabric: ASTM A497.
- E. Reinforcing Steel Accessories
 - 1. Plastic Protected Bar Supports: CRSI Bar Support Specifications, Class 1 - Maximum Protection.
 - 2. Precast Concrete Block Bar Supports: CRSI Bar Support Specifications, Precast Blocks. Blocks shall have equal or greater strength than the surrounding concrete.
- F. Tie Wire
 - 1. Tie Wires for Reinforcement shall be 16-gauge or heavier, black annealed wire.

2.02 FABRICATION

- A. Fabrication of reinforcement shall be in compliance with the CRSI Manual of Standard Practice.
- B. Bars shall be cold bent. Bars shall not be straightened or rebent.
- C. Bars shall be bent around a revolving collar having a diameter of not less than that recommended by the ACI 318.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Surface condition, bending, spacing and tolerances of placement of reinforcement shall comply with the CRSI Manual of Standard Practice. The Contractor shall be solely responsible for providing an adequate number of bars and maintaining the spacing and clearances shown on the Drawings.
- B. Except as otherwise indicated on the Drawings, the minimum concrete cover of reinforcement shall be as follows:
 - 1. Concrete cast against and permanently exposed to earth: 3-in
 - 2. Concrete exposed to soil, water, sewage, sludge and/or weather: 2-in (including bottom cover of slabs over water or sewage)
 - 3. Concrete not exposed to soil, water, sewage, sludge and/or weather:
 - a. Slabs (top and bottom cover), walls, joists, shells and folded plate members - 1-in
 - b. Beams and columns (principal reinforcement, ties, spirals and stirrups) - 1½-in
- C. Reinforcement which will be exposed for a considerable length of time after being placed shall be coated with a heavy coat of neat cement slurry.
- D. No reinforcing steel bars shall be welded either during fabrication or erection unless specifically shown on the Drawings or specified herein, or unless prior written approval has been obtained

from the LWC Project Manager. All bars that have been welded, including tack welds, without such approval shall be immediately removed from the work. When welding of reinforcement is approved or called for, it shall comply with AWS D1.4.

- E. Reinforcing steel interfering with the location of other reinforcing steel, conduits or embedded items, may be moved within the specified tolerances or one bar diameter, whichever is greater. Greater displacement of bars to avoid interference, shall only be made with the approval of the LWC Project Manager and the KYTC Resident Engineer. Do not cut reinforcement to install inserts, conduits, mechanical openings or other items without the prior approval of the LWC Project Manager.
- F. Securely support and tie reinforcing steel to prevent movement during concrete placement. Secure dowels in place before placing concrete.
- G. Reinforcing steel bars shall not be field bent except where shown on the Drawings or specifically authorized in writing by the LWC Project Manager. If authorized, bars shall be cold-bent around the standard diameter spool specified in the CRSI. Do not heat bars. Closely inspect the reinforcing steel for breaks. If the reinforcing steel is damaged, replace, Cadweld or otherwise repair as directed by the LWC Project Manager. Do not bend reinforcement after it is embedded in concrete [unless specifically shown otherwise on the Drawings].

3.02 REINFORCEMENT AROUND OPENINGS

- A. Unless specific additional reinforcement around openings is shown on the Drawings, provide additional reinforcing steel on each side of the opening equivalent to one half of the cross-sectional area of the reinforcing steel interrupted by an opening. The bars shall have sufficient length to develop bond at each end beyond the opening or penetration.

3.03 SPLICING OF REINFORCEMENT

- A. Splices designated as compression splices on the Drawings, unless otherwise noted, shall be 30 bar diameters, but not less than 12-in. The lap splice length for column vertical bars shall be based on the bar size in the column above.
- B. Tension lap splices shall be provided at all laps in compliance with ACI 318. [Splices in adjacent bars shall be staggered]. Class A splices may be used when 50 percent or less of the bars are spliced within the required lap length. Class B splices shall be used at all other locations.
- C. Except as otherwise indicated on the Drawings, splices in circumferential reinforcement in circular walls shall be Class B tension splices and shall be staggered. Adjacent bars shall not be spliced within the required lap length.
- D. Install wire fabric in as long lengths as practicable. Wire fabric from rolls shall be rolled flat and firmly held in place. Splices in welded wire fabric shall be lapped in accordance with the requirements of ACI-318 but not less than 12-in. The spliced fabrics shall be tied together with wire ties spaced not more than 24-in on center and laced with wire of the same diameter as the welded wire fabric. Do not position laps midway between supporting beams, or directly over beams of continuous structures. Offset splices in adjacent widths to prevent continuous splices.

3.04 ACCESSORIES

- A. Determine, provide and install accessories such as chairs, chair bars and the like in sufficient quantities and strength to adequately support the reinforcement and prevent its displacement during the erection of the reinforcement and the placement of concrete.
- B. Use precast concrete blocks where the reinforcing steel is to be supported over soil.
- C. Alternate methods of supporting top steel in slabs, such as steel channels supported on the bottom steel or vertical reinforcing steel fastened to the bottom and top mats, may be used if approved by the LWC Project Manager.

3.05 INSPECTION

- A. In no case shall any reinforcing steel be covered with concrete until the installation of the reinforcement, including the size, spacing and position of the reinforcement has been observed by the LWC Project Manager and the KYTC Resident Engineer and the LWC Project Manager's release to proceed with the concreting has been obtained. The LWC Project Manager and the KYTC Resident Engineer shall be given ample prior notice of the readiness of placed reinforcement for observation. The forms shall be kept open until the LWC Project Manager and the KYTC Resident Engineer has finished his/her observations of the reinforcing steel.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor and materials required and install cast-in-place concrete complete as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Concrete Formwork is included in Section 03100.
- B. Concrete Reinforcement is included in Section 03200.
- C. Concrete Finishes are included in Section 03350.
- D. Grout is included in Section 03600.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data including the following:
 - 1. Sources of cement and aggregates.
 - 2. Air-entraining admixture. Product data including catalogue cut, technical data, storage requirements, product life, recommended dosage, temperature considerations and conformity to ASTM standards.
 - 3. Water-reducing admixture. Product data including catalogue cut, technical data, storage requirements, product life, recommended dosage, temperature considerations and conformity to ASTM standards.
 - 4. Sheet curing material. Product data including catalogue cut, technical data and conformity to ASTM standard.
- B. Samples
 - 1. Fine and coarse aggregates if requested by the LWC Project Manager.
- C. Test Reports
 - 1. Sieve analysis, mechanical properties and deleterious substance content for coarse and fine aggregate.
 - 2. Chemical analysis and physical tests of cement.

3. Concrete mix for each formulation of concrete proposed for use including constituent quantities per cubic yard, water cementitious ratio, concrete slump, type and manufacturer of cement.
 - a. Standard deviation data for each proposed concrete mix based on statistical records.
 - b. Water cementitious ratio curve for concrete mixes based on laboratory tests. Give average cylinder strength test results at 7 and 28 days for laboratory concrete mix designs. Provide results of 14 day tests if available.

D. Certifications

1. Certify that admixtures used in the same concrete mix are compatible with each other and the aggregates.
2. Certify that the Contractor is not associated with the independent testing laboratory proposed to be used by him/her nor does the Contractor or his/her officers have a beneficial interest in the laboratory.

E. Qualifications

1. Independent testing laboratory: Name, address and qualifications of laboratory proposed to be used by the Contractor. Laboratories affiliated with the Contractor or in which the Contractor or his/her officers have a beneficial interest are not acceptable.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
2. ASTM C33 – Standard Specification for Concrete Aggregates.
3. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
5. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
6. ASTM C143 – Standard Test Method for Slump of Hydraulic Cement Concrete
7. ASTM C150 – Standard Specification for Portland Cement.
8. ASTM C171 – Standard Specification for Sheet Materials for Curing Concrete.
9. ASTM C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

11. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.

12. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.

B. American Concrete Institute (ACI).

1. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.

2. ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.

3. ACI 304.2R – Placing Concrete by Pumping Methods.

4. ACI 305R – Hot Weather Concreting.

5. ACI 306R – Cold Weather Concreting.

6. ACI 318 – Building Code Requirements for Reinforced Concrete.

7. ACI 350R – Environmental Engineering Concrete Structures.

C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. Reinforced concrete shall comply with ACI 318, the recommendations of ACI 350R and other stated requirements, codes and standards. The most stringent requirement of the codes, standards and this Section shall apply when conflicts exist.

B. Only one source of cement and aggregates shall be used on any one structure. Concrete shall be uniform in color and appearance.

C. Well in advance of placing concrete, discuss with the LWC Project Manager and the KYTC Resident Engineer the sources of individual materials and batched concrete proposed for use. Discuss placement methods, waterstops and curing. Propose methods of hot and cold weather concreting as required.

D. If, during the progress of the work, it is impossible to secure concrete of the required workability and strength with the materials being furnished, the LWC Project Manager or the KYTC Resident Engineer may order such changes in proportions or materials, or both, as may be necessary to secure the desired properties. All changes so ordered shall be made at the Contractor's expense.

E. If, during the progress of the work, the materials from the sources originally accepted change in characteristics, the Contractor shall, at his/her expense, make new acceptance tests of aggregates and establish new design mixes. Such testing and design shall be accomplished with the assistance of an Independent Testing Laboratory acceptable to the LWC Project Manager and the KYTC Resident Engineer.

F. Testing of the following materials shall be furnished by Contractor to verify conformity with this Specification Section and the stated ASTM Standards.

1. Fine aggregates for conformity with ASTM C33 – sieve analysis, physical properties, and deleterious substances.
 2. Coarse aggregates for conformity with ASTM C33 – sieve analysis, physical properties, and deleterious substances.
 3. Cements for conformity with ASTM C150 – chemical analysis and physical properties.
 4. Pozzolans for conformity with ASTM C618 – chemical analysis and physical properties.
 5. Proposed concrete mix designs – compressive strength, slump, and air content.
- G. Field testing and inspection services will be provided by the Contractor. The cost of such work, except as specifically stated otherwise, shall be paid by the Contractor. Testing of the following items shall be by the Owner to verify conformity with this Specification Section.
1. Concrete placements – compressive strength (cylinders), compressive strength (cores), slump, and air content.
 2. Other materials or products that may come under question.
- H. All materials incorporated in the work shall conform to accepted samples.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Cement: Store in weathertight buildings, bins or silos to provide protection from dampness and contamination and to minimize warehouse set.
- B. Aggregate: Arrange and use stockpiles to avoid excessive segregation or contamination with other materials or with other sizes of like aggregates. Build stockpiles in successive horizontal layers not exceeding 3-ft in thickness. Complete each layer before the next is started. Do not use frozen or partially frozen aggregate.
- C. Sand: Arrange and use stockpiles to avoid contamination. Allow sand to drain to a uniform moisture content before using. Do not use frozen or partially frozen aggregates.
- D. Admixtures: Store in closed containers to avoid contamination, evaporation or damage. Provide suitable agitating equipment to assure uniform dispersion of ingredients in admixture solutions which tend to separate. Protect liquid admixtures from freezing and other temperature changes which could adversely affect their characteristics.
- E. Sheet Curing Materials: Store in weathertight buildings or off the ground and under cover.

PART 2 PRODUCTS

2.01 GENERAL

- A. The use of manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- B. Like items of materials shall be the end products of one manufacturer in order to provide standardization for appearance, maintenance and manufacturer's service.

2.02 MATERIALS

- A. Materials shall comply with this Section and any applicable State or local requirements.
- B. Cement: Domestic Portland cement complying with ASTM C150. Air entraining cements shall not be used. Cement brand shall be subject to approval by the LWC Project Manager and one brand shall be used throughout the Work. The following cement type(s) shall be used:
- C. Fine Aggregate: Washed inert natural sand conforming to the requirements of ASTM C33.
- D. Coarse Aggregate: Well-graded crushed stone or washed gravel conforming to the requirements of ASTM C33. Grading requirements shall be as listed in ASTM C33 Table 2 for the specified coarse aggregate size number. Limits of Deleterious Substances and Physical Property Requirements shall be as listed in ASTM C33 Table 3 for severe weathering regions. Size numbers for the concrete mixes shall be as shown in Table 1 herein.
- E. Water: Potable water free from injurious amounts of oils, acids, alkalis, salts, organic matter, or other deleterious substances.
- F. Admixtures: Admixtures shall be free of chlorides and alkalis (except for those attributable to water). When it is required to use more than one admixture in a concrete mix, the admixtures shall be from the same manufacturer. Admixtures shall be compatible with the concrete mix including other admixtures and shall be suitable for use in contact with potable water after 30 days of concrete curing.
 - 1. Air-Entraining Admixture: The admixture shall comply with ASTM C260. Proportioning and mixing shall be in accordance with manufacturer's recommendations.
 - 2. Water-Reducing Agent: The admixture shall comply with ASTM C494, Type A. Proportioning and mixing shall be in accordance with manufacturer's recommendations.
 - 3. Admixtures causing retarded or accelerated setting of concrete shall not be used without written approval from the LWC Project Manager. When allowed, the admixtures shall be retarding or accelerating water reducing or high range water reducing admixtures.
- G. Sheet Curing Materials. Waterproof paper, polyethylene film or white burlap-polyethylene sheeting all complying with ASTM C171.

2.03 MIXES

- A. Development of mix designs and testing shall be by an independent testing laboratory acceptable to the LWC Project Manager engaged by and at the expense of the Contractor.
- B. Select proportions of ingredients to meet the design strength and materials limits specified in Table 1 and to produce concrete having proper placability, durability, strength, appearance and other required properties. Proportion ingredients to produce a homogenous mixture which will readily work into corners and angles of forms and around reinforcement without permitting materials to segregate or allowing excessive free water to collect on the surface.
- C. The design mix shall be based on standard deviation data of prior mixes with essentially the same proportions of the same constituents or, if such data is not available, be developed by a testing laboratory, acceptable to the LWC Project Manager and the KYTC Resident Engineer,

engaged by and at the expense of the Contractor. Acceptance of mixes based on standard deviation shall be based on the modification factors for standard deviation tests contained in ACI 318. The water content of the concrete mix, determined by laboratory testing, shall be based on a curve showing the relation between water cementitious ratio and 7 and 28 day compressive strengths of concrete made using the proposed materials. The curves shall be determined by four or more points, each representing an average value of at least three test specimens at each age. The curves shall have a range of values sufficient to yield the desired data, including the specified design strengths as modified below, without extrapolation. The water content of the concrete mixes to be used, as determined from the curve, shall correspond to strengths 16 percent greater than the specified design strengths. The resulting mix shall not conflict with the limiting values for maximum water cementitious ratio and net minimum cementitious content as specified in Table 1.

- D. Compression Tests: Provide testing of the proposed concrete mix or mixes to demonstrate compliance with the specified design strength requirements in conformity with the above paragraph.
- E. Entrained air, as measured by ASTM C231, shall be as shown in Table 1.
 - 1. If the air-entraining agent proposed for use in the mix requires testing methods other than ASTM C231 to accurately determine air content, make special note of this requirement in the admixture submittal required under Paragraph 1.03.
- F. Slump of the concrete as measured by ASTM C143, shall be as shown in Table 1.
- G. Proportion admixtures according to the manufacturer's recommendations. Two or more admixtures specified may be used in the same mix provided that the admixtures in combination retain full efficiency and have no deleterious effect on the concrete or on the properties of each other.

TABLE 1

CONCRETE MIX REQUIREMENTS

Class	Design Strength (1)	Cement (2)	Fine Aggregate (2)	Coarse Aggregate (3)	Cementitious Content (4)
A	2500	C150 Type II	C33	57	440 min.
B	5000	C150 Type I/II	C33	67	564 min.
C	4000	C150 Type II	C33	67	590 min.

Class	W/C Ratio (5)	Fly Ash	AE Range (6)	WR (7)	Slump Range Inches
A	0.62 max.	--	3.5 to 5	Yes	1-4
B	0.42 max.	--	4 to 6	Yes	4
C	0.44 max.	--	3.5 to 5	Yes	3-5

NOTES:

- (1) Minimum compressive strength in psi at 28 days
- (2) ASTM designation
- (3) Size Number in ASTM C33
- (4) Cementitious content in lbs/cu yd
- (5) W/C is Water-Cementitious ratio by weight
- (6) AE is percent air-entrainment
- (7) WR is water-reducer admixture

PART 3 EXECUTIONS

3.01 MEASURING MATERIALS

- A. Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, water and admixtures as specified and shall be produced by a plant acceptable to the LWC Project Manager and the KYTC Resident Engineer. All constituents, including admixtures, shall be batched at the plant.
- B. Measure materials for batching concrete by weighing in conformity with and within the tolerances given in ASTM C94 except as otherwise specified. Scales shall have been certified by the local Sealer of Weights and Measures within 1 year of use.
- C. Measure the amount of free water in fine aggregates within 0.3 percent with a moisture meter. Compensate for varying moisture contents of fine aggregates. Record the number of gallons of water as-batched on printed batching tickets.
- D. Admixtures shall be dispensed either manually using calibrated containers or measuring tanks, or by means of an automatic dispenser approved by the manufacturer of the specific admixture.
 - 1. Charge air-entraining and chemical admixtures into the mixer as a solution using an automatic dispenser or similar metering device.
 - 2. Inject multiple admixtures separately during the batching sequence.

3.02 MIXING AND TRANSPORTING

- A. Concrete shall be ready-mixed concrete produced by equipment acceptable to the LWC Project Manager and the KYTC Resident Engineer. No hand-mixing will be permitted. Clean each transit mix truck drum and reverse drum rotation before the truck proceeds under the batching plant. Equip each transit-mix truck with a continuous, nonreversible, revolution counter showing the number of revolutions at mixing speeds.
- B. Ready-mix concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of their rated capacities as stated on the name plate.
- C. Keep the water tank valve on each transit truck locked at all times. Any addition of water must be directed by the LWC Project Manager. Added water shall be incorporated by additional mixing of at least 35 revolutions. All added water shall be metered and the amount of water added shall be shown on each delivery ticket.
- D. All central plant and rolling stock equipment and methods shall comply with ACI 318 and ASTM C94.
- E. Select equipment of size and design to ensure continuous flow of concrete at the delivery end. Metal or metal-lined non-aluminum discharge chutes shall be used and shall have slopes not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20-ft long and chutes not meeting slope requirements may be used if concrete is discharged into a hopper before distribution.
- F. Retempering (mixing with or without additional cement, aggregate, or water) of concrete or mortar which has reached initial set will not be permitted.

- G. Handle concrete from mixer to placement as quickly as practicable while providing concrete of required quality in the placement area. Dispatch trucks from the batching plant so they arrive at the work site just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.
- H. Furnish a delivery ticket for ready mixed concrete to the LWC Project Manager or the KYTC representative as each truck arrives. Each ticket shall provide a printed record of the weight of cement and each aggregate as batched individually. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Clearly indicate the weight of fine and coarse aggregate, cement and water in each batch, the quantity delivered, the time any water is added, and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of the truck mixer.
- I. Temperature and Mixing Time Control
 - 1. In cold weather, do not allow the as-mixed temperature of the concrete and concrete temperatures at the time of placement in the forms to drop below 40 degrees F.
 - 2. If water or aggregate has been heated, combine water with aggregate in the mixer before cement is added. Do not add cement to mixtures of water and aggregate when the temperature of the mixture is greater than 90 degrees F.
 - 3. In hot weather, cool ingredients before mixing to maintain temperature of the concrete below the maximum placing temperature of 90 degrees F. If necessary, substitute well-crushed ice for all or part of the mixing water.
 - 4. The maximum time interval between the addition of mixing water and/or cement to the batch and the placing of concrete in the forms shall not exceed the values shown in Table 2.

TABLE 2

MAXIMUM TIME TO DISCHARGE OF CONCRETE

<u>Air or Concrete Temperature (whichever is higher)</u>	<u>Maximum Time</u>
80 to 90 Degree F (27 to 32 Degree C).....	45 minutes
70 to 79 Degree F (21 to 26 Degree C).....	60 minutes
40 to 69 Degree F (5 to 20 Degree C).....	90 minutes

If an approved high-range water-reducer (plasticizer) is used to produce plasticized concrete, the maximum time interval shall not exceed 90 minutes.

3.03 CONCRETE APPEARANCE

- A. Concrete mix showing either poor cohesion or poor coating of the coarse aggregate with paste shall be remixed. If this does not correct the condition, the concrete shall be rejected. If the slump is within the allowable limit, but excessive bleeding, poor workability, or poor finishability are observed, changes in the concrete mix shall be obtained only by adjusting one or more of the following:
 - 1. The gradation of aggregate.
 - 2. The proportion of fine and coarse aggregate.
 - 3. The percentage of entrained air, within the allowable limits.
- B. Concrete for the work shall provide a homogeneous structure which, when hardened, will have the required strength, durability and appearance. Mixtures and workmanship shall be such that concrete surfaces, when exposed, will require no finishing. When concrete surfaces are stripped, the concrete, when viewed in good lighting from 10-ft away, shall be pleasing in appearance, and at 20-ft shall show no visible defects.

3.04 PLACING AND COMPACTING

- A. Placing
 - 1. Verify that all formwork completely encloses concrete to be placed and is securely braced prior to concrete placement. Remove ice, excess water, dirt and other foreign materials from forms. Confirm that reinforcement and other embedded items are securely in place. Have a competent workman at the location of the placement who can assure that reinforcing steel and embedded items remain in designated locations while concrete is being placed. Sprinkle semi-porous subgrades or forms to eliminate suction of water from the mix. Seal extremely porous subgrades in an approved manner.
 - 2. Deposit concrete as near its final position as possible to avoid segregation due to rehandling or flowing. Place concrete continuously at a rate which ensures the concrete is being integrated with fresh plastic concrete. Do not deposit concrete which has partially hardened or has been contaminated by foreign materials or on concrete which has hardened sufficiently to cause formation of seams or planes of weakness within the section. If the section cannot be placed continuously, place construction joints as specified or as approved.
 - 3. Pumping of concrete will be permitted. Use a mix design and aggregate sizes suitable for pumping and submit for approval.
 - 4. Remove temporary spreaders from forms when the spreader is no longer useful. Temporary spreaders may remain embedded in concrete only when made of galvanized metal or concrete and if prior approval has been obtained.
 - 5. Do not place concrete for supported elements until concrete previously placed in the supporting element (columns, slabs and/or walls) has reached adequate strength.
 - 6. Where surface mortar is to form the base of a finish, especially surfaces designated to be painted, work coarse aggregate back from forms with a suitable tool to bring the full surface of the mortar against the form. Prevent the formation of excessive surface voids.

7. Slabs

- a. After suitable bulkheads, screeds and jointing materials have been positioned, the concrete shall be placed continuously between construction joints beginning at a bulkhead, edge form, or corner. Each batch shall be placed into the edge of the previously placed concrete to avoid stone pockets and segregation.
- b. Avoid delays in casting. If there is a delay in casting, the concrete placed after the delay shall be thoroughly spaded and consolidated at the edge of that previously placed to avoid cold joints. Concrete shall then be brought to correct level and struck off with a straightedge. Bullfloats or darbies shall be used to smooth the surface, leaving it free of humps or hollows.
- c. Where slabs are to be placed integrally with the walls below them, place the walls and compact as specified. Allow 1 hour to pass between placement of the wall and the overlying slab to permit consolidation of the wall concrete. Keep the top surface of the wall moist so as to prevent cold joints.

8. Formed Concrete

- a. Place concrete in forms using tremie tubes and taking care to prevent segregation. Bottom of tremie tubes shall preferably be in contact with the concrete already placed. Do not permit concrete to drop freely more than 4-ft. Place concrete for walls in 12 to 24-in lifts, keeping the surface horizontal. If plasticized concrete is used, the maximum lift thickness may be increased to 7-ft and the maximum free fall of concrete shall not exceed 15-ft.

B. Compacting

1. Consolidate concrete by vibration, puddling, spading, rodding or forking so that concrete is thoroughly worked around reinforcement, embedded items and openings and into corners of forms. Puddling, spading, etc, shall be continuously performed along with vibration of the placement to eliminate air or stone pockets which may cause honeycombing, pitting or planes of weakness.
2. All concrete shall be placed and compacted with mechanical vibrators. The number, type and size of the units shall be approved by the LWC Project Manager in advance of placing operations. No concrete shall be ordered until sufficient approved vibrators (including standby units in working order) are on the job.
3. A minimum frequency of 5000 rpm is required for mechanical vibrators. Insert vibrators and withdraw at points from 18 to 30-in apart. At each insertion, vibrate sufficiently to consolidate concrete, generally from 5 to 15 seconds. Do not over vibrate so as to segregate. Keep a spare vibrator on the site during concrete placing operations.
4. Concrete Slabs: Concrete for slabs less than 8-in thick shall be consolidated with vibrating screeds; slabs 8 to 12-in thick shall be compacted with internal vibrators and (optionally) with vibrating screeds. Vibrators shall always be placed into concrete vertically and shall not be laid horizontally or laid over.
5. Walls and Columns: Internal vibrators (rather than form vibrators) shall be used unless otherwise approved by the LWC Project Manager. In general, for each vibrator needed to

melt down the batch at the point of discharge, one or more additional vibrators must be used to densify, homogenize and perfect the surface. The vibrators shall be inserted vertically at regular intervals, through the fresh concrete and slightly into the previous lift, if any.

6. Amount of Vibration: Vibrators are to be used to consolidate properly placed concrete but shall not be used to move or transport concrete in the forms. Vibration shall continue until:
 - a. Frequency returns to normal.
 - b. Surface appears liquefied, flattened and glistening.
 - c. Trapped air ceases to rise.
 - d. Coarse aggregate has blended into surface, but has not disappeared.

3.05 CURING AND PROTECTION

- A. Protect all concrete work against injury from the elements and defacements of any nature during construction operations.
- B. Curing Methods
 1. Curing Methods for Concrete Surfaces: Cure concrete to retain moisture and maintain specified temperature at the surface for a minimum of 7 days after placement. Curing methods to be used are as follows:
 - a. Water Curing: Keep entire concrete surface wet by ponding, continuous sprinkling or covered with saturated burlap. Begin wet cure as soon as concrete attains an initial set and maintain wet cure 24 hours a day.
 - b. Sheet Material Curing: Cover entire surface with sheet material. Securely anchor sheeting to prevent wind and air from lifting the sheeting or entrapping air under the sheet. Place and secure sheet as soon as initial concrete set occurs.
 - c. Liquid Membrane Curing: Apply over the entire concrete surface except for surfaces to receive additional concrete. Curing compound shall NOT be placed on any concrete surface where additional concrete is to be placed, where concrete sealers or surface coatings are to be used, or where the concrete finish requires an integral floor product. Curing compound shall be applied as soon as the free water on the surface has disappeared and no water sheen is visible, but not after the concrete is dry or when the curing compound can be absorbed into the concrete. Application shall be in compliance with the manufacturer's recommendations.
 2. Specified applications of curing methods.
 - a. Slabs for Water Containment Structures: Water curing only.
 - b. Structural Slabs (other than water containment): Water curing or liquid membrane curing.
 - c. Formed Surfaces: None if nonabsorbent forms are left in place 7 days. Water cure if absorbent forms are used. Sheet cured or liquid membrane cured if forms are removed

prior to 7 days. Exposed horizontal surfaces of formed walls or columns shall be water cured for 7 days or until next placement of concrete is made.

- d. Concrete Joints: Water cured or sheet material cured.
- C. Finished surfaces and slabs shall be protected from the direct rays of the sun to prevent checking and crazing.
- D. Cold Weather Concreting:
1. "Cold weather" is defined as a period when for more than 3 successive days, the average daily outdoor temperature drops below 40 degrees F. The average daily temperature shall be calculated as the average of the highest and the lowest temperature during the period from midnight to midnight.
 2. Cold weather concreting shall conform to ACI 306.1 and the additional requirements specified herein. Temperatures at the concrete placement shall be recorded at 12-hour intervals (minimum).
 3. Discuss a cold weather work plan with the LWC Project Manager. The discussion shall encompass the methods and procedures proposed for use during cold weather including the production, transportation, placement, protection, curing and temperature monitoring of the concrete. The procedures to be implemented upon abrupt changes in weather conditions or equipment failures shall also be discussed. Cold weather concreting shall not begin until the work plan is acceptable to the LWC Project Manager.
 4. During periods of cold weather, concrete shall be protected to provide continuous warm, moist curing (with supplementary heat when required) for a total of at least 350 degree-days of curing.
 - a. Degree-days are defined as the total number of 24 hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (eg: 5 days at an average 70 degrees F = 350 degree-days).
 - b. To calculate the weighted average daily air temperature, sum hourly measurements of the air temperature in the shade at the surface of the concrete taking any measurement less than 50 degrees F as 0 degrees F. Divide the sum thus calculated by 24 to obtain the weighted average temperature for that day.
 5. Salt, manure or other chemicals shall not be used for protection.
 6. The protection period for concrete being water cured shall not be terminated during cold weather until at least 24 hours after water curing has been terminated.
- E. Hot Weather Concreting
1. "Hot weather" is defined as any combination of high air temperatures, low relative humidity and wind velocity which produces a rate of evaporation estimated in accordance with ACI 305R, approaching or exceeding 0.2 lbs/sqft/hr).
 2. Concrete placed during hot weather, shall be batched, delivered, placed, cured and protected in compliance with the recommendations of ACI 305R and the additional requirements specified herein.

- a. Temperature of concrete being placed shall not exceed 90 degrees F and every effort shall be made to maintain a uniform concrete mix temperature below this level. The temperature of the concrete shall be such that it will cause no difficulties from loss of slump, flash set or cold joints.
 - b. All necessary precautions shall be taken to promptly deliver, to promptly place the concrete upon its arrival at the job and to provide vibration immediately after placement.
 - c. The LWC Project Manager or the KYTC Representative may direct the Contractor to immediately cover plastic concrete with sheet material.
3. Discuss with the LWC Project Manager and the KYTC Resident Engineer a work plan describing the methods and procedures proposed to use for concrete placement and curing during hot weather periods. Hot weather concreting shall not begin until the work plan is acceptable to the LWC Project Manager.

3.06 REMOVAL OF FORMS

- A. Except as otherwise specifically authorized by the LWC Project Manager and the KYTC Resident Engineer, forms shall not be removed before the concrete has attained a strength of at least 30 percent of its specified design strength, nor before reaching the following number of day-degrees of curing (whichever is the longer):

TABLE 3

MINIMUM TIME TO FORM REMOVAL

<u>Forms for</u>	<u>Degree Days</u>
Beams and slabs	500
Walls and vertical surfaces	100

(See definition of degree-days in Paragraph 3.05D above).

- B. Shores shall not be removed until the concrete has attained at least 60 percent of its specified design strength and also sufficient strength to support safely its own weight and construction live loads.

3.07 INSPECTION AND FIELD TESTING

- A. The batching, mixing, transporting, placing and curing of concrete shall be subject to the inspection of the LWC Project Manager and the KYTC Representative at all times. The Contractor shall advise the LWC Project Manager and the KYTC Resident Engineer of his/her readiness to proceed at least 24 hours prior to each concrete placement. The LWC Project Manager will inspect the preparations for concreting including the preparation of previously placed concrete, the reinforcing steel and the alignment, cleanliness and tightness of formwork. No placement shall be made without the inspection and acceptance of the LWC Project Manager.
- B. Sets of field control cylinder specimens will be taken by the Testing Laboratory Inspector during the progress of the work, in compliance with ASTM C31. The number of sets of

concrete test cylinders taken of each class of concrete placed each day shall not be less than one set per day, nor less than one set for each 150 cu yds. of concrete nor less than one set for each 5,000 sq ft of surface area for slabs or walls.

1. A "set" of test cylinders consists of four cylinders: one to be tested at 7 days and two to be tested and their strengths averaged at 28 days. The fourth may be used for a special test at 3 days or to verify strength after 28 days if 28-day test results are low.
 2. When the average 28 day compressive strength of the cylinders in any set falls below the specified design strength or below proportional minimum 7 day strengths (where proper relation between seven and 28 day strengths have been established by tests), proportions, water content, or temperature conditions shall be changed to achieve the required strengths.
- C. Cooperate in the making of tests by allowing free access to the work for the selection of samples, providing an insulated closed curing box for specimens, affording protection to the specimens against injury or loss through the operations and furnish material and labor required for the purpose of taking concrete cylinder samples. All shipping of specimens will be paid for by the Contractor. Curing boxes shall be acceptable to the LWC Project Manager and the KYTC Resident Engineer.
- D. Slump tests will be made in the field immediately prior to placing the concrete. Such tests shall be made in accordance with ASTM C143. If the slump is greater the specified range, the concrete shall be rejected.
- E. Air Content: Test for air content shall be made on a fresh concrete samples. Air content for concrete made of ordinary aggregates having low absorption shall be made in compliance with either the pressure method complying with ASTM C231 or by the volumetric method complying with ASTM C173. If lightweight aggregates or aggregates with high absorptions are used, the latter test method shall be used.
- F. The LWC Project Manager or the KYTC Resident Engineer may have cores taken from any questionable area in the concrete work such as construction joints and other locations as required for determination of concrete quality. The results of tests on such cores shall be the basis for acceptance, rejection or determining the continuation of concrete work.
- G. Cooperate in obtaining cores by allowing free access to the work and permitting the use of ladders, scaffolding and such incidental equipment as may be required. Repair all core holes. The work of cutting and testing the cores will be at the expense of the Owner.

3.08 FIELD CONTROL

- A. The LWC Project Manager or the KYTC Resident Engineer may have cores taken from any questionable area in the concrete work such as construction joints and other locations as required for determination of concrete quality. The results of tests on such cores shall be the basis for acceptance, rejection or determining the continuation of concrete work.
- B. The Contractor shall cooperate in obtaining cores by allowing free access to the Work and permitting the use of ladders, scaffolding and such incidental equipment as may be required. The Contractor shall repair all core holes. The work of cutting and testing the cores will be at the expense of the Owner.

3.09 FAILURE TO MEET REQUIREMENTS

- A. Should the strengths shown by the test specimens made and tested in compliance with the previous provisions fall below the values given in Table 1, the LWC Project Manager and the KYTC Resident Engineer shall have the right to require changes in proportions outlined to apply to the remainder of the work. Furthermore, the LWC Project Manager and the KYTC Resident Engineer shall have the right to require additional curing on those portions of the structure represented by the test specimens which failed. The cost of such additional curing shall be at the Contractor's expense. In the event that such additional curing does not give the strength required, as evidenced by core and/or load tests, the LWC Project Manager and the KYTC Resident Engineer shall have the right to require strengthening or replacement of those portions of the structure which fail to develop the required strength. The cost of all such core borings and/or load tests and any strengthening or concrete replacement required because strengths of test specimens are below that specified, shall be entirely at the expense of the Contractor. In such cases of failure to meet strength requirements the Contractor and LWC Project Manager and the KYTC Resident Engineer shall confer to determine what adjustment, if any, can be made in compliance with Sections titled "Strength" and "Failure to Meet Strength Requirements" of ASTM C94. The "purchaser" referred to in ASTM C94 is the Contractor in this Section.
- B. When the tests on control specimens of concrete fall below the specified strength, the LWC Project Manager and the KYTC Resident Engineer will permit check tests for strengths to be made by means of typical cores drilled from the structure in compliance with ASTM C42 and C39. In the case of cores not indicating adequate strength, the LWC Project Manager and the KYTC Resident Engineer, in addition to other recourses, may require, at the Contractor's expense, load tests on any one of the slabs, beams, piles, caps, and columns in which such concrete was used. Tests need not be made until concrete has aged 60 days.
- C. Should the strength of test cylinders fall below 60 percent of the required minimum 28 day strength, the concrete shall be rejected and shall be removed and replaced.

3.10 PATCHING AND REPAIRS

- A. It is the intent of this Section to require quality work including adequate forming, proper mixture and placement of concrete and curing so completed concrete surfaces will require no patching.
- B. As soon as the forms have been stripped and the concrete surfaces exposed, fins and other projections shall be removed; recesses left by the removal of form ties shall be filled; and surface defects which do not impair structural strength shall be repaired. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete, to approval of the LWC Project Manager.
- C. Immediately after removal of forms remove plugs and break off metal ties as required by Section 03100. Promptly fill holes upon stripping as follows: Moisten the hole with water, followed by a 1/16-in brush coat of neat cement slurry mixed to the consistency of a heavy paste. Immediately plug the hole with a 1 to 1.5 mixture of cement and concrete sand mixed slightly damp to the touch (just short of "balling"). Hammer the grout into the hole until dense, and an excess of paste appears on the surface in the form of a spiderweb. Trowel smooth with heavy pressure. Avoid burnishing.
- D. When patching exposed surfaces the same source of cement and sand as used in the parent concrete shall be employed. Adjust color if necessary by addition of proper amounts of white cement. Rub lightly with a fine Carborundum stone at an age of 1 to 5 days if necessary to bring the surface down with the parent concrete. Exercise care to avoid damaging or staining

the virgin skin of the surrounding parent concrete. Wash thoroughly to remove all rubbed matter.

3.11 SCHEDULE

- A. The following (Table 4) are the general applications for the various concrete classes and design strengths:

TABLE 4
CONCRETE SCHEDULE

<u>Class</u>	<u>Design Strength (psi)</u>	<u>Description</u>
A	2,500	Sidewalks
B	5,000	Walls, slabs on grade, suspended slab and beam systems, columns, grade beams and all other structural concrete
C	4,000	Walls, slabs on grade, suspended slab and beam systems, columns, grade beams, concrete encasement, thrust blocks and all other structural concrete

END OF SECTION

SECTION 03350

CONCRETE FINISHES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and finish cast-in-place concrete surfaces as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Concrete Formwork is included in Section 03100.
- B. Cast-In-Place Concrete is included in Section 03300.
- C. Grout is included in Section 03600.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Concrete sealer. Confirmation that the sealer is compatible with additionally applied coatings shall also be submitted.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C33 - Standard Specification for Concrete Aggregates.
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. Finishes
 - 1. For concrete which will receive additional applied finishes or materials, the surface finish specified is required for the proper application of the specified manufacturer's products. Where alternate products are approved for use, determine if changes in finishes are required and provide the proper finishes to receive these products.
 - 2. Changes in finishes made to accommodate products different from those specified shall be performed at no additional cost to the Louisville Water Company or KYTC. Submit the proposed new finishes and their construction methods to the LWC Project Manager via the KYTC Resident Engineer for approval.
- B. Services of Manufacturer's Representative

1. Make available at no extra cost to the Louisville Water Company or KYTC, upon 72 hours notification, the services of a qualified field representative of the manufacturer of curing compound, sealer or hardener to instruct the user on the proper application of the product under prevailing job conditions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Chemical hardener shall be Lapidolith by Sonneborn; Hornolith by A.C. Horn; Penalith by W.R. Meadows or equal fluosilicate base material.

PART 3 EXECUTION

3.01 FORMED SURFACES

- A. Forms shall not be removed before the requirements of Section 03300, have been satisfied.
- B. Exercise care to prevent damaging edges or obliterating the lines of chamfers, rustications or corners when removing the forms or performing any other work adjacent thereto.
- C. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete.
- D. Rough-Form Finish
 1. Immediately after stripping forms and before concrete has changed color, carefully remove all fins and projections.
 2. Promptly fill holes left by tie cones and defects as specified in Section 03300.
- E. Rubbed Finish
 1. Immediately upon stripping forms and before concrete has changed color, carefully remove all fins. While the wall is still damp apply a thin coat of medium consistency neat cement slurry by means of bristle brushes to provide a bonding coat within all pits, air holes or blemishes in the parent concrete. Avoid coating large areas with the slurry at one time.
 2. Before the slurry has dried or changed color, apply a dry (almost crumbly) grout proportioned by volume and consisting of 1 part cement to 1½ parts of clean masonry sand having a fineness modulus of approximately 2.3 and complying with the gradation requirements of ASTM C33 for such a material. Grout shall be uniformly applied by means of damp pads of coarse burlap approximately 6-in square used as a float. Scrub grout into the pits and air holes to provide a dense mortar in all imperfections.
 3. Allow the mortar to partially harden for 1 or 2 hours depending upon the weather. If the air is hot and dry, keep the wall damp during this period using a fine, fog spray. When the grout has hardened sufficiently so it can be scraped from the surface with the edge of a steel trowel without damaging the grout in the small pits or holes, cut off all that can be removed with a trowel. (Note: Grout allowed to remain on the wall too long will harden and will be difficult to remove.)
 4. Allow the surface to dry thoroughly and rub it vigorously with clean dry burlap to completely remove any dried grout. No visible film of grout shall remain after this rubbing. The entire cleaning operation for any area must be completed the day it is started.

Do not leave grout on surfaces overnight. Allow sufficient time for grout to dry after it has been cutoff with the trowel so it can be wiped off clean with the burlap.

5. On the day following the repair of pits, air holes and blemishes, the walls shall again be wiped off clean with dry, used pieces of burlap containing old hardened mortar which will act as a mild abrasive. After this treatment, there shall be no built-up film remaining on the parent surface. If, however, such a film is present, a fine abrasive stone shall be used to remove all such material without breaking through the surface film of the original concrete. Such scrubbing shall be light and sufficient only to remove excess material without changing the texture of the concrete.
6. A thorough wash-down with stiff bristle brushes shall follow the final bagging or stoning operation. No extraneous materials shall remain on the surface of the wall. The wall shall be sprayed with a fine fog spray periodically to maintain a continually damp condition for at least 3 days after the application of the repair grout.

3.02 FLOORS AND SLABS

A. Floated Finish

1. Machine Floating

- a. Screed floors and slabs with straightedges to the established grades shown on the Drawings. Immediately after final screeding, a dry cement/sand shake in the proportion of two sacks of Portland cement to 350 lbs. of coarse natural concrete sand shall be sprinkled evenly over the surface at the rate of approximately 500 lbs. /1,000 sq ft of floor. Do not sprinkle neat, dry cement on the surface.
- b. The application of the cement/sand shake may be eliminated at the discretion of the LWC Project Manager and the KYTC Resident Engineer if the base slab concrete exhibits adequate fattiness and homogeneity and the need is not indicated. When the concrete has hardened sufficiently to support the weight of a power float without its digging into or disrupting the level surface, thoroughly float the shake into the surface with a heavy revolving disc type power compacting machine capable of providing a 200 lb. compaction force distributed over a 24-in diameter disc.
- c. Start floating along walls and then move systematically across the surface leaving a matte finish.
- d. The compacting machine shall be the "Kelly Power Float with Compaction Control" as manufactured by Kelley Industries of SSP Construction Equipment Inc., Pomona, CA or equal. Troweling machines equipped with float (shoe) blades that are slipped over the trowel blades may be used for floating. Floating with a troweling machine equipped with normal trowel blades will not be permitted. The use of any floating or troweling machine which has a water attachment for wetting the concrete surface during finishing will not be permitted.

2. Hand Floating

- a. In lieu of power floating, small areas may be compacted by hand floating. The dry cement/sand shake previously specified shall be used unless specifically eliminated by the LWC Project Manager or the KYTC Resident Engineer. Screed the floors and slabs with straightedges to the established grades shown on the Drawings. While the concrete is still green, but sufficiently hardened to support a finisher and kneeboards

with no more than 1/4-in indentation, wood float to a true, even plane with no coarse aggregate visible. Use sufficient pressure on the wood floats to bring moisture to the surface.

3. Finishing Tolerances

- a. Level floors and slabs to a tolerance of plus or minus 1/8-in when checked with a 10-ft straightedge placed anywhere on the slab in any direction. Where drains occur, pitch floors to drains such that there are no low spots left undrained. Failure to meet either of the above requirements shall be cause for removal, grinding, or other correction as directed by the LWC Project Manager.

B. Broom Finish

1. Screed slabs with straightedges to the established grades indicated on the Drawings. When the concrete has stiffened sufficiently to maintain small surface indentations, draw a stiff bristle broom lightly across the surface in the direction of drainage, or, in the case of walks and stairs, perpendicular to the direction of traffic to provide a non-slip surface.

C. Steel Trowel Finish

1. Finish concrete as specified in Paragraph 3.04. Then, hand steel trowel to a perfectly smooth hard even finish free from high or low spots or other defects.

3.03 CONCRETE RECEIVING CHEMICAL HARDENER

- A. After 28 days, minimum, concrete cure, apply chemical hardener in three applications to a minimum total coverage of the undiluted chemical of 100 sq ft per gallon and in accordance with manufacturer's recommendations as reviewed.

3.04 APPROVAL OF FINISHES

- A. All concrete surfaces, when finished, will be inspected by the LWC Project Manager and the KYTC Representative.
- B. Surfaces which, in the opinion of the LWC Project Manager or the KYTC Resident Engineer, are unsatisfactory shall be refinished or reworked.
- C. After finishing horizontal surfaces, regardless of the finishing procedure specified, the concrete shall be cured in compliance with Section 03300 unless otherwise directed by the LWC Project Manager.

3.05 SCHEDULE OF FINISHES

- A. Concrete shall be finished as specified either to remain as natural concrete to receive an additional applied finish or material under another section.
- B. Concrete for the following conditions shall be finished as noted on the Drawings and as further specified herein:
 1. Concrete to Receive Dampproofing: Rough-form finish. See Paragraph 3.01D above.
 2. Concrete Not Exposed to View and Not Scheduled to Receive an Additional Applied Finish or Material: Rough-form finish. See Paragraph 3.01D above.

3. Exterior Vertical Concrete Above Grade Exposed to View: Rubbed finish. See Paragraph 3.01E above.
4. Vertical Concrete in Water Containment Areas. Rubbed finish on exposed surfaces and extending to two feet below normal operating water level: Rough-form finish on remainder of submerged areas. See Paragraphs 3.01E and 3.01D above.
5. Concrete for Exterior Walks, Interior and Exterior Stairs: Broomed finish perpendicular to direction of traffic. See Paragraph 3.02B above.

END OF SECTION

SECTION 03600

GROUT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install grout complete as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Formwork is included in Section 03100.
- B. Concrete Reinforcement is included in Section 03200.
- C. Cast-in-Place Concrete is included in Section 03300.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Commercially manufactured nonshrink cementitious grout. The submittal shall include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to required ASTM standards and Material Safety Data Sheet.
 - 2. Commercially manufactured nonshrink epoxy grout. The submittal shall include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to required ASTM standards and Material Safety Data Sheet.
 - 3. Concrete grout. The submittal shall include data as required for concrete as delineated in Section 03300 and for fiber reinforcement as delineated in Section 03200. This includes the mix design, constituent quantities per cubic yard and the water/cement ratio.
- B. Samples
 - 1. Samples of commercially manufactured grout products when requested by the LWC Project Manager or the KYTC Resident Engineer.
 - 2. Aggregates for use in concrete grout when requested by the LWC Project Manager or the KYTC Resident Engineer.
- C. Laboratory Test Reports
 - 1. Submit laboratory test data as required under Section 03300 for concrete to be used as concrete grout.
- D. Certifications

1. Certify that commercially manufactured grout products and concrete grout admixtures are suitable for use in contact with potable water after 30 days curing.
2. Certify that the Contractor is not associated with the independent testing laboratory, nor does the Contractor or its officers have a beneficial interest in the laboratory.

E. Qualifications

1. Grout manufacturers shall submit documentation that they have at least 10 years experience in the production and use of the proposed grouts which they will supply.
2. Submit the name, address and qualifications of the independent testing laboratory.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C33 – Standard Specification for Concrete Aggregates
2. ASTM C150 – Standard Specification for Portland Cement
3. ASTM C827 – Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
4. ASTM C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

B. U.S. Army Corps of Engineers Standard (CRD)

1. CRD C-621 – Corps of Engineers Specification for Nonshrink Grout

1.05 QUALITY ASSURANCE

A. Qualifications

1. Grout manufacturer shall have a minimum of 10 years experience in the production and use of the type of grout proposed for the work.

B. Pre-installation Conference

1. Well in advance of grouting, hold a pre-installation meeting to review the requirements for surface preparation, mixing, placing and curing procedures for each product proposed for use. Parties concerned with grouting shall be notified of the meeting at least 10 days prior to its scheduled date.

C. Services of Manufacturer's Representative

1. A qualified field technician of the nonshrink grout manufacturer, specifically trained in the installation of the products, shall attend the pre-installation conference and shall be present for the initial installation of each type of nonshrink grout. Additional services shall also be provided, as required, to correct installation problems.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the jobsite in original, unopened packages, clearly labeled with the manufacturer's name, product identification, batch numbers and printed instructions.
- B. Store materials in full compliance with the manufacturer's recommendations. Total storage time from date of manufacture to date of installation shall be limited to 6 months or the manufacturer's recommended storage time, whichever is less.
- C. Material which becomes damp or otherwise unacceptable shall be immediately removed from the site and replaced with acceptable material at no additional expense to the Owner.
- D. Nonshrink cement-based grouts shall be delivered as preblended, prepackaged mixes requiring only the addition of water.
- E. Nonshrink epoxy grouts shall be delivered as premeasured, prepackaged, three component systems requiring only blending as directed by the manufacturer.

1.07 DEFINITIONS

- A. Nonshrink Grout: A commercially manufactured product that does not shrink in either the plastic or hardened state, is dimensionally stable in the hardened state and bonds to a clean base plate.

PART 2 PRODUCTS

2.01 GENERAL

- A. The use of a manufacturer's name and product or catalog number is for the purpose of establishing the standard of quality desired.
- B. Like materials shall be the products of one manufacturer or supplier in order to provide standardization of appearance.

2.02 MATERIALS

- A. Nonshrink Cementitious Grout
 - 1. Nonshrink cementitious grouts shall meet or exceed the requirements of ASTM C1107, Grades B or C and CRD C-621. Grouts shall be Portland cement based, contain a pre-proportioned blend of selected aggregates and shrinkage compensating agents and shall require only the addition of water. Nonshrink cementitious grouts shall not contain expansive cement or metallic particles. The grouts shall exhibit no shrinkage when tested in conformity with ASTM C827.
 - a. General purpose nonshrink cementitious grout shall conform to the standards stated above and shall be SikaGrout 212 by Sika Corp.; Set Grout by Master Builders, Inc.; Gilco Construction Grout by Gifford Hill & Co.; Euco NS by The Euclid Chemical Co.; NBEC Grout by U. S. Grout Corp. or equal.

- b. Flowable (Precision) nonshrink cementitious grout shall conform to the standards stated above and shall be Masterflow 928 by Master Builders, Inc.; Hi-Flow Grout by the Euclid Chemical Co.; SikaGrout 212 by Sika Corp.; Supreme Grout by Gifford Hill & Co.; Five Star Grout by U. S. Grout Corp. or equal.

B. Concrete Grout

1. Concrete grout shall conform to the requirements of Section 03300 except as specified herein. It shall be proportioned with cement, coarse and fine aggregates, water, water reducer and air entraining agent to produce a mix having an average strength of 2900 psi at 28 days, or 2500 psi nominal strength. Coarse aggregate size shall be 3/8-in maximum. Slump should not exceed 5-in and should be as low as practical yet still retain sufficient workability.

C. Water

1. Potable water, free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.

PART 3 EXECUTION

3.01 PREPARATION

- A. Grout shall be placed over cured concrete that has attained its full design strength unless otherwise approved by the LWC Project Manager or the KYTC Resident Engineer.
- B. Concrete surfaces to receive grout shall be clean and sound; free of ice, frost, dirt, grease, oil, curing compounds, laitance and paints and free of all loose material or foreign matter which may affect the bond or performance of the grout.
- C. Roughen concrete surfaces by chipping, sandblasting, or other mechanical means to ensure bond of the grout to the concrete. Remove loose or broken concrete. Irregular voids or projecting coarse aggregate need not be removed if they are sound, free of laitance and firmly embedded into the parent concrete.
 1. Air compressors used to clean surfaces in contact with grout shall be the oilless type or equipped with an oil trap in the airline to prevent oil from being blown onto the surface.
- D. Remove all loose rust, oil or other deleterious substances from metal embedments or bottom of baseplates prior to the installation of the grout.
- E. Concrete surfaces shall be washed clean and then kept moist for at least 24 hours prior to the placement of cementitious or cement grout. Saturation may be achieved by covering the concrete with saturated burlap bags, use of a soaker hose, flooding the surface, or other method acceptable to the LWC Project Manager and the KYTC Resident Engineer. Upon completion of the 24-hour period, visible water shall be removed from the surface prior to grouting. The use of an adhesive bonding agent in lieu of surface saturation shall only be used when approved by the LWC Project Manager and the KYTC Resident Engineer for each specific location of grout installation.
- F. Construct grout forms or other leakproof containment as required. Forms shall be lined or coated with release agents recommended by the grout manufacturer. Forms shall be of adequate

strength, securely anchored in place and shored to resist the forces imposed by the grout and its placement.

- G. Level and align the structural or equipment bearing plates in accordance with the structural requirements and the recommendations of the equipment manufacturer.
- H. Equipment shall be supported during alignment and installation of grout by shims, wedges, blocks or other approved means. The shims, wedges and blocking devices shall be prevented from bonding to the grout by appropriate bond breaking coatings and removed after grouting unless otherwise approved by the LWC Project Manager and the KYTC Resident Engineer.

3.02 INSTALLATION – GENERAL

- A. Mix, apply and cure products in strict compliance with the manufacturer's recommendations and this Section.
- B. Have sufficient manpower and equipment available for rapid and continuous mixing and placing. Keep all necessary tools and materials ready and close at hand.
- C. Maintain temperatures of the foundation plate, supporting concrete, and grout between 40 and 90 degrees F during grouting and for at least 24 hours thereafter or as recommended by the grout manufacturer, whichever is longer. Take precautions to minimize differential heating or cooling of baseplates and grout during the curing period.
- D. Take special precautions for hot weather or cold weather grouting as recommended by the manufacturer when ambient temperatures and/or the temperature of the materials in contact with the grout are outside of the 60 and 90 degrees F range.
- E. Install grout in a manner which will preserve the isolation between the elements on either side of the joint where grout is placed in the vicinity of an expansion or control joint.
- F. Reflect all existing underlying expansion, control and construction joints through the grout.

3.03 INSTALLATION – NONSHRINK CEMENTITIOUS GROUTS

- A. Mix in accordance with manufacturer's recommendations. Do not add cement, sand, pea gravel or admixtures without prior approval by the LWC Project Manager or the KYTC Resident Engineer.
- B. Avoid mixing by hand. Mixing in a mortar mixer (with moving blades) is recommended. Pre-wet the mixer and empty excess water. Add premeasured amount of water for mixing, followed by the grout. Begin with the minimum amount of water recommended by the manufacturer and then add the minimum additional water required to obtain workability. Do not exceed the manufacturer's maximum recommended water content.
- C. Placements greater than 3-in in depth shall include the addition of clean, washed pea gravel to the grout mix when approved by the manufacturer. Comply with the manufacturer's recommendations for the size and amount of aggregate to be added.
- D. Provide forms where and as required. Place grout into the designated areas in a manner which will avoid segregation or entrapment of air. Do not vibrate grout to release air or to consolidate the material. Placement should proceed in a manner which will ensure the filling of all spaces

and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.

- E. Place grout rapidly and continuously to avoid cold joints. Do not place cement grouts in layers. Do not add additional water to the mix (retemper) after initial stiffening.
- F. Just before the grout reaches its final set, cut back the grout to the substrate at a 45 degree angle from the lower edge of bearing plate unless otherwise approved by the LWC Project Manager or the KYTC Resident Engineer. Finish this surface with a wood float or brush finish.
- G. Begin curing immediately after form removal, cutback, and finishing. Keep grout moist and within its recommended placement temperature range for at least 24 hours after placement or longer if recommended by the manufacturer. Saturate the grout surface by use of wet burlap, soaker hoses, ponding or other approved means. Provide sunshades as necessary. If drying winds inhibit the ability of a given curing method to keep grout moist, erect wind breaks until wind is no longer a problem or curing is finished.

3.04 INSTALLATION – CONCRETE GROUT

- A. Screed underlying concrete to the grade shown on the Drawings. Provide the surface with a broomed finish, aligned to drain. Protect and keep the surface clean until placement of concrete grout.
- B. Remove the debris and clean the surface by sweeping and vacuuming of all dirt and other foreign materials. Wash the tank slab using a strong jet of water. Flushing of debris into tank drain lines will not be permitted.
- C. Saturate the concrete surface for at least 24 hours prior to placement of the concrete grout. Saturation may be maintained by ponding, by the use of soaker hoses, or by other methods acceptable to the LWC Project Manager or the KYTC Resident Engineer. Remove excess water just prior to placement of the concrete grout. Place a cement slurry immediately ahead of the concrete grout so that the slurry is moist when the grout is placed. Work the slurry over the surface with a broom until it is coated with approximately 1/16 to 1/8-in thick cement paste.
- D. Place concrete grout to final grade using the scraper mechanism as a guide for surface elevation and to ensure high and low spots are eliminated. Unless specifically approved by the equipment manufacturer, mechanical scraper mechanisms shall not be used as a finishing machine or screed.
- E. Finish shall be steel trowel as specified in Section 03350 and as approved. Cure the concrete grout as specified for cast-in-place concrete.

3.05 SCHEDULE

- A. The following list indicates where the particular types of grout are to be used:
 - 1. General purpose nonshrink cementitious grout: Use at all locations where non-shrink grout is called for on the plans except for base plates greater in area than 3-ft wide by 3-ft long and except for the setting of anchor rods, anchor bolts or reinforcing steel in concrete.
 - 2. Flowable nonshrink cementitious grout: Use under all base plates greater in area than 3-ft by 3-ft. Use at all locations indicated to receive flowable nonshrink grout by the Drawings.

The Contractor, at his/her option and convenience, may also substitute flowable nonshrink grout for general-purpose nonshrink cementitious grout.

END OF SECTION

SECTION 15100

VALVES AND APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all gate valves and appurtenances as shown on the Project Drawings and as specified herein. Supplier shall design, manufacture, shop test, and deliver all valves and accessories, including actuators in strict accordance with American Water Works Association (AWWA) Standard C515-09, AWWA Standard For Resilient Seated Gate Valves
- B. The equipment shall include but is not limited to the following:
 - 1. Gate Valves
 - 2. Air Release/Vacuum Valves

1.02 RELATED WORK

- A. Piping is included in Division 2.

1.03 DESCRIPTION OF SYSTEMS

- A. All of the equipment and materials specified herein is intended to be standard for use in controlling the flow of wastewater, sludges, water, air, or chemicals, depending on the applications.

1.04 QUALIFICATIONS

- A. The gate valves shall be Iron body, Resilient Seat Gate Valve as manufactured by United States Pipe and Foundry Company, of Birmingham, Alabama; or American Flow Control Series 2500, or an approved equal. For proposed equals, the CONTRACTOR shall submit manufacturer's information and specifications to the LWC Project Manager via the KYTC Resident Engineer, no later than 5 working days before the scheduled bid opening, for PRE-APPROVAL as an equal. All valves and appurtenances shall be of the size shown on the Project Drawings and as far as possible all equipment of the same type shall be from one manufacturer. All valves and appurtenances shall have the name of the maker, flow-directional arrows, and the working pressure for which they are designed cast in raised letters on some appropriate part of the body.

1.05 SUBMITTALS

- A. Complete Shop Drawings of all valves and appurtenances shall be submitted to the LWC Project Manager via the KYTC Resident Engineer for approval in accordance with the requirements of Section 01300.

1.06 OPERATING INSTRUCTIONS

- A. Manufacturer's operating and maintenance instructions in ten (10) sets shall be furnished to the LWC Project Manager via the KYTC Resident Engineer for equipment furnished under this Section and shall be in accordance with Section 01300.

- B. The valve manufacturer shall supply and integrally mount all valve operators at the factory. The valve and operators shall be shipped as a unit.
- C. All valves shall open clockwise (to the right).
- D. Valve operator shall be provided with enclosed bevel gearing to reduce the torque required to operate the valve. The maximum required input torque to the actuator shall not exceed 125 foot-pounds, and shall meet AWWA Class 150B maximum operating torque for the respective valve. The actuators shall be full gasket, suitably seal, grease-packed for life, and designed to withstand submersion in water to 10 psi.
- E. The actuator shall be fitted with a 2-inch AWWA valve-operating nut, cast iron.
- F. The number of turns shall not be less 3 times the valve diameter (inches) or more than 4 times the valve diameter to open or close the valve.

1.07 TOOLS

- A. Special tools, if required for normal operation and maintenance shall be supplied with the equipment.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General

1. All valves and appurtenances shall be of the size shown on the Drawings and as far as possible all equipment of the same type shall be from one manufacturer.
2. All valves and appurtenances shall have the name of the manufacturer, flow direction arrows, and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.
3. Except as otherwise shown on the Drawings or specified herein, all valves with operators located 6 feet or more above the operating floor shall be provided with chain wheel operators complete with chain guides and galvanized steel chain.
4. All valves shall open Right (clockwise).

2.02 PRODUCTS

A. Gate Valves

1. General Requirements.
 - a. Unless otherwise specified below, these requirements shall apply to all gate valves.
 - b. Gate valves shall meet the requirements of AWWA C500 and AWWA C515-09 as applicable to the type of valve specified.
 - c. Buried and submerged valves shall be furnished with mechanical joints and stainless steel hardware; non-rising stem design.

- d. Exposed valves shall be furnished with Class 250 flanged ends; provide valves with outside screw and yoke. Exposed valves 16-inch and larger shall be furnished with a valve bypass.
- e. The valve body, bonnet and gate castings shall be constructed of ductile iron, and shall have full shell thickness according to AWWA C515-09, table 2, section 4.4.
- f. Rising stem valves shall be sealed with adjustable and replaceable packing; valve design must permit packing replacement under operating system pressures with only moderate leakage.
- g. Non-rising stem valves shall use a double O-ring stem seal, except that packing shall be used where geared operators are required.
- h. Except as otherwise specified, valves shall be rated for the following working water pressures:

Valve Size Pressure (psig)	
3-inch to 48-inch	250

All valve bodies shall be hydrostatically tested to at least twice the rated working water pressure. In addition, valves shall be seat-tested, bi-directional at the rated working pressure, with a bubble tight seal. Provide certificates of testing.

- i. Flanged valves to have face-to-face dimensions per ANSI C115.
- j. All bonnet and packing gland bolts shall be zinc or cadmium electroplated steel; packing gland bolts shall have bronze nuts.
- k. All valves shall be marked per AWWA Standards, including name of manufacturer, valve size and working pressure and year of manufacture.
- l. Valve operation shall be counterclockwise for potable water, clockwise other non-potable waters. Provide permanent label showing "OPEN" and arrows.
- m. Resilient-seated gate valves shall conform in all respects to ANSI/AWWA C515-09 with non-rising stems, fully bronze mounted with O-ring seals. Valves shall be of standard manufacture and of the highest quality both as to materials and workmanship and shall conform to the latest revisions of AWWA Specification C-500. Valves shall have a rated working pressure of 250 psi, and test pressure of 500 psi and shall be opened by turning clockwise only.
- n. Shall be designed for buried service where groundwater may completely submerge the valve and actuator. Gate valves shall be furnished with mechanical joint end connections with stainless steel hardware T-316, unless otherwise shown on the plans or specified herein. The end connections shall be suitable to receive ductile iron pipe. All gate valves shall be mechanically restrained to pipe utilizing a positive mechanical restraint such as American's Coupling Gland Ends, or equal, employing stainless steel 316 bolts and nuts. No friction type restraint such as Megalugs will be acceptable.
- o. Shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working pressure cast on the body of the valve. The valve body shall be ductile iron

- p. Shall be installed in a horizontal stem position, with actuator located in a manhole vault. (At the time of shop drawing review, the LWC Project Manager will advise which side of the valve the actuator will be located.)
- q. Subjected to a non-shock shutoff pressure of as much as 150 psi in the event of an emergency closure.
- r. Shall be used for potable water service with a temperature range of 34 degrees F to 85 degrees F and a pH range of 8.0 to 8.5

2. Valve Applications

- a. Valves for Potable Water Service.
- b. Gate Valves shall be resilient seated Metroseal manufactured by U.S. Pipe, or equal.

3. Valve Requirements

- a. Resilient Seated
 - Conform to AWWA C515-09.
 - Internal and external epoxy of valve body, including bonnet, per AWWA C550.
 - Gate shall be encapsulated with synthetic rubber. It shall be bonded and vulcanized in accordance with ASTM B429 Method B.
 - No recesses in valve body.
 - Valves shall be installed in the vertical position.

4. Buried Valves

- a. Conform to the requirements above, except mechanical joint bell ends per AWWA C111. All exposed valve hardware (nuts, bolts, washers, etc.) including bonnet, bonnet cover, stuffing box, gear adaptor and joints shall be Type 316 stainless steel.
- b. Non-rising stem design, double O-ring seals for non-g geared valves and shall incorporate packing for geared valves.
- c. Provide valve box, 2-inch operating nut and extension stem and stem cover, and tee handled valve wrenches.

B. Air Release and Vacuum Valves

- 1. Air release and vacuum valves shall be of the size indicated on the Drawings and designed to control the flow of large air volumes both into and out of the pipelines to which they are connected. Valves shall be tight against leakage under a working pressure of 200 psi and shop tested at a pressure of 300 psi.
- 2. The air release vacuum valve shall be comprised of a small orifice assembly and large orifice assembly housed in a single body. The large orifice assembly shall exhaust air from a pipeline during the initial filling of the pipeline. The large orifice assembly shall not blow shut while exhausting air, even while venting air at sonic velocity. When all air has been exhausted from the pipeline, the large orifice float ball shall be buoyed up to seat tightly against a resilient seat ring. The large orifice float ball shall remain tightly closed while the pipeline is under positive pressure. Should the pipeline pressure fall below atmospheric pressure, the large orifice float ball shall fall away from the seat ring and permit air to enter the pipeline.

The small orifice assembly shall automatically release air accumulations from the pipeline while under positive pressure. When the valve body fills with air, the small orifice float ball falls to open the small orifice and exhaust the air to atmosphere. When the air has been exhausted, the small orifice float shall be buoyed up and tightly close the small orifice. There shall be no baffles, deflectors, or stems.

In addition, each valve shall be furnished with a flanged gate valve for isolation purposes.

3. The valve body and covers shall be of ASTM A126, Class B cast iron construction. Large and small orifice float balls shall be 302 stainless steel, ASTM A240. The float arm, leverage arm and link shall be 304 stainless steel. The pivot pin shall be 18-8 stainless steel.
4. The air release vacuum valves shall be installed in the manner and at the locations as shown on the Drawings. Valves shall be Golden Anderson air and vacuum valve Figure 960 or equal, 2-inch.

C. Self-Centering Alignment Ring

1. All buried valve boxes shall have a two-piece AFC Centering Ring that centers the valve box directly over the valve and aligns the box in a vertical position. The centering ring shall have an adjustable detented slide to compensate for multiple stem diameters. The installation of the alignment ring below the operating nut shall not disturb the function of the nut nor shall the operating nut have to be removed to install the centering ring.

PART 3: EXECUTION

3.01 INSTALLATION

- A All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer before they are installed.
- B After installation, all valves and appurtenances shall be tested at the same duration and pressure as the piping system they are in. If any joint proves to be defective, it shall be repaired to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer.
- C Install all brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.
- D All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves and other equipment which do not operate easily, or are otherwise defective, shall be repaired or replaced at not additional cost.
- E Unless otherwise specified or approved by the LWC Project Manager, all newly installed gate valves shall maintain a minimum 12" of cover as measured from the top of ground elevation to the top nut elevation.

- F All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to these items shall be repaired to the satisfaction of the LWC Project Manager before they are installed.
- G After installation, all valves and appurtenances shall be tested at least one (1) hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the LWC Project Manager.
- H All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning; and all nuts and bolts checked for tightness. Valves and other equipment that do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to the OWNER.

3.02 SHOP PAINTING

- A Interior surfaces of all valves except the exterior surfaces of buried valves and miscellaneous piping appurtenances shall be given a shop finish of an asphalt varnish conforming to Federal Specification TT-V51e for Varnish Asphalt.
- B. The exterior surface of various parts of valves, operators, floorstands and miscellaneous piping shall be thoroughly cleaned of all scale, dirt, grease or other foreign matter and thereafter one shop coat of an approved rust-inhibitive primer such as Inertol Primer No. 621 shall be applied in accordance with the instructions of the paint manufacturer. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating.
- C General - The finish coating materials shall be suitable for potable water service, and shall conform to the applicable requirements of the latest revision to AWWA C550, Protective Interior Coatings for Valves and Hydrants. All internal and external surfaces, except finished or bearing surfaces, shall be shop-cleaned and coat-applied in accordance with this Specification and with the applicable Steel Structure Painting Council (SSPC) Specifications. A light color shall be used to enhance inspection and maintenance.
- D Surface Preparation - Surface irregularities, such as weld spatter, burrs, and sharp or rough edges, shall be eliminated prior to surface preparation. Surfaces shall be prepared in accordance with Steel Structures Painting Council Specifications SP-6, Commercial Blast Cleaning, with 1.5-3.0 mils profile depth. If grease or spills are present, solvent cleaning to SSPC SP-1 quality must precede SP-6.
- E Paint System and Application - Coatings shall be applied in accordance with the recommendations found in SSPC PA-1, Shop, Field, and Maintenance Painting. The paint system shall be a two-coated catalyzed epoxy system for ferrous and non-ferrous metals subject to chemical corrosion or physical abrasion. The first coat shall be a high-build catalyzed epoxy with a minimum 50 percent solids applied by volume, applied at 6 - 8 mils (dry). The second coat shall be the same as the first coat. The system's total thickness shall be 12 mils (dry) minimum, and shall be holiday-free when tested in accordance with AWWA C550, using a holiday detector such as Tinker and Raser MI/AC.

3.03 INSPECTION AND TESTING

- A. The various pipelines in which the valves and appurtenances are to be installed are specified to be field-tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable to the LWC Project Manager and the KYTC Resident Engineer.
- B. Valve and Actuator - The test program outlined in AWWA Specification C515-09 shall be followed for Performance, Leakage, and Hydraulic tests, except, that the provision to substitute a hydrostatic test

(Section 5.2.2.2) shall be disallowed, and valves are to be tested in both directions. A copy of a previous proof-of-design test shall be acceptable. The Supplier shall submit an affidavit of compliance with testing and other provisions of AWWA C515-09, as modified herein, with the submittal required by Part 1.03 above. The Supplier shall send a certification of compliance of capabilities of the actuators furnish as a component of each unit.

- C. Coating - The Supplier shall submit an affidavit of compliance, signifying that the coating and application complies with the requirements of AWWA C550 Protective Interior Coatings for Valves and Hydrants and Steel Structure Painting Council's Steel Structures Painting Manual, Volumes 1 and 2. Test data related to the requirements of Section 2 and the toxicological compatibility of the coating materials with potable water application shall be submitted along with the affidavit.

END OF SECTION

LOUISVILLE WATER COMPANY
WIDEN KY 61 SOUTH OF BROOKS RUN ROAD TO
CONESTOGA PARKWAY
ITEM NO. 5-117.20

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GENERAL REQUIREMENTS

- A. All water main materials including but not limited to fittings, gate valves, tie-in assemblies, drain assemblies, air release assemblies, bends, pre cast vaults, steel casing pipe, spacers, end seals, polyethylene encasement and disinfection materials shall be supplied by the contractor. Material submittals shall be made to and approved by the LWC Project Manager and the KTC Project Manager prior to installation.
- B. All change order requests that impact water main construction shall be reviewed and approved by the LWC Project Manager and the KTC Project Manager.
- C. The contractor is bound by and shall comply with the provisions of the "Louisville Water Company Technical Specifications and Standard Drawings for Pipeline Construction" (2008 Edition) which shall govern work on this project for water main 4" – 20", services and hydrants.
- D. All work performed for the installation and relocation of the water main and related construction must be performed by an LWC pre-qualified contractor in the following categories:
- Category 1: 4" – 16" Ductile Iron Water Main for distribution main work.
 - Category 4: 20" – 48" Ductile Iron Water Main for transmission main work.

TRAFFIC CONTROL

- E. This project will be bid and constructed in conjunction with the Kentucky Transportation Cabinet's (KTC) Preston Highway project; therefore, no KTC permits will be required by LWC. Contractor shall obtain all permits through KTC.

WARRANTY

- F. The Contractor warrants to the Company that materials and equipment furnished by the Contractor under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Company, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.
- G. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract

Documents or a release of the Contractor's obligation to perform the work in accordance with the Contract Documents:

1. Observations by the Project Manager;
 2. Payment by KYTC;
 3. Issuance of a certificate of Substantial Completion;
 4. Use or occupancy of any part of the Work by the Company;
 5. Review of Shop Drawings or other Submittals;
 6. Any inspection, test, or approval by others; or
 7. Any correction of defective Work by the Company.
- H. Failure on the part of the Company and KYTC to insist on strict performance by the Contractor of any provision of this Contract is not a waiver of any of the Company's and KYTC's rights and/or remedies, nor shall it relieve the Contractor from performing any subsequent obligations strictly in accordance with the terms of this Contract.
- I. The Company and KYTC may, at its option, waive compliance with any particular Contract requirement. No waiver shall be effective unless in writing and signed by both the Company and the Contractor. Written waivers shall be limited to the specified provisions of this Contract specifically referred to herein, and shall not be deemed a waiver of any other provision. The written waiver shall not constitute a continuing waiver unless it states otherwise.
- J. All work shall be warranted for two (2) years from the date of Final Completion unless specified otherwise. Paved surfaces and restoration of structures will be warranted for five (5) years. Contractor-furnished materials shall be warranted for five (5) years after the pipeline is placed in service. Satisfactory performance of the water main and appurtenances, as they relate to installation, shall be warranted for two (2) years after the iron pipeline is placed in service. The Company reserves the right to require Contractor's presence at scheduled Warranty inspections held within the 12-month period following acceptance of the Project.
- K. Contractor shall assign to the Company all manufacturers' warranties. All such warranties shall be directly enforceable by the Company. Such assignment shall in no way affect the Contractor's responsibilities and duties during the warranty period.

SECTION 01010
SUMMARY OF WORK

PART 1: GENERAL

1.01 LOCATION OF WORK

- A. The work of this Contract is located in the Central Part of Bullitt County, Kentucky along KY 61 (Preston Highway).

1.02 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for the 24-inch transmission main and 6-16-inch distribution main as shown on the drawings and specified herein.
- B. The work shall include but is not necessarily limited to the following:
1. Supply and Installation of approximately 25 +/- linear meters (82 linear feet) of 400 mm (16-inch) diameter ductile iron water main, 1,477 +/- linear meters (4,846 linear feet) of 300 mm (12-inch) diameter ductile iron water main and 73 +/- linear meters (240 linear feet) of 150 mm (6-inch) diameter ductile iron water main including all fittings and appurtenances.
 2. Supply and Installation of vaults for drain valves, gate valves, and air release valves.
 3. Asphalt and concrete pavement repair and replacement.
 4. Traffic control including policing, barricades, signs, warning devices, flaggers, etc.
 5. Installation of sedimentation and erosion control measures per standard including submittal of control plan and obtaining the necessary permits and approval.
 6. Site Restoration and cleanup work.
 7. Perform all site work, utility relocations, and all other work required to complete the project.

END OF SECTION

SECTION 01047

CONTROL OF MATERIALS

PART 1: GENERAL

1.01 APPROVAL OF MATERIALS

- A. Only new materials and equipment shall be incorporated in the Work except where indicated otherwise on the Contract Drawings or directed otherwise by the Project Manager in coordination with KYTC. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the LWC Project Manager and the KYTC representative. No material shall be delivered to the Site without prior approval of the LWC Project Manager and the KYTC representative.
- B. As soon as possible after the Contract has been executed, the Contractor shall submit to the LWC Project Manager through the KYTC resident engineer in conjunction with the KYTC resident engineer, data relating to materials and equipment he proposes to furnish for the Work. Such data shall be in sufficient detail to enable the Project Manager to identify the particular product and to form an opinion as to its conformity to the Specifications.
- C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the LWC Project Manager requires, either prior to beginning or during the progress of the Work, the Contractor shall submit samples of materials for such special tests as may be necessary to demonstrate that they conform to the Specifications. Such samples shall be furnished, stored, packed, and shipped as specified in the General Conditions at the Contractor's expense. Except as otherwise noted, each Contractor will pay for the tests.
- D. The Contractor shall submit data and samples sufficiently early to permit consideration and approval before materials are necessary for incorporation in the Work. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of a claim against the Louisville Water Company or the LWC Project Manager or KYTC and its representative.
- E. When required, the Contractor shall furnish to the Project Manager thru the KYTC resident engineer triplicate sworn copies of manufacturer's shop tests (or reports from independent testing laboratories) relative to materials and equipment performance ratings.
- F. After review of the samples, data and test reports, the materials and equipment used on the Work shall in all respects conform therewith.
- G. If the Work is to be inspected on behalf of the Louisville Water Company during its fabrication, manufacture, or testing, or before shipment, the Contractor shall give notice to the KYTC resident engineer and the Project Manager of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the KYTC resident engineer and sent to the Project Manager in ample time so that the necessary arrangements for the inspection can be made.
- H. In order to demonstrate the proficiency of workmanship or to facilitate the choice among several textures, types, finishes, and surfaces, the Contractor shall provide such samples of workmanship or finish as may be required.

1.02 HANDLING AND STORAGE OF MATERIALS

- A. All materials and equipment to be incorporated in the Work shall be handled and stored by the manufacturer, fabricator, supplier and Contractor before, during, and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft or damage of any kind whatsoever to the material or equipment.
- B. Cement, lime, and grout materials shall be stored under a roof and off the ground and shall be kept completely dry at all times. All miscellaneous reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting.
- C. All mechanical equipment shall be stored in a building to prevent injury. The building may be a temporary structure on the Site or elsewhere, but it must be satisfactory to the Project Manager and to the KYTC resident engineer.
- D. All materials which, in the opinion of the LWC Project Manager, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the Site, and the Contractor shall receive no compensation for the damaged material or its removal.
- E. All pipe and other materials delivered to the job shall be unloaded and placed in a manner which will not hamper the flow of necessary traffic or construction activities.
- F. All machined surfaces and shafting shall be cleaned and protected from corrosion by the proper type and amount of coating necessary to assure protection during shipment and prior to installation.
- G. All equipment requiring special storage or handling such as protection from freezing, moisture and heat shall be clearly marked on the outside of the shipping container.
- H. Storage and demurrage charges by transportation companies and vendors shall be borne by each Contractor.
- I. All deliveries shall be labeled with the Contractor's name and work site.

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. Provide and pay for field engineering services required for project.
 - 1. Survey work required in execution of project.
 - 2. Civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods.
- B. Retain the services of a registered land surveyor licensed in the Commonwealth of Kentucky:
 - 1. Identify existing control points and property line corner stakes indicated on the Drawings, as required.
 - 2. Verify all existing structure locations and all proposed building corner locations, tank locations and equipment locations.
 - 3. Maintain an accurate location of all buried piping 4-in in diameter and larger.

1.02 RELATED WORK

- A. Summary of Work is included in Section 01010.
- B. Project Record Documents are included in Section 01300.

1.03 SUBMITTALS

- A. Submit to the KYTC resident engineer and to the LWC Project Manager the name and address of the registered land surveyor or professional engineer.
- B. On request of the KYTC resident engineer or the LWC Project Manager, submit documentation to verify accuracy of field engineering work.
- C. Submit certificate to the KYTC resident engineer and LWC Project Manager signed by registered engineer or land surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.
 - 1. Certified drawing showing the location, lines and grades in Plan and Profile views of all lines 4-in in diameter and larger buried and exterior to buildings and other buried facilities (e.g. valves, tanks, vaults, etc) installed as a result of the work. This shall be at the same scale as the Engineer's yard piping drawing and submitted on reproducible mylar.
 - 2. Certified survey at the same scale as the Engineer's line drawings (e.g. sewer, force main, water transmission, etc) indicating lines, grades, elevations and stationing at 100-ft increments. Provide elevations of structure bottom, pipe invert(s) and rim elevations on all manholes.

- D. Survey shall include all the requirements as outlined in Paragraph 1.06 below.

1.04 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. Registered professional engineer or land surveyor of the discipline required for the specific service on the project, currently licensed in the Commonwealth of Kentucky.

1.05 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the project are those designated on Drawings.
- B. Locate and protect control points prior to starting site work and preserve all permanent reference points during construction.
 - 1. Make no changes or relocations without prior written notice to the LWC Project Manager and KYTC resident engineer.
 - 2. Report to the LWC Project Manager and KYTC resident engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - 3. Require surveyor to correctly replace project control points which may be lost or destroyed.
 - a. Establish replacements based on original survey control.

1.06 PROJECT SURVEY REQUIREMENTS

- A. Establish one permanent benchmark on site, referenced to data established by survey control points.
 - 1. Record locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Location shall be coordinated with the LWC Project Manager and KYTC resident engineer.
- B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
 - 1. Site improvements
 - a. Stakes for grading, fill and topsoil placement.
 - b. Utility slopes and invert elevations.
 - 2. Batter boards for structures.
 - 3. Building foundation, column locations and floor levels.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- C. From time to time, verify layouts by same methods.

- D. Establish all lines and grades prior to construction of line work for all force mains, raw water mains and transmission mains at 100-ft increments and at defined breaks in grade.

1.07 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses.
- B. Update the project record drawings on a monthly basis based on the work performed during the month ending at the pay request as a condition for approval of monthly progress payment requests.
- C. Maintain an accurate record of piping changes, revisions, and modifications.

PART 2: PRODUCTS (NOT USED)

PART 3: EXECUTION (NOT USED)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1: GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

- A. This Section specifies the general methods and requirements of submissions applicable to Shop Drawings, Product Data, Samples, Construction Photographs, and Construction or Submittal Schedules. Detailed submittal requirements are specified in the technical Sections.
- B. All submittals shall be clearly identified by reference to Section Number, Paragraph, Drawing Number or Detail as applicable. Submittals shall be clear and legible and of sufficient size for presentation of data.

1.02 SHOP DRAWINGS, PRODUCT DATA, SAMPLES

- A. Shop Drawings
 - 1. Shop drawings as specified in individual Sections include, custom-prepared data such as fabrication and erection/installation (working) drawings, scheduled information, setting diagrams, actual shopwork manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the work.
 - 2. All shop drawings submitted by subcontractors shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
 - 3. Check all subcontractor's shop drawings regarding measurements, size of members, materials and details to make sure that they conform to the intent of the Drawings and related Sections. Return shop drawings found to be inaccurate or otherwise in error to the subcontractors for correction before submission thereof.
 - 4. All details on shop drawings shall show clearly the relation of the various parts to the main members and lines of the structure and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the drawings before being submitted.
 - 5. Submittals for equipment specified under this Contract shall include a listing of all installations where identical or similar equipment has been installed and been in operation for a period of at least one year.

B. Product Data

1. Product data as specified in individual Sections include, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the work.

C. Samples

1. Samples specified in individual Sections include, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Louisville Water Company for independent inspection and testing, as applicable to the work.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
 1. Field measurements
 2. Field construction criteria
 3. Catalog numbers and similar data
 4. Conformance with related Sections
- B. Each shop drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements." Shop drawings and product data sheets 11-inches x 17-inches and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Resident Project Representative a copy of each transmittal sheet for shop drawings, product data and samples at the time of submittal to the LWC Project Manager. Shop Drawings that are not stamped will not be reviewed.

- C. The Contractor shall utilize a 10-character submittal identification numbering system in the following manner:
1. The first character shall be a D, S, P, M, or R, which represents Shop/Working Drawing and other Product Data (D), Sample (S), Preliminary Submittal (P), Operating/Maintenance Manual (M), or Request for Information (R).
 2. The next five digits shall be the applicable Section Number.
 3. The next three digits shall be the numbers 001 to 999 to sequentially number each initial separate item or drawing submitted under each specific Section Number.
 4. The last character shall be a letter, A to Z, indicating the submission, or resubmission of the same Drawing, i.e., "A=1st submission, B=2nd submission, C=3d submission, etc. A typical submittal number would be as follows:

D-03300-008-B

D. = Shop Drawing
03300 = Section for Concrete
008 = The eighth initial submittal under this section
B. = The second submission (first resubmission) of that particular shop drawing

- D. Notify the LWC Project Manager and the KYTC Resident Engineer in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.
- E. The review and approval of shop drawings, samples or product data by the LWC Project Manager shall not relieve the Contractor from the responsibility for the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the LWC Project Manager will have no responsibility therefor.
- F. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Louisville Water Company will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- G. Project work, materials, fabrication, and installation shall conform with approved shop drawings, applicable samples, and product data.
- H. The Contractor shall use green ink for all submittals.

1.04 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the Work or in the work of any other contractor.
- B. Each submittal, appropriately coded, will be returned within 28 calendar days following receipt of submittal by the LWC Project Manager.

- C. Number of submittals required:
 - 1. Shop Drawings: Six copies.
 - 2. Product Data: Three copies.
 - 3. Samples: Submit the number stated in the respective Sections.

- D. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The Project title and number.
 - 3. Contractor identification.
 - 4. The names of:
 - a. Contractor
 - b. Supplier
 - c. Manufacturer
 - 5. Identification of the product, with the section number, page and paragraph(s).
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Applicable standards, such as ASTM or Federal Standards numbers.
 - 9. Identification of deviations from Contract Documents.
 - 10. Identification of revisions on resubmittals.
 - 11. A blank space suitably sized for Contractor and Project Manager stamps.
 - 12. Where calculations are required to be submitted by the Contractor, the calculations shall have been checked by a qualified individual other than the preparer. The submitted calculations shall clearly show the names of the preparer and of the checker.

1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

- A. The review of shop drawings, data and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:
 - 1. as permitting any departure from the Contract requirements;
 - 2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
 - 3. as approving departures from details furnished by the LWC Project Manager, except as otherwise provided herein.

- B. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.
- C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which LWC Project Manager finds to be in the interest of the Louisville Water Company and to be so minor as not to involve a change in Contract Price or Contract Time, the LWC Project Manager may return the reviewed drawings without noting an exception.
- D. Submittals will be returned to the Contractor under one of the following codes.

Code 1 - "APPROVED" is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.

Code 2 - "APPROVED AS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.

Code 3 - "APPROVED AS NOTED/CONFIRM". This combination of codes is assigned when a confirmation of the notations and comments IS required by the Contractor. The Contractor may, at his own risk, release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. This confirmation shall specifically address each omission and nonconforming item that was noted. Confirmation is to be received by the Project Manager within 15 calendar days of the date of the Project Manager's transmittal requiring the confirmation.

Code 4 - "APPROVED AS NOTED/RESUBMIT". This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package. This resubmittal is to address all comments, omissions and non-conforming items that were noted. Resubmittal is to be received by the Project Manager within 15 calendar days of the date of the Project Manager's transmittal requiring the resubmittal.

Code 5 - "NOT APPROVED" is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.

Code 6 - "COMMENTS ATTACHED" is assigned where there are comments attached to the returned submittal which provide additional data to aid the Contractor.

Code 7 - "RECEIPT ACKNOWLEDGED" – This code is assigned to acknowledge receipt of a submittal that is not subject to the Project Manager's review and approval; and, is being filed for informational purposes only. This code is generally used in acknowledging receipt of *means and methods of construction* work plan, field conformance test reports, and Health and Safety plans.

Codes 1 through 5 designate the status of the reviewed submittal with Code 6 showing there has been an attachment of additional data.

- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall identify all revisions made to the submittals, either in writing on the letter of transmittal or on the shop drawings by use of revision triangles or other similar methods. The resubmittal shall clearly respond to each comment made by the LWC Project Manager on the previous submission. Additionally, the Contractor shall direct specific attention to any revisions made other than the corrections requested by the LWC Project Manager on previous submissions.
- F. Partial submittals may not be reviewed. The LWC Project Manager will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor and will be considered "Not Approved" until resubmitted. The LWC Project Manager may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.
- G. Repetitive Review
 - 1. Shop drawings and other submittals will be reviewed no more than twice at the Louisville Water Company's expense. All subsequent reviews will be performed at times convenient to the LWC Project Manager and at the Contractor's expense, based on the LWC Project Manager's then prevailing rates. The Contractor shall reimburse the Louisville Water Company for all such fees. Submittals are required until approved.
 - 2. Any need for more than one resubmission, or any other delay in obtaining LWC Project Manager's review of submittals, will not entitle Contractor to extension of the Contract Time.
- H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the LWC Project Manager at least thirty (30) calendar days prior to release for manufacture.
- I. When the shop drawings have been completed to the satisfaction of the LWC Project Manager, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the LWC Project Manager via the KYTC Resident Engineer.

1.06 DISTRIBUTION

- A. Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the LWC Project Manager. Number of copies shall be as directed by the LWC Project Manager but shall not exceed six to the LWC Project Manager and two to the KYTC Resident Engineer.

1.07 CONSTRUCTION PHOTOGRAPHS / PRE-CONSTRUCTION VIDEO

- A. The Contractor shall have an average of 24 color photographs per month made of the work during its progress and 24 color photographs of the completed facilities. The photographs shall be of such views and taken at such times as the LWC Project Manager directs.
- B. All photographic work shall be accomplished through the use of a digital camera. Provide original CD's to the Louisville Water Company and to the KYTC Resident Engineer.
- C. Prior to the initiation of any construction activities, the Contractor, as directed by the Project Manager, shall video the entire length of the pipeline route as directed by the Project Manager to document existing conditions. The original of the DVD shall be released to the Louisville

Water Company. The Contractor shall also provide two (2) copies of the DVD to the Project Manager and two (2) copies to the KYTC Resident Engineer.

1.08 GENERAL PROCEDURES FOR SUBMITTALS

- A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work of other related Sections, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

1.09 RECORD DRAWINGS

- A. The Record Drawings shall consist of annotated (in ink) Contract Drawings and the approved Shop Drawings and shall be submitted to the LWC Project Manager and the KYTC Resident Engineer at any time upon request during construction. The Record Drawings shall also be prepared in reproducible form (3 mil Mylar) and shall be submitted to the LWC Project Manager and the KYTC Resident Engineer upon completion of the construction. The Contractor will be furnished AutoCAD CD's of the Contract Drawings in Version 2010 for preparation of the Record Drawings.
- B. Contract Drawings shall be legibly marked to record actual construction including:
 - 1. All deviations in location or elevation of any underground installation from that shown on the Contract Drawings.
 - 2. Any significant changes in above ground installations from approved Shop Drawings or Contract Drawings.
 - 3. No such deviations from the Contract Drawings or approved Shop Drawings shall be made without approval by the LWC Project Manager and the KYTC Resident Engineer.
 - 4. Actual location and depth of all installed below grade conduit and piping not specifically showed on the Contract Drawings.
- C. Specifications and addenda shall be legibly marked up to record:
 - 1. Manufacturer, trade name, catalog number, and Supplier of each product and item of equipment actually installed.
 - 2. Changes made by Change Order or Field Order.
 - 3. Other matters not originally specified.
- D. Shop Drawings shall be legibly annotated to record changes made after review.
- E. In addition to the 3 mil mylar Record Drawings, and annotated Contract Drawings and Shop Drawings, the Contractor shall also furnish AutoCAD CD's of the Record Drawings in Version 2010.

1.10 SCHEDULES (CONSTRUCTION SCHEDULE, SCHEDULE OF SUBMITTALS, AND SCHEDULE OF VALUES)

- A. Within 14 calendar days after the effective date of the Contract is issued, the Contractor shall submit to the Project Manager via the KYTC Resident Engineer for review:
 - 1. A preliminary progress schedule (Construction Schedule) indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any milestones specified in the Contract Documents. Refer to Specification Section 01311.
 - 2. The Contractor shall submit preliminary schedule of Shop Drawing and Sample Submittals (Schedule of Submittals) which will list each required submittal and the times for submitting, reviewing and processing such submittals. The Schedule of Submittals shall be listed in order of specification section and by the 10-digit submittal identification number.
 - 3. The Contractor shall submit preliminary Schedule of Values for all of the Work which will include quantities.

1.11 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

- A. If specifically required in other Sections of these Specifications, the Contractor shall submit a P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

END OF SECTION

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State of _____ and that he/she has been employed by (Name of Contractor) _____ to design _____ in accordance with Specification Section _____ for the _____. The undersigned further certifies that he/she has performed the design of the _____, that said design is in conformance with all applicable local, state and federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the Louisville Water Company's representative within seven days following written request therefore by the Louisville Water Company.

Area below designated for P.E. stamp:

P.E. Name

Signature

Address

Contractor's Name

Signature

Title

Address

SECTION 01445

PIPELINE TESTING AND CLEANING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and test and clean all new pipelines installed under this Contract as specified herein, including chlorination of all potable waterlines.

1.02 RELATED WORK

- A. Buried pipelines are included in Division 2.

PART 3 EXECUTION

3.01 GENERAL

- A. Furnish all necessary equipment and labor for cleaning, testing and chlorinating the pipelines. The procedures and methods shall be approved by the LWC Project Manager.
- B. Make any taps and furnish all necessary caps, plugs, valves, fittings, etc., as required in conjunction with testing pipelines. Furnish a test pump, gauges and any other equipment required in conjunction with carrying out the hydrostatic tests.

3.02 CLEANING PIPELINES

- A. As pipe laying progresses and at the conclusion of the work thoroughly clean all new pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood or other material which may have entered during the construction period. If, after this cleaning, obstructions remain, they shall be removed.

3.03 TESTING

- A. General
 - 1. Conduct pressure and leakage tests on all newly installed pipelines. Furnish all necessary equipment and material and make all taps in the pipe, as required. The LWC Project Manager and the KYTC representative will monitor the tests.
 - 2. Unless otherwise noted, test pressures shall be as specified below:
 - Hydrostatic Test Pressure (1 Hour)
4-24 Inch Line – 200 psi
 - Leakage Test Pressure (2 Hours)
4-24 Inch Line – 200 psi
 - 3. New pipelines which are to be connected to existing pipelines shall be tested by isolating the new pipe with grooved end pipe caps, spectacle blinds, or blind flanges.

4. Conduct final acceptance tests on buried piping that is to be hydrostatically tested after the trench has been completely backfilled. The Contractor may, if field conditions permit, as determined by the LWC Project Manager and the KYTC Resident Engineer, partially backfill the trench and leave the joints open for inspection and conduct an initial service leak test. The acceptance test shall not, however, be conducted until all backfilling has been completed.

B. Hydrostatic Leak Tests

1. Furnish the following equipment for the hydrostatic tests:

<u>Amount</u>	<u>Description</u>
2	Approved graduated containers.
2	Pressure gauges.
1	Hydraulic force pump approved by the LWC Project Manager. Suitable hose and suction pipe as required.

2. Water shall be used as the hydrostatic test fluid unless otherwise specified. Test water shall be clean and shall be of such quality as to minimize corrosion of the materials in the piping system. Test water shall be acquired from a source as designated by the LWC Project Manager.
3. Vents at all high points of the piping system shall be opened to purge air pockets while the piping system is filling. Venting during the filling of the system also may be provided by the loosening of flanges having a minimum of four bolts or by the use of equipment vents.
4. All parts of the piping system shall be subjected to test pressure specified hereinbefore.
5. Piping
 - a. Where any section of pipe is provided with concrete thrust blocking, do not make the pressure test until at least 4 days have elapsed after the thrust blocking is installed. If high-early cement is used for thrust blocking, the time may be reduced to 2 days.
 - b. When testing cement-mortar lined piping, slowly fill the section of pipe to be tested with water and allow to stand for 24 hours under slight pressure to allow the cement-mortar lining to absorb water.
 - c. Expel all air from the piping system prior to testing and apply and maintain the specified test pressure by means of the hydraulic force pump. Valve off the piping system when the test pressure is reached and conduct the pressure test for 2 hours, reopening the isolation valve only as necessary to restore the test pressure. The pump suction shall be in a barrel or similar device, or metered so that the amount of water required to maintain the test pressure may be measured accurately. This measurement represents the leakage, which is defined as the quantity of water necessary to maintain the specified test pressure for the duration of the test period.
6. No pipe installation will be accepted if the leakage is greater than the number of gallons per hour as determined by the following formula:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

In this formula:

- L = Allowable leakage, in gallons per hour.
- S = Length of pipe tested in feet.
- D = Nominal diameter of pipe, in inches.
- P = Average test pressure during the leakage test, in pounds per square inch.

7. The Contractor shall correct any leakage greater than the allowance determined under this formula at no additional cost to the KYTC or LWC.

C. Initial Service Leak Tests

1. Equipment used for initial service leak testing may be the same as that specified under HYDROSTATIC LEAK TESTS hereinbefore, or the pump connected to the piping system.
2. The initial system leak test shall be performed by gradually bringing the piping system up to normal operating pressure and holding it there continuously for a minimum time of 10 minutes. Examination for leakage shall be made at all joints and connections. The piping system, exclusive of possible localized instances at pump or valve packing, shall show no visual evidence of weeping or leaking. Any visible leakage shall be corrected at no additional cost.

D. Test Records

1. Records shall be made of each piping system installation during the test. These records shall include:
 - a. Date of test.
 - b. Description and identification of piping tested.
 - c. Test fluid.
 - d. Test pressure.
 - e. Remarks, to include such items as:
 - (1) Leaks (type, location).
 - (2) Repairs made on leaks.
 - f. Certification by Contractor and initialed acknowledgment by the LWC Project Manager, copies of which are to be provided to the KYTC Resident Engineer.

3.04 INTERIM CLEANING

- A. Care shall be exercised during fabrication to prevent the accumulation of weld rod, weld spatter, pipe cuttings and fillings, gravel, cleaning rags, etc. within piping sections. All piping shall be examined to assure removal of these and other foreign objects prior to assembly. Shop cleaning may employ any conventional commercial cleaning method if it does not corrode, deform, swell, or otherwise alter the physical properties of the material being cleaned.

3.05 CHLORINATION OF PIPELINES

- A. Piping shall be cleaned and disinfected in compliance with all applicable sections of AWWA Standard C-651. All interior surfaces of pipelines shall be exposed to a minimum 50 PPM chlorine solution for a minimum of 24 hours, after which the lines can be cleaned and flushed provided a 25 PPM residual is maintained after the 24 hour period. The lines shall be flushed clean until the chlorine concentration in the water leaving the lines 1-2 PPM. Chlorine solution with a higher residual may remain in the line, without flushing, if approved by the LWC Project Manager.
- B. During installation, the interior of all pipe, fittings and other accessories shall be kept as free as possible from dirt and foreign matter at all times. If, in the opinion of the LWC Project Manager, the pipe contains dirt or foreign matter that could not be removed during the flushing operation, the interior of the pipe will be cleaned and swabbed with a bactericidal solution. When pipe laying is not in progress, the open ends of pipe shall be sealed with watertight plugs.
- C. After the completion of hydrostatic pressure tests and prior to disinfection, the pipeline shall be flushed, as thoroughly as possible with the water pressure and outlets available. If feasible, flushing rate should develop a velocity in the pipeline of at least 2.5 fps. Since it is usually difficult to secure this minimum velocity in pipelines over 16 in. in diameter, the requirements of Paragraph 3.02 A.1 above shall be rigidly enforced for the larger sizes of pipe. The minimum quantity of water used for flushing shall be in excess of the storage capacity of the pipeline, to insure that clean water has traversed the entire length of the line.
- D. After flushing has been completed to the point that all apparent dirt and foreign matter have been removed from the pipeline, either liquid chlorine or calcium hypochlorite solution shall be injected into the pipeline as provided in AWWA Standard C-601.
- E. Following chlorination, all treated water shall be flushed from the newly laid pipeline at its extremities until the replacement water throughout its length is proved by test to be: a) comparable in quality to the water served the public from the existing water supply system, or b) as approved by the LWC Project Manager. The satisfactory quality of water delivered by the new pipeline shall continue for a period of at least two days. Samples will be taken from a tap located and installed in such a way as to prevent outside contamination. Unless otherwise directed, the sample tap shall either be a hose bib, a disconnected service tap or a ¾ copper riser (with stop-cock), which shall be provided by the Contractor. Should the initial treatment fail to achieve the satisfactory quality described above, the original chlorination procedure shall be repeated until satisfactory results are obtained. All testing shall be performed by the Contractor.
- F. Special disinfecting procedures shall be used in connections to existing pipelines and where the method outlined above is not practical.

3.06 LABORATORY TESTING

- A. The Contractor shall be responsible for all coordination and payment of testing required under this specification section. Within thirty (30) calendar days after Notice-to-Proceed, the Contractor shall furnish the name of the Laboratory proposed to perform the testing as required by this specification section. The testing Laboratory shall be approved/certified by the Commonwealth of Kentucky for this type of testing and is subject to the approval of the LWC Project Manager.

3.07 DISPOSAL OF CHLORINATED WATER

- A. The Contractor will not be permitted to discharge chlorinated or dechlorinated water to the sanitary sewer system. The Contractor shall be responsible for treatment and disposal of chlorinated water in accordance with all Local, State, and Federal Regulations. The Contractor shall be responsible for obtaining all discharge permits from the Kentucky Division of Water, Corps of Engineers, and any other regulatory entity as required for legal disposal of water generated from the disinfection process.

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.

1.02 RELATED WORK

- A. Refer to Conditions of Contract for the general requirements relating to warranties and bonds.
- B. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections.
- C. Certifications and other commitments and agreements for continuing services to Louisville Water Company are specified elsewhere in the Contract Documents.

1.03 SUBMITTALS

- A. Submit written warranties to the Louisville Water Company for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Louisville Water Company.
- B. When a designated portion of the Work is completed and occupied or used by the Louisville Water Company, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Louisville Water Company within fifteen days of completion of that designated portion of the Work.
- C. When a special warranty is required to be executed by the respective Contractor, or the respective Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Louisville Water Company for approval prior to final execution.
- D. Refer to individual Specification Sections for specific content requirements, and particular requirements for submittal of special warranties.
- E. At Final Completion compile two copies of each required warranty and bond properly executed by the respective Contractor, or by the respective Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the Table of Contents of the Project Manual.

- F. Bind warranties and bonds in heavy-bond, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½-in by 11-in paper.
- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification Section in which specified, and the name of the product or work item.
- H. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer, supplier and manufacturer.
- I. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name, address and telephone number of the responsible principal.
- J. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.04 WARRANTY REQUIREMENT

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The respective Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Louisville Water Company has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Louisville Water Company's Recourse: Written warranties made to the Louisville Water Company are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Louisville Water Company can enforce such other duties, obligations, rights, or remedies.
- E. Rejection of Warranties: The Louisville Water Company reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. The Louisville Water Company reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the

Work, until evidence is presented that entities to countersign such commitments are willing to do so.

- G. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the respective Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the respective Contractor.

1.05 DEFINITIONS

- A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Louisville Water Company.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Louisville Water Company.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform all excavation, backfill, fill and grading required completing the work as shown on the Drawings and as specified herein. The work shall include, but not necessarily be limited to; excavation for structures, footings, manholes, vaults, electrical manholes, handholes, conduits, cables, raceways and ducts, pipes and paving; all backfilling and fill; embankment and grading; disposal of waste and surplus materials; and all related work such as sheeting, bracing and pumping.
- B. All excavation, trenching and related sheeting, bracing, etc., shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P). Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- C. Loam, if any, excavated under this Section may be salvaged by the Contractor for his/her own convenience for use as specified under Section 02933.
- D. Provide the services of licensed professional Engineer, registered in the Commonwealth of Kentucky, to prepare temporary excavation support system designs and submittals.

1.02 RELATED WORK

- A. Trenching, Backfilling and Compaction in Section 02221.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager and the KYTC Resident Engineer, in accordance with Section 01300, the following and as elsewhere specified in this Section:
 - 1. Submit certificates of compliance for all materials.
 - 2. Submit to the LWC Project Manager and the KYTC Resident Engineer, in accordance with Section 01300, the proposed methods of construction, including excavation, excavation support systems designs, backfilling and filling and compaction for the various portions of the work. Excavation support system designs shall be prepared by a licensed professional engineer, registered in the Commonwealth of Kentucky, having a minimum of 5 years of professional experience in the design and construction of excavation support systems. Design calculations and drawings will be submitted for record purposes only. Contractor shall remain responsible for adequacy and safety of construction means, methods, and techniques.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C33 – Specification for Concrete Aggregates.

2. ASTM D698 – Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/f (600kN-m/m)
3. ASTM D2487 – Standard Classification of Soils for Engineering Purposes.
4. ASTM D2922 – Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (shallow depth).
5. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
6. ASTM D3017 – Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (shallow depth).
7. ASTM D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 PROTECTION

A. Sheeting and Bracing

1. Furnish, put in place and maintain such sheeting and bracing as may be required: by Federal, State and local safety requirements; to support the sides of excavations; to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction; and to protect adjacent structures from undermining or other damage. If the LWC Project Manager or the KYTC Resident Engineer is of the opinion that at any points sufficient or proper supports have not been provided, he/she may order additional supports put in, and compliance with such order shall not relieve or release the Contractor from his/her responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed. Where soil cannot be properly compacted to fill a void, lean concrete shall be used as backfill.
2. Construct the sheeting outside the neat lines of the foundation, unless indicated otherwise, to the extent deemed desirable for the method of operation. Sheeting shall be plumb and securely braced and tied in position. Sheeting and bracing shall be adequate to withstand all pressures to which the structure or trench will be subjected. Any movement or bulging which may occur shall be corrected to provide the necessary clearances and dimensions.
3. Where sheeting and bracing is required to support the sides of excavations for structures, engage a professional engineer, registered in the Commonwealth of Kentucky, to design the sheeting and bracing. The sheeting and bracing installed shall be in conformity with the design and certification of this shall be provided by the professional engineer. Submit P.E. Certification Form contained in Section 01300 to show compliance with this requirement.
4. Leave in place to be embedded in the backfill all sheeting and bracing not shown on the Drawings but which the LWC Project Manager or the KYTC Resident Engineer may direct in writing to leave in place at any time during the progress of the work for the purpose of preventing injury to structures, utilities, or property, whether public or private. The LWC Project Manager or the KYTC Resident Engineer may direct that timber used for sheeting and bracing be cut off at any specified elevation. Sheeting directed by the LWC Project

Manager or the KYTC Resident Engineer to be left in place will be paid for in accordance with Article 11 of the General Conditions. Payment for sheeting shown on the Drawings to be left in place will be included in the Base Bid. All timber sheeting to be left in place within the limits of the structure shall be treated.

5. All sheeting and bracing not left in place shall be carefully removed in such manner as not to endanger the construction or other structures, utilities, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, or otherwise as may be directed.
6. The right of the LWC Project Manager or the KYTC Resident Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his/her part to issue such orders and his/her failure to exercise his/her right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.
7. No sheeting is to be withdrawn if driven below mid-diameter of any pipe and under no circumstances shall any sheeting be cut off at a level lower than 1 foot above the top of any pipe.

B. Pumping and Drainage

1. At all times during construction provide and maintain proper equipment and facilities to remove all water entering excavations and keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fills, structures or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural levels. Submit to the LWC Project Manager via the KYTC Resident Engineer for review the design of the dewatering systems prior to commencing work.
2. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation. Well or sump installations shall be constructed with proper sand filters to prevent drawing of finer grained soil from the surrounding ground.
3. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps and pumped from the excavation to maintain a bottom free from standing water.
4. Take all additional precautions to prevent uplift of any structure during construction.
5. Drainage shall be disposed of in an approved area only so that flow or seepage back into the excavated area will be prevented, as will saturation of soils on hillsides or slopes.
6. Flotation shall be prevented by maintaining a positive and continuous operation of the dewatering system. Be fully responsible and liable for all damages which may result from failure of this system.
7. Remove the dewatering equipment after the system is no longer required.
8. Take all necessary precautions to preclude the accidental discharge of fuel, oil, etc., in order to prevent adverse effects on groundwater quality.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Common Fill shall consist of mineral soil substantially free from organic materials, loam, wood, trash and other objectionable materials which may be compressible or which cannot be properly compacted. Common fill shall not contain limestone fragments larger than 6 inches in thickness and 12 inches in diameter. Common fill shall not contain granite blocks, broken concrete, masonry rubble or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling. Snow, ice and frozen soil will not be permitted.
- B. Select Common Fill shall be as specified above for Common Fill except that the material shall contain no stones larger than 2 inches in largest dimension.
- C. Riprap used for slope protection shall be sound, durable rock which is roughly rectangular shape and of suitable quality to ensure permanence in the condition in which it is to be used. Rounded stones, boulders, sandstone or similar soft stone will not be acceptable. Material shall be free from overburden, spoil, shale and organic material, meet the LWC Project Manager's and the KYTC Resident Engineer approval and be well graded within the following limits:

<u>Weight of Stone</u>	<u>Percent Finer by Weight</u>
100 lb	100
60 lb	90
25 lb	50
2 lb	10

- D. Crushed Stone
 - 1. When referred to in these Specifications crushed stone shall be Kentucky Department of Transportation SPR Number 57.
 - 2. When referred to in these Specifications dense graded aggregate (DGA) shall be crushed stone classified by the Kentucky Department of Transportation and conforming to the following requirements:

<u>Sieve Size</u>	<u>% Passing</u>
1-in	100
3/4-in	70 to 100
3/8-in	50 to 80
No. 4	35 to 65
No. 10	20 to 50
No. 40	10 to 30
No. 200	5 to 12

- F. Screened Gravel
 - 1. Screened gravel shall consist of hard, durable, rounded or subangular particles of proper size and gradation and shall be free from sand, loam, clay, excess fines and deleterious materials. The gravel shall be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
5/8-in	100
1/2-in	40 to 100
3/8-in	15 to 45
No. 10	0 to 5

G. Sand

1. Sand shall conform to ASTM C33 for fine aggregate.

H. Erosion Control Blanket

1. Erosion control blanket shall be used as indicated on the Drawings and shall conform to the following requirements:
 - a. Minimum grab strength of 120 lbs per ASTM D1682.
 - b. Apparent opening size to be equal to or greater than the U.S. Standard Sieve No. 100 (0.210 mm) per ASTM D4751.
 - c. Percent open area not to exceed about 25%. The percent open area is defined as the ratio of the sum of 20 or more individual open areas (times 100) to the sum of the corresponding 20 or more individual total areas.
 - d. Coefficient of permeability shall not be less than 0.2 cm/sec.
 - e. Erosion control blanket shall be Mirafi, Type 140N; Dupont, Type PAR, Style 3401 or equal product by Amoco.

PART 3 EXECUTIONS

3.01 EXCAVATION BELOW GRADE

- A. If the bottom of any excavation is taken out below the limits shown on the Drawings, specified, or directed by the LWC Project Manager or the KYTC Resident Engineer, it shall be refilled at the Contractor's expense with concrete, 8 inch layers of compacted structural fill or other material satisfactory to the LWC Project Manager and the KYTC Resident Engineer. The type of material to be used shall be at the LWC Project Manager's and the KYTC Resident Engineer's option.
- B. If care is not taken for controlling water properly, through failure to postpone final excavation immediately above the subgrade until shortly before placing of the new work thereon, or other failure or neglect to conduct the excavation work properly so that the surface of the subgrade is in proper condition for construction, remove the unsuitable material and replace it with concrete, compacted structural fill, or other approved material at Contractor's own expense so that the condition of the subgrade meets with the approval of the LWC Project Manager and the KYTC Resident Engineer before any work is placed thereon.
- C. If, in the opinion of the LWC Project Manager and the KYTC Resident Engineer, the material, in its undisturbed natural condition, at or below the normal grade of the excavation as indicated on the Drawings is unsuitable for foundations, it shall be removed to such depth and width as he/she may direct and be replaced with suitable material as directed by the LWC Project

Manager and the KYTC Resident Engineer for which compensation will be made per the General and Supplementary Conditions.

3.02 STRUCTURE EXCAVATION

- A. Excavation shall be made to the grades shown on the Drawings and to such widths as will give suitable room for construction of the structures, for bracing and supporting, pumping and draining. The bottom of the excavations shall be rendered firm and dry and in all respects acceptable to the LWC Project Manager and the KYTC Resident Engineer.
- B. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. Exposed subgrades shall be proof rolled with at least two coverage of the specified equipment. The LWC Project Manager and the KYTC Resident Engineer may waive this requirement if, in his/her opinion, the subgrade will be rendered unsuitable by such compaction. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering, proof rolling, or other construction methods shall be removed and replaced by structural fill as required by the LWC Project Manager and the KYTC Resident Engineer at the Contractor's expense.
- C. Dewatering shall be such as to prevent boiling or detrimental under seepage at the base of the excavation as specified herein.
- D. Excavation equipment shall be satisfactory for carrying out the work in accordance with the requirements specified. In no case shall the earth be ploughed, scraped, or dug with machinery so near to the finished subgrade as to result in excavation of, or disturbance of material below grade, the last of the excavated material being removed with pick and shovel just before placing of concrete or working mat thereon.
- E. When excavation for foundations has reached prescribed depths, the LWC Project Manager and the KYTC Resident Engineer shall be notified and will inspect conditions. If materials and conditions are not satisfactory to the LWC Project Manager or the KYTC Resident Engineer, the LWC Project Manager or the KYTC Resident Engineer will issue instructions as to the procedures and if additional costs are involved, a change order will be processed in accordance with KYTC standard specifications.
- F. During final excavation to subgrade level, take whatever precautions are required to prevent disturbance and remolding. Material which has become softened and mixed with water shall be removed. Hand excavation of the final 3 to 6 inches will be required as necessary to obtain a satisfactory undisturbed bottom. The LWC Project Manager and the KYTC Resident Engineer will be the judges as to whether the work has been accomplished satisfactorily.

3.03 MISCELLANEOUS EXCAVATION

- A. Perform all the remaining miscellaneous excavation. Make all excavations necessary to permit the placing of loam and plants, for constructing roadways and any other miscellaneous earth excavation required under this Contract.

3.04 BACKFILLING – COMMON FILL

- A. Common Fill may be used as trench backfill; fill against exterior walls of structures (except water and retention structures) as indicated on the Drawings; as embankment fill; or in other areas as designated by the LWC Project Manager and the KYTC Resident Engineer. Material conforming to the requirements of common fill shall be placed in layers having a maximum thickness of 8 inches measured before compaction.

- B. Common Fill shall be compacted to at least 95% of maximum density as determined by ASTM D1557, D698.
- C. Materials placed in fill areas shall be deposited to the lines and grades shown on the Drawings making due allowance for settlement of the material and for the placing of loam thereon.
- D. No compacting shall be done when the material is too wet either from rain or from excess application of water. At such times, work shall be suspended until the previously placed and new materials have dried sufficiently to permit proper compaction.
- B. Common fill shall not be placed on a frozen surface or one covered by snow or ice, nor shall snow, ice or frozen material be incorporated into the compacted fill.

3.05 BACKFILLING - STRUCTURAL FILL

- A. Structural fill shall be placed in loose layers having a maximum thickness of 8 inches in open areas and 6 inches in confined areas including points where conduit and piping join structures, measured before compaction. Except for the 12 inches of structural fill placed beneath pavements, each layer of fill shall be compacted to at least 95% of maximum dry density determined by the ASTM D698 by methods approved by the LWC Project Manager and the KYTC Resident Engineer. The upper 12 inches of structural fill beneath pavement shall be compacted to 100% of the maximum dry density at moisture contents within 2% of the optimum value (ASTM D698). The limits of structural fill adjacent to structures shall extend as shown on the Drawings.
- B. Structural fill shall not be placed on a frozen surface or one covered by snow or ice, nor shall snow, ice or frozen earth be incorporated in the compacted fill.
- C. Compaction of structural fill in open areas shall consist of a heavy vibratory roller, or any method approved by the LWC Project Manager and the KYTC Resident Engineer. Compaction of structural fill in confined areas shall be accomplished by hand operated vibratory equipment or mechanical tampers approved by the LWC Project Manager and the KYTC Resident Engineer. As a minimum, compaction of structural fill shall consist of four coverage of the approved equipment.
- D. Working mat is required below all structures, as indicated on the Drawings; it shall consist of structural fill (12 inch minimum).

3.06 EARTH EMBANKMENTS-COMMON FILL

- A. All organic materials, including peat and loam, and loose inorganic silt material (loess) shall be removed from areas beneath new embankments and reconstructed slopes. If the subgrade slopes exceed 10 feet horizontal to 1 foot vertical, the subgrade shall be stepped to produce stable horizontal surfaces for the placement of the embankments or reconstructed slopes. The natural subgrade shall then be compacted to at least 95% of the maximum dry density at moisture contents within 2% below to 7% above the optimum moisture content (ASTM D698) by at least two coverage of a loaded six-wheel or ten-wheel truck. The LWC Project Manager and the KYTC Resident Engineer will waive this requirement, if, in his/her opinion, the subgrade will be rendered unstable by such compaction. The prepared subgrade shall be inspected and approved by the LWC Project Manager and the KYTC Resident Engineer prior to the placement of fill. If groundwater seepage or springs are encountered in the excavated horizontal steps, drainage shall be provided as directed by the LWC Project Manager and the KYTC Resident Engineer.

3.07 DISPOSAL OF SURPLUS MATERIAL

- A. No excavated materials shall be removed from the site of the work or disposed of, except as specified by the LWC Project Manager and the KYTC Resident Engineer. Materials shall be neatly piled so as to inconvenience as little as possible the public and adjoining property owners until used or otherwise disposed of as specified below.
- B. Suitable excavated material shall be used for fill embankments or backfill on the different parts of the work as required.
- C. Surplus fill shall become the property of the Contractor and shall be removed and disposed off site.

3.08 DISPOSAL AND REPLACING OF ROCK

- A. Remove and dispose of all pieces of ledge and boulders which are not suitable for use in other parts of the work. Rock disposed of by hauling away to spoil areas is to be replaced by approved surplus excavation obtained elsewhere on the work, insofar as it is available. Any deficiency in the backfill material shall be made up with acceptable material approved by the LWC Project Manager and the KYTC Resident Engineer.
- B. Fragments of ledge and boulders smaller than 50 lb. weight may be used in backfilling trenches unless in the opinion of the LWC Project Manager and the KYTC Resident Engineer the quantity is excessive, in which case he/she may order the removal and disposal of some of this rock. The small pieces of rock used as backfill shall not be placed in trenches until the pipe has at least 2 feet of earth over it. Place these pieces of stone in thin layers alternating them with earth to be sure that all voids between the stones are completely filled with earth to prevent the occurrence of voids and settlement which will result therefrom.
- C. Rock may be used in embankment fill only with the approval of the LWC Project Manager and the KYTC Resident Engineer.

3.09 GRADING

- A. Grading in preparation for placing of loam, planting areas, paved walks and drives and appurtenances shall be performed at all places that are indicated on the Drawings, to the lines, grades and elevations shown and otherwise as directed by the LWC Project Manager and the KYTC Resident Engineer and shall be performed in such a manner that the requirements for formation of embankments can be followed. All material encountered, of whatever nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, the subgrade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the prosecution or condition of the work.
- B. If at the time of grading it is not possible to place any material in its final location, it shall be stockpiled in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.
- C. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses, in order to obtain satisfactory construction.
- D. Stones or rock fragments larger than 4 inches in their greatest dimensions will not be permitted in the top 6 inches of the finished subgrade of all fills or embankments.

- E. In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as directed by the LWC Project Manager and the KYTC Resident Engineer.

3.10 EROSION CONTROL BLANKET

- A. Erosion control blankets shall be installed on slopes prior to the installing of riprap as directed by the LWC Project Manager and the KYTC Resident Engineer in accordance with manufacturer's instructions. The area to be covered shall be properly prepared, before the blanket is applied. When the blanket is unrolled, the netting shall be on top and the fibers in contact with the soil over the entire area. The blankets shall be butted snugly at the ends and side and stapled. Blankets shall be placed a minimum of three rows (of four foot) wide (total 12 foot width) and stapled together in accordance with manufacturer's instructions. The staples shall be made of wire, 0.091 inches in diameter or greater, "U" shaped with legs 6 inches in length and a 1 inch crown. The staples shall be driven vertically into the ground, spaced approximately two linear yards apart, on each side, and one row in the center alternately spaced between each side. Adjoining blankets shall not be overlapped and shall utilize a common row of staples to attach.

3.11 RIPRAP FOR SLOPE PROTECTION

- A. Unless otherwise authorized by the LWC Project Manager or the KYTC Resident Engineer, the riprap protection shall be placed in conjunction with the construction of the embankment with only sufficient lag in the construction of the riprap protection as may be necessary to allow for proper construction of the portion of the embankment protected and to prevent mixture of embankment and riprap material. Bank run gravel shall be placed and graded to a depth of 6 inches to obtain a continuous uninterrupted bed of the required thickness within the required limits. It shall be compacted by a minimum of one coverage by a crawler-type tractor with a total weight, including blade and equipment, of not less than 30,000 lbs.
- B. Riprap shall be hand-placed on the prepared bed of compacted gravel base. Stones shall be laid so that the maximum dimension is perpendicular to the prepared bed. The stones shall be placed so that the weight of the stone is carried by the underlying material and not by the adjacent stones. Large stones shall be placed at the bottom of the slope. Spaces between stones shall be filled with spalls of suitable size to construct a solid, stable slope, free from large voids and defects which might not protect the earth slopes against erosion.

3.13 GRADING AND SEEDING

- A. Grading in preparation for placing loam and seeding shall be done at all excavations and in all areas disturbed by operations. Surfaces shall be restored to their original grade and condition. The subgrade shall be maintained in a condition that will be well drained.
- B. The subgrade shall be raked and all rubbish, sticks, roots and stones larger than $\frac{3}{4}$ inch shall be removed. Loam or topsoil salvaged from the excavation shall be spread to a depth sufficiently higher than required so that after natural settlement and light rolling the finish grade will match the surrounding area. Loam depth shall be 6 inches minimum in its settled and rolled state.
- C. Grass seed shall be a commercial blend approved by the LWC Project Manager and the KYTC Resident Engineer and lightly raked into the surface in accordance with package directions. All seeded areas shall be protected and shall be watered as required until a firm dense growth has been established.

END OF SECTION

SECTION 02221

TRENCHING, BACKFILLING AND COMPACTION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform all trenching for pipelines and appurtenances, including drainage, filling, backfilling, disposal of surplus material and restoration of trench surfaces and easements.
- B. Excavation shall extend to the width and depth shown on the Drawings or as specified herein and shall provide suitable room for installing pipe, structures and appurtenances.
- C. Furnish and place all sheeting, bracing and supports and shall remove from the excavation all materials which the LWC Project Manager or the KYTC Resident Engineer may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry and in all respects, acceptable. If conditions warrant, deposit gravel for pipe bedding, or gravel refill for excavation below grade, directly on the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatever. The length of open trench shall be related closely to the rate of pipe laying but in no case shall exceed 50 feet. All excavation shall be made in open trenches.
- D. All excavation, trenching and related sheeting, bracing, etc, shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- E. Wherever the requirement for 95% compaction is referred to herein it shall mean "at least 95% of maximum density as determined by ASTM D1557, Method D".
- F. Prior to the start of work, submit the proposed method of backfilling and compaction to the LWC Project Manager and the KYTC Resident Engineer for review.

1.02 RELATED WORK

- A. Granular fill materials are included in Section 02200

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 TRENCH EXCAVATION

- A. Trench excavation shall include material of every description and of whatever substance encountered. Pavement shall be cut with a saw, wheel or pneumatic chisel along straight lines before excavating.
- B. Strip and stockpile topsoil from grassed areas crossed by trenches. At the Contractor's option, topsoil may be otherwise disposed of and replaced, when required, with approved topsoil of equal quality.

- C. While excavating and backfilling is in progress, traffic shall be maintained, and all utilities and other property protected as provided in the General Conditions and General Requirements.
- D. Trenches shall be excavated to the depth indicated on the Drawings or in critical areas as recommended by the Geotechnical Engineer, whichever is deeper and in widths sufficient for laying the pipe, bracing and for pumping and drainage facilities. The bottom of the excavations shall be firm and dry and in all respects acceptable to the LWC Project Manager and the KYTC Resident Engineer. Trench width shall be practical minimum.
- E. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. The trench may be excavated by machinery to, or just below the designated subgrade, provided that material remaining in the bottom of the trench is no more than slightly disturbed. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by screened gravel fill as required by the LWC Project Manager and the KYTC Resident Engineer at the Contractor's expense.
- F. Clay and silt soils are particularly susceptible to disturbance due to construction operations. When excavation is to end in such soils, use a smooth-edge bucket to excavate the last 1 foot of depth.
- G. Where pipe is to be laid in screened gravel bedding, the trench may be excavated by machinery to the normal depth of the pipe provided that the material remaining in the bottom of the trench is no more than slightly disturbed.
- H. Where pipe is to be laid directly on the trench bottom, final excavation at the bottom of the trench shall be performed manually, providing a flat-bottom true to grade upon undisturbed material. Bell holes shall be made as required.

3.02 DISPOSAL OF MATERIALS

- A. Excavated material shall be stacked without excessive surcharge on the trench bank or adjacent slopes or obstructing free access to hydrants and gate valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.
- B. It is expressly understood that no excavated material shall be removed from the site of the work or disposed of, except as directed by the LWC Project Manager or the KYTC Resident Engineer. When removal of surplus materials has been approved by the LWC Project Manager or the KYTC Resident Engineer, dispose of such surplus material in approved designated areas.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench or on hillside slopes, the material shall be hauled and stored at a location provided. When required, it shall be re-handled and used in backfilling the trench.

3.03 SHEETING AND BRACING

- A. Furnish, put in place and maintain sheeting and bracing required by Federal, State or local safety requirements to support the sides of the excavation and prevent loss of ground which could endanger personnel, damage or delay the work or endanger adjacent structures. If the LWC Project Manager or the KYTC Resident Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he/she may order additional supports placed at the

expense of the Contractor. Compliance with such order shall not relieve the Contractor from his/her responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

- B. Where sheeting and bracing is required to support the sides of trenches, engage a professional engineer, registered in the Commonwealth of Kentucky, to design the sheeting and bracing. Submit design calculations and drawings of the shoring, bracing, or retention system for review. The sheeting and bracing installed shall be in conformity with the design and certification of this shall be provided by the professional engineer. Submit P.E. Certification Form contained in Section 01300 to show compliance with this requirement.
- C. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the screened gravel backfill.
 - 1. When installing ductile iron, or pre-stressed concrete cylinder pipe, any portion of the box extending below mid diameter shall be raised above this point prior to moving the box ahead to install the next pipe. This is to prevent the separation of installed pipe joints due to movement of the box.
 - 2. When installing flexible pipe (PVC, etc), trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below mid-diameter of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, screened gravel shall be placed to fill any voids created and the screened gravel and backfill shall be recompact to provide uniform side support for the pipe.
- D. Permission will be given to use steel sheeting in lieu of wood sheeting for the entire job wherever the use of sheeting is necessary. The cost for use of sheeting will be included in the bid items for pipe and shall include full compensation for driving, bracing and later removal of sheeting.
- E. All sheeting and bracing shall be carefully removed in such manner as not to endanger the construction of other structures, utilities, or property, whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, by watering or otherwise as directed.
- F. No payment will be given for sheeting, bracing, etc, during the progress of the work. No payment will be given for sheeting which has actually been left in the trench for the convenience of the Contractor.
- G. Sheeting driven below mid-diameter of any pipe shall remain in place from the driven elevation to at least 1 foot above the top of the pipe.

3.04 TEST PITS

- A. Excavation of test pits may be required for the purpose of locating underground utilities or structures as an aid in establishing the precise location of new work.
- B. Test pits shall be backfilled in accordance with the requirements for trench backfill as soon as the desired information has been obtained. The backfilled surface shall be maintained in a satisfactory condition for travel until resurfaced as specified.

3.05 EXCAVATION BELOW GRADE AND REFILL

- A. Whatever the nature of unstable material encountered or the groundwater conditions, trench drainage shall be complete and effective.
- B. If the Contractor excavates below grade through error or for the Contractor's own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, he may be directed by the LWC Project Manager or the KYTC Resident Engineer to excavate below grade as set forth in the following paragraph, in which case the work of excavating below grade and furnishing and placing the refill shall be performed at his own expense.
- C. If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into the screened gravel notwithstanding effective drainage, the subgrade material shall be removed to the extent directed and the excavation refilled with a 6 inch layer of coarse sand, or a mixture graded from coarse sand to the fine peastone, as approved by the LWC Project Manager and the KYTC Resident Engineer, to form a filter layer preserving the voids in the gravel bed of the pipe. The composition and gradation of gravel shall be approved by the LWC Project Manager and the KYTC Resident Engineer prior to placement. Screened gravel shall then be placed in 6 inch layers thoroughly compacted up to the normal grade of the pipe. If directed by the LWC Project Manager or the KYTC Resident Engineer, compacted structural fill shall be used for refill of excavation below grade.
- D. Geotextile filter fabric may be substituted for filter layer if approved by the LWC Project Manager and the KYTC Resident Engineer. Filter fabric shall be Mirafi 140N; Supac equivalent, or equal.

3.06 BACKFILLING

- A. As soon as practicable after the pipe has been laid and jointed, backfilling shall begin and thereafter be prosecuted expeditiously. Bedding gravel, as specified for the type of pipe installed, shall be placed up to 1 foot over the pipe.
- B. If water restrictions are in force, obtain water elsewhere, or compact the backfill by other approved methods at no additional cost to this Contract.
- C. Where other methods are not practicable, compaction shall be by use of hand or pneumatic ramming with tools weighing at least 20 lbs. The material being spread and compacted in layers not over 6 inches thick for structural fill, crushed stone and screened gravel for structural fill, and not over 4 inches thick for common fill and select common fill. If necessary, sprinkling shall be employed in conjunction with rolling or ramming to achieve the necessary moisture content for compaction.
- D. Backfill around structures shall be selected common fill material, may be compacted by puddling where approved by the LWC Project Manager and the KYTC Resident Engineer. All backfill shall be compacted, especially under and over pipes connected to the structures.
- E. Bituminous paving shall not be placed in backfilling unless specifically permitted, in which case it shall be broken up as directed. Frozen material shall not be used under any circumstances.
- F. All road surfaces shall be broomed and hose-cleaned immediately after backfilling. Dust control measures shall be employed at all times.

3.07 RESTORING TRENCH SURFACE

- A. Where the trench occurs adjacent to paved streets, in shoulders, sidewalks, or in cross-country areas, thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, immediately deposit additional fill to restore the level of the ground.
- B. In and adjacent to streets, the top 12 inch layer of trench backfill shall consist of low strength mortar backfill where required or compacted structural fill or crushed stone. Should the Contractor wish to use material excavated from the trench as gravel subbase for pavement replacement, the Contractor, at his/her own expense, have samples of the material tested by an independent testing laboratory at intervals not to exceed 500 feet, in order to establish its compliance with the specifications. Only material which has been tested and approved by the LWC Project Manager and the KYTC Resident Engineer shall be allowed to be incorporated into the work.
- C. The surface of any driveway or any other area which is disturbed by the trench excavation and which is not a part of the paved road shall be restored to a condition at least equal to that existing before work began.
- D. In sections where the pipeline passes through grassed areas, and at the Contractor's own expense, remove and replace the sod, or loam and seed the surface to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer.
- E. Where excavations are made into existing slopes and embankments, the slopes and embankments shall be reconstructed to original grades in accordance with Specification Section 02200, paragraph 3.08.A-1, Earth Embankments, Common Fill.

END OF SECTION

SECTION 02605

PRECAST CONCRETE STRUCTURES

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment required and install precast concrete structures, access hatches, and appurtenances as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Earthwork is included in Section 02200.
- B. Cast-in-place concrete is included in Section 03300.

1.03 SUBMITTALS

- A. Submit, in accordance with Section 01300, shop drawings, product data, materials of construction, and details of installation. Submittals shall include the following:
 - 1. Structure openings.
 - 2. Access frame and cover with notarized certificate indicating compliance with ASTM A48, Class 30.
 - 3. Method of repair for minor damage to precast concrete sections.
- B. Samples
- C. Design Data
 - 1. Precast concrete structures:
 - a. Sectional plan(s) and elevations showing dimensions and reinforcing steel placement.
 - b. Structural calculations including assumptions.
 - c. Concrete design mix.
- D. Test Reports
 - 1. Precast concrete structures:
 - a. Concrete test cylinder reports from an approved testing laboratory certifying conformance with this Section.
- E. Certificates as required

F. Manufacturers Installation

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM A48 - Standard Specification for Gray Iron Castings.
2. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
3. ASTM C33 - Standard Specification for Concrete Aggregates.
4. ASTM C150 - Standard Specification for Portland Cement.
5. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.

B. American Concrete Institute (ACI)

1. ACI 318 - Building Code Requirements for Structural Concrete
2. ACI 350R - Environmental Engineering Concrete Structures

C. American Association of State Highway and Transportation Officials (AASHTO)

1. Standard Specifications for Highway Bridges

D. Occupational Safety and Health Administration (OSHA)

E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. All material shall be new and unused.

B. Materials' quality, manufacturing process and finished sections are subject to inspection and approval by LWC Project Manager or the KYTC Resident Engineer. Inspection may be made at place of manufacture, at work site following delivery, or both.

C. Materials will be examined for compliance with ASTM standards, this Section and approved manufacturer's drawings. Additional inspection criteria shall include: appearance, dimensions(s), blisters, cracks and soundness.

D. Materials shall be rejected for failure to meet any requirements specified herein. Rejection may occur at place of manufacture, at work site, or following installation. Mark for identification rejected materials and remove from work site immediately. Rejected materials shall be replaced at no additional cost to Owner.

- E. Repair minor damage to precast concrete sections by approved method, if repair is authorized by LWC Project Manager or the KYTC Resident Engineer.

PART 2: PRODUCTS

2.01 GENERAL

- A. Reference to a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- B. Like items of materials/equipment shall be the end products of one manufacturer in order to provide standardization for appearance, operation, maintenance, spare parts and manufacturer's service.
- C. Provide lifting lugs or holes in each precast section for proper handling.

2.02 PRECAST CONCRETE STRUCTURES

- A. Precast reinforced concrete structures shall be manufactured by Thorn-Orwick, Inc. or equal. Refer to Drawings for inside dimensions, headroom requirements and other installation requirements.
- B. Manufacturer shall notify LWC Project Manager and the KYTC Resident Engineer at least 5 working days prior to placing concrete during manufacturing process. LWC Project Manager or the KYTC Resident Engineer may inspect reinforcing steel placement prior to placing concrete.
- C. Structural design calculations and Drawings shall be prepared and stamped by a Professional Engineer registered in Kentucky and submitted with the Shop Drawings.
- D. Design Criteria
 - 1. Precast concrete
 - a. Minimum compressive strength shall be 4,500 psi at 28 days.
 - b. Maximum water-to-cement ratio shall be 0.40 by weight.
 - c. Minimum cement content shall be 600 lbs of cement per cubic yard of concrete.
 - 2. Manufactured products
 - a. Conform to ACI 318 and ACI 350R.
 - b. Analyze walls and slabs using accepted engineering principals.
 - c. When "fy" exceeds 40,000 psi, "z" (ACI 318) shall not exceed 95 kips/in, "fs" shall be completed and shall not exceed 50 percent of "fy".

- d. Design products to support their own weight, weight of soil at 130 pcf, and a live load equal to AASHTO HS-20 applied to top slab.
- e. Cast base slab and walls together to form a monolithic base section.
- f. Design structure walls for a lateral pressure based on an equivalent fluid unit weight of 90 pounds per cubic foot (pcf). Originate pressure diagram at finished ground surface. Include lateral pressure from vehicles in accordance with AASHTO.
- g. Consider discontinuities in structure produced by openings and joints. Provide additional reinforcing around openings. Frame openings to carry full design loads to support walls.
- h. Prevent flotation, with ground water level at finished ground surface, by dead weight of structure and soil load above structure. Do not consider skin friction, soil friction, or weight of equipment in structure.
- i. Locate horizontal wall joints 18-in minimum from horizontal centerline of wall openings.
- j. Design structure with a minimum number of joints. Maximum number of structure sections, including top slab, shall be four.
- k. Provide lifting hooks for top slab.
- l. Locate access openings, wall sleeves and pipe penetrations as shown on Drawings.
- m. Wall sleeves for pipes shall be provided by the precast concrete manufacturer.

2.03 PIPE CONNECTIONS

- A. Wall Sleeves (pass through pipe vaults) – Provide steel or ductile iron pipe sleeve cast into wall. Annular space between pipe and sleeve to be sealed with mechanical seal, Linkseal or equal.

2.04 DAMPPROOFING

- A. Dampproofing shall be Hydrocide 648 by Sonneborn Building Products; Dehydratine 4 by A.C. Horn Inc; Meadows Trowel Mastic (Type 3) or equal.

2.05 ACCESS FRAME AND COVER

- A. Manhole frames and covers shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind which render them unfit for the service for which they are intended. Manhole covers and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30.

- B. Manhole covers shall have a diamond pattern and pickholes and covers shall be Neenah Foundry or equal.

PART 3: EXECUTION

3.01 INSTALLATION

A. Structure Installation

- 1. Structures shall be constructed to the dimensions shown on the Drawings and as specified herein. Protect all work against flooding and flotation. Construct cast-in-place bases in accordance with the requirements of Division 3 and the details shown on the Drawings.

B. Dampproofing

- 1. Paint outer surfaces of precast structures with two coats of bituminous dampproofing at the rate of 30 to 60 sq ft per gallon, in accordance with manufacturer's instructions.
- C. The LWC Project Manager and the KYTC Resident Engineer will visually inspect structure(s) for possible leaks before backfilling of structures is allowed. Seal all joints to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer.
- D. Thoroughly clean all new structures of all silt, debris and foreign matter of any kind, prior to final inspections.

END OF SECTION

SECTION 02616

DUCTILE IRON PIPE AND FITTINGS

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required, install, disinfect and test 36-inch ductile iron pipe and fittings as shown on the Drawings and as specified herein as an alternative pipe material.
- B. Piping shall be located as shown on the Drawings. The LWC Project Manager and the KYTC Resident Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference between pipes or other utility lines. Pipe fitting notation is for the Contractor's convenience and does not relieve him/her from installing and jointing different or additional items where required to achieve a complete piping system.
- C. Where the word "pipe" is used it shall refer to pipe, fittings, or appurtenances unless otherwise noted.

1.02 RELATED WORK

- A. Pipe testing and cleaning is included in Section 01445.
- B. Trenching, Backfilling and Compaction is included in Section 02221.
- C. Valves are included in Section 15100.

1.03 SUBMITTALS

- A. Submit shop drawings, product data, piping layouts, design calculations, warranty information, test reports, and manufacturer's literature in accordance with Section 01300 referenced standards.
- B. Submit design calculations for record purposes only in accordance with Paragraph 2.02 below signed by a Professional Engineer licensed in Kentucky, as noted in Section 01300. This includes all load combinations and pipe restraint requirements.
- C. Submit the name of the pipe and fitting suppliers and a list of materials to be furnished.
- D. Prior to shipment of pipe, certified copies of mill tests confirming the type of materials used in the pipe, and shop testing of pipe to show compliance with the requirements of the applicable standards, along with a sworn affidavit of compliance that the pipe complies with the referenced standards, shall be submitted.
- E. Submit copies of all shop tests, including hydrostatic tests.
- F. Submit information on all warranties per Section 01740.
- G. Submit shop drawings with a tabulated laying schedule which references stations and invert elevations as shown on the Drawings as well as all fittings, bends, outlets, restrained joints, tees, special deflection bells, adapters, solid sleeves and specials, along with the manufacturer's

drawings and specifications providing complete details of all items. The laying schedule shall show pipe class and class coding. The above shall be submitted to the LWC Project Manager via the KYTC Resident Engineer for approval before manufacture and shipment. Full length pipe may be supplied from inventory provided that all specification requirements are met. Shop drawings shall include but not be limited to:

1. Complete and dimensional working drawings of all pipe layouts, including pipe stationing, invert elevation at changes in grade or horizontal alignment, all elements of curves and bends both in horizontal alignment and vertical position.
2. The grade of material; size, wall thickness, of the pipe and fittings and appurtenances, type and location of fittings, specials, and valves; and the type and limits of the lining, lining reinforcing and coating systems of the pipe and fittings. Methods and procedures recommended by the coating manufacturer will be documented.
3. Joint details; methods and locations of supports, and complete information concerning type, size and location of all welds. Shop welds (no field welding will be allowed) will be clearly differentiated and welds will be clearly detailed with preparation procedures for all pipe and parent material comprising each weld. Critical welding procedures will be identified along with methods for controlling welding stresses and distortions. Locations and proposed joint details will also be clearly identified.
4. Method of manufacture of pipe; joint details; fittings; and any specials.
5. All other pertinent information for all items to be furnished; product data to show compliance of all couplings, supports, fittings, coatings and related items.

H. Submit anticipated production and delivery schedule.

I. Prior to shipment of pipe, submit a certified affidavit of compliance from the manufacturer stating that the pipe, fittings, gaskets, linings and exterior coatings for this project have been manufactured and tested in accordance with AWWA and ASTM standards and requirements specified herein.

J. Submit handling procedures for all phases from finished fabrication through delivery including storage, transportation, loading, and unloading. Submit Catalog cuts and installation instructions for boltless restrained joint pipe and mechanically restrained connections to valves. Contract shall also submit Certification that all bolts to be furnished conform to referenced standards.

K. This will include storage at the project site and required protection following installation prior to startup.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
2. ASTM A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
3. ASTM A242 – Standard Specification for High-Strength Low-Allow Structural Steel

4. ASTM A307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
5. ASTM A674 – Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids.
6. ASTM C150 - Standard Specification for Portland Cement.

B. American Water Works Association (AWWA)

1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-in through 48-in (75mm through 1219mm) for Water.
4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
6. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water.
7. AWWA C115 – Flanged Ductile Iron Pipe with Ductile Iron or Grey Iron Threaded Flanges.
8. AWWA C116 – Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior surfaces of Ductile Iron and Grey Iron Fittings for Water Supply Service.
9. AWWA C153 - Ductile- Iron Compact Fittings, 3-in through 24-in and 54-in through 64-in, for Water.
10. AWWA C550 – Protective Interior Coatings for Valves and Hydrants
11. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
12. AWWA C606 - Grooved and Shouldered Joints.
13. AWWA C651 - Disinfecting Water Mains.
14. AWWA M41 – Ductile Iron Pipe and Fittings Manual of Water Supply Practices

C. National Sanitation Foundation (NSF)

1. NSF 61 – Drinking Water System Components Health Effects.

D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. It is a requirement of these Contract Documents to have the entire ductile iron pipe under this section designed and supplied by a single manufacturer rather than have selection and supply of these items by a number of different manufacturers. Similarly. It is a requirement of these Contract Documents to have all of the ductile iron fittings under this section designed and supplied by a single manufacturer rather than have selection and supply of these items by a number of different manufacturers. All connections between the pipe and fittings shall be compatible, as detailed in Section 1.06.
- B. Each length of ductile iron pipe supplied for the project shall be hydrostatically tested at the point of manufacture to 500 psi for a duration of 10 seconds per AWWA C151. Testing may be performed prior to machining bell and spigot. Failure of ductile iron pipe shall be defined as any leak or rupture of the pipe wall. Certified test results shall be furnished in duplicate to the LWC Project Manager prior to time of shipment.
- C. All ductile-iron pipe and fittings to be installed under this project shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. Furnish in duplicate to the LWC Project Manager via the KYTC Resident Engineer sworn certificates of such tests and their results at least 5 days prior to the shipment of the goods. The cost of foundry inspection of all pipe approved for this contract, plus the cost of inspection of a reasonable amount of disapproved pipe will be borne by the Louisville Water Company.
- D. Inspection of the pipe and fittings will also be made by the representative of the Louisville Water Company after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements even though pipe may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery (including defects from manufacturing or delivery/transport) shall be marked for identification and shall immediately be removed from the job at the Contractors expense.
- E. All pipe and fittings to be installed under this Contract may be inspected at the plant for compliance with this Section by an independent testing laboratory selected by the Louisville Water Company at the Louisville Water Company's expense.
- F. A manufacturer's representative shall be made available to the Louisville Water Company's representative during the manufacturing, furnishing, transporting, and unloading of the pipe; during installation and testing of the pipe to assist in insuring that the pipe is properly fabricated, transported, unloaded, stored in the field, joined and tested. Manufacturer's responsibilities relate only to the proper care and treatment of the pipe during these procedures and not the techniques or procedures used during installation and testing.
1. The designated factory representative shall be made available at any time the Louisville Water Company may request. The field or site representative shall be made available a minimum of 10 working days (time on site) during the project when requested by the Louisville Water Company.
 2. The cost for the services of the factory representative, including expenses, shall be considered incidental to the project and will not be paid separately.
- G. The manufacturer shall meet the following criteria and furnish the necessary project information, which demonstrates the required experience:
1. Ductile iron pipe and fittings shall be manufactured by an LWC pre-qualified vendor. Prequalified LWC DIP vendors include Mueller Pipe, American Cast Iron Pipe Company, Griffin Pipe Co., and the McWane Company or approved equal.

2. Experience that includes successful fabrication (followed by installation, acceptance and service) to AWWA C151 standards of at least 50,000 lineal feet of the largest specified diameter or larger ductile iron pipe with similar linings/coatings within the past 5 years.
 3. Experience shall include the successful fabrication of at least 50- fittings in compliance with AWWA C110 or C153 of the largest specified diameter or larger with similar lining/coatings within the past 5 years.
 4. Experience that includes the successful fabrication (followed by installation, acceptance and service) of at least 10,000 lineal feet of the largest specified diameter or larger push-on style, boltless restrained joint for ductile iron pipe within the last 5 years.
- H. All pipe and fittings shall be marked in accordance with all applicable AWWA standards. Legibly and permanently mark all pipe, fittings, specials and appurtenances to be consistent with the laying schedule and marking drawings with the following information:
1. Manufacturer' name, trademark or identification number.
 2. Date of manufacture.
 3. Size, type, class, and wall thickness.
 4. AWWA Standard(s) produced to.
 5. Each pipe shall be identified with sequential numbering consistent with the laying schedule and marking drawings and each marked pipe will appear on the marking drawings in the identified location for installation.
 6. Special fittings, bends, and appurtenances requiring specific orientation will be appropriately marked with the words "TOP" in the correct position and in a consistent location.
- I. Within 10 days after bid opening, the manufacturer proposed for supplying the ductile iron pipe to the apparent low bidder shall submit to the LWC Project Manager via the KYTC Resident Engineer through the bidder a list of five similar projects successfully manufactured at the proposed plant, installed and in operation, including for each – pipe diameters and lengths; project name and location; consulting engineer's name, address, phone number, and reference contact; installation contractor's name, address, phone number, and reference contact; owner's name, address, phone number, and reference contact.
- 1.06 DESCRIPTION OF SYSTEMS
- A. Pipe and fittings shall be as supplied by the American Cast Iron Pipe Co., U.S. Pipe and Foundry, Griffin Pipe Products, the McWane Company or an equal who is a member of the Ductile Iron Pipe Research Association (DIPRA). All ductile iron pipes shall be supplied by a single manufacturer and all ductile iron fittings shall be supplied by the pipe manufacturer.
 - B. Pipe is to be installed in those locations shown on the Drawings, and only where specifically indicated.
 - C. Contractor is responsible for compatibility between joints of all items they supply.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe, pipe linings and pipe coatings. See AWWA C600 and the referenced AWWA Standards for Shipping, handling and storage procedures. All pipe and fittings shall be examined as noted in Division 1. Any damage to linings or coatings discovered during the examination shall be repaired to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer at the cost of the Contractor, before proceeding with the work.
- B. Pipe shall be transported to the job site on padded bunks or oak timbers and secured with steel banding or nylon tie down straps to adequately protect the pipe and coating. Slings, acceptable to the LWC Project Manager shall be used in pipe handling. No uncushioned ropes, chairs, wedges, cables, forks, or levers shall be used in handling finished pipe, fittings or couplings. Under no circumstances shall forks or other construction equipment be inserted into the pipe for movement. Under no circumstances shall the pipe or fittings be dropped or skidded against each other. Care shall be taken to preventing marring the pipe coating. Padded wooden pipe cradles, or chocks suitable for the protection of coatings shall be used between finished pipes and beneath them when pipes are placed upon rough surfaces. Pipe shall not be stored on bare ground unless soft sand berms are used to support the pipe and is approved by the LWC Project Manager.
- C. Materials, if stored, shall be kept safe from damage. The interior of all pipes, fittings and other appurtenances shall be kept free from dirt, excessive corrosion or foreign matter at all times.
- D. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall conform to manufacturer's recommendations and/or AWWA C600.
- E. Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.
- F. Lined and/or coated pipe shall be suitably protected from exposure and heating of the sun at all times following procedures recommended by the coating/lining system manufacturer. Exposure will not be allowed (except for short periods such as installation, assembly and repairs).
- G. No metal tools or heavy objects shall be permitted to come in contact unnecessarily with the finished coating. Workers will be permitted to walk upon the coated pipe only when necessary, in which case they shall wear footwear with rubber or composition soles and heels that are sufficiently free of dirt and mud that coating remains undamaged.
- H. It shall be the responsibility of the Contractor to prevent damage to the linings and coatings that might be caused by handling and/or onsite storage of the finished pipe at low temperatures (due to embrittlement), high temperatures or direct sunlight.

1.08 WARRANTIES

- A. Provide warranties as required in Section 01740.

PART 2: PRODUCTS

2.01 MATERIALS

- A. Ductile iron pipe shall conform to AWWA C151. Pipe shall be supplied in standard lengths.
- B. Thickness design shall be per AWWA C150 and provide minimum Class 250 for 24-inch transmission main and Class 350 for 4-20 inch distribution main. The pipe supplier shall perform thickness analysis as referenced in Paragraph 2.02. All ductile iron pipe supplied shall meet the minimum wall thickness and pressure class.
- C. Ductile iron pipe shall conform to the latest specifications as adopted by American National Standards Institute, Inc., (ANSI) and American Water Works Association (AWWA). Specifically, ductile iron pipe shall conform to ANSI/AWWA C151/A21.51.
- D. The pipe shall be coated outside with a bituminous coating in accordance with ANSI/AWWA C151/A21.51. The pipe interior shall be lined with cement mortar and seal coated in compliance with the latest revision of ANSI/AWWA C104/A21.4.
- E. The pipe shall be encased in a double layer of polyethylene as shown on the Drawings and specified herein.

2.02 DUCTILE IRON PIPE DESIGN

- A. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with minimum yield strength of 42,000 psi (per AWWA M-41). Design shall be done for external and internal pressures separately using the larger of the two for the net design thickness. Additional allowances shall be made for service allowance and casting tolerance per AWWA C150. The pipe classes determined for various sizes and conditions shall provide the total calculated thickness at a minimum or conform to minimum pipe class.
- B. Design for the net thickness for external loading shall be taken as the greater of the following conditions:
 - 1. 2-1/2-ft of cover with AASHTO H-20 wheel loads, with an impact factor of 1.5.
 - 2. Depth from existing ground level of future proposed grade (whichever is greater) to top of pipe as shown on the Drawings, with truck load.
 - 3. Soil Density: 110 lbs. per cu ft.
 - 4. Laying Conditions; AWWA C150, Type 5.
- C. Design for the net thickness shall be based upon the following internal pressure conditions:
 - 1. Design pressure: 175 PSIG
 - 2. Surge allowance: 100 PSIG
 - 3. Safety factor: 2

4. Total internal pressure design: $2 ([175] + [100]) = [550]$ PSIG
 5. E': [700] psi
- D. Copies of design calculations showing that the pipe meets all of the requirements specified herein shall be furnished to the LWC Project Manager via the KYTC Resident Engineer for approval during shop drawing review in accordance with Section 01300. A yield strength of 42,000 psi shall be used during design calculations.
- E. Restrained Joints:
1. The entire 24-inch replacement shall include restrained joints at each joint. In addition, thrust blocks are required at every bend and tee and at each tie-in point. 4-20-inch main do not require restrained joints but shall include thrust blocks per LWC standard specifications.
 2. Pipe joints for the 24-inch pipe shall be proprietary designs using a factory welded retainer ring on the spigot. The following manufacturers' products are approved: American Lok Ring, American Flex Ring (for pipe diameter 48-inch and less), Griffin Snap Lok, Griffin Bolt Lok, and U.S. Pipe TR Flex.
 3. The restrained joint system shall meet or exceed the test pressures outlined in Specification Section 01445.
 4. When restrained joints are required, they shall be boltless push-on type. Boltless restrained joints shall be either U.S. Pipe & Foundry "TR Flex", American Ductile Iron Pipe "Flex-Ring", or equal. Restrained joint pipe shall be furnished with a factory welded retaining ring. Utilize a positive mechanical restraint such as American's Coupling Gland Ends, or equal. The use of friction type restrained joints such as Megalugs shall not be allowed.
- F. The 24-inch pipe system shall be limited to one pipe thickness and shall be clearly marked on the pipe and shall be minimum pressure class 250 suitable for a minimum depth of covers of 15 feet.

2.03 END TREATMENTS/JOINTS

- A. All ductile iron pipe/fitting joints shall be push-on rubber gasket type restrained, except where flanged joints are required as shown on the drawings. Restrained joints shall be push on rubber gasket, locking ring type restrained joints per the manufacturer' standard described in Paragraph B, except where flange joints are shown on the Drawings. All gasket materials shall comply with Table 5-1 of AWWA M-41. Rubber-gasket joints shall conform to AWWA C111 and suitable for chlorinated and chloraminated water. Gasket shall be of styrene butadiene rubber (SBR).
- B. Restraint for push on joint pipe shall be positive locking "Locked-type" joints manufactured by the pipe and fitting manufacturer that utilize restraint independent of the joint gasket. All restrained joints shall be suitable for the specified 300 PSIG test pressure. Joints shall be fabricated of heavy section ductile iron casting. Restrained push on joints shall be by one of the following or an approved equal:
- "TR Flex" by Mueller

- "Lok-Ring", "Flex Ring" (positive locking style)" by the American Cast Iron Pipe Company
 - "Snap Lok" by Griffin Pipe Products Company.
 - "Superlok" by Clow Water Systems Company
1. The minimum number of restrained joints required for resisting forces at fittings and changes in direction of the pipe shall be determined from the length of restrained pipe on each side of the fittings and changes in direction necessary to develop adequate resisting friction with the soil, The required lengths of restrained joints shall be as shown on the Drawings.
 2. Restrained pipe joints that achieve restraint by incorporating cut out sections in the wall of the pipe shall have a minimum wall thickness at the point of the cut out that corresponds with the minimum specified wall thickness for the rest of the pipe.
- C. Threaded ductile iron flanges for ductile iron pipe shall be fabricated per AWWA C115 and sealed during installation with a special high pressure, full face gasket per AWWA C111. At the pipe manufacturer's option, the use of 250 lb pattern flanges, which are faced and drilled in accordance with ANSI B16.1 may be substituted in order to match valves or other equipment and/or to meet the required working pressure requirements. All flanges shall be rated for the same pressure as the adjacent pipe in all cases. Compatibility of the flanges with the 250 lb class and higher special class AWWA valves will be the responsibility of the Contractor.
1. Flanges shall be pre drilled and then faced after being screwed onto the pipe, with flanges true to 90 degrees of the pipe axis and shall be flush with the end of the pipe.
 2. Gaskets shall be full face rubber, 1/8" thick SBR material. Such as American Torseal Gasket, or approved equal.
 3. Flanged joints shall be supplied with bolts and nuts on one end, bolt studs with a nut at each end, or studs with nuts on one end where the flange is tapped. The number and size of bolts shall comply with the same standard as the flange. Bolts and nuts shall, except as otherwise specified or noted in the Specifications or on the Drawings, comply with ASTM A193, grade B7.
 4. Blind flanges shall mate with regular flanges.
 5. Filler flanges and beveled flange fillers shall be furnished faced and drilled complete with extra length bolts.
- D. Couplings and Adapters
1. Sleeve type couplings shall be Dresser Style 38, 138 or equal.
 - a. Buried sleeve-type couplings shall have a protective wrapping of "Denso" material by DENSO Inc. of Texas or equal. Where "Denso" material is used, the joint shall be packed up with "Densyl mastic" to give an even contour for wrapping with "Densopol" tape. A 1.5 mm thick coating of "Denso" paste shall be applied following by 100 mm or more wide "Densopol" tape wound spirally round the joint with at least 50 percent overlap.
 2. Split Sleeve type flexible couplings shall be Victaulic Depend-O-Lok Style or F x F (self-restrained) or equal.

3. Grooved flexible joints for ductile iron pipe sizes 24-in and smaller must be in accordance with AWWA C606 and shall be Victaulic Style 31 or equal.
4. Shouldered flexible joints for ductile iron pipe larger than 24-in shall be Victaulic Style 44 or equal.

2.04 FITTINGS

- A. Pipe fittings shall be ductile iron with pressure rating of 250 psi for the 36-inch pipe. Fittings shall meet the requirements of ANSI/AWWA C110/A21.0 or AWWA C153 as applicable. Fittings shall have the same pressure rating, as a minimum, of the connecting pipe.
- B. Closures shall be made with mechanical joint ductile iron solid sleeves unless alternate approved coupling systems are used and shall be located in straight runs of pipe at minimum cover outside the limits of restrained joint sections. Location of closures shall be subject to approval of the LWC Project Manager.

2.05 INTERIOR LINING

- A. Ductile iron pipe and fittings shall have the same type of lining as specified herein.
- B. Ductile iron pipe and fittings shall have a cement mortar lining in accordance with AWWA C104 double thickness. The cement shall be Type I or II per ASTM C150.
- C. At the option of the supplier, fittings may be lined in accordance with AWWA C550. Lining shall be NSF 61 certified.

2.06 EXTERIOR COATING

- A. Buried pipe shall be installed with a bituminous coating in accordance with AWWA C151 and C110 respectively.
- B. Buried pipe shall be installed with double polyethylene encasement. Polyethylene encasement shall have a minimum thickness of 8 mils and meet or exceed the minimum standards established by AWWA C105, current edition. Acceptable manufacturers include Fulton or approved equal.
 1. Polyethylene encasement shall meet minimum size requirements per TABLE 3 of section 2.15 of DIPRA's Installation Guide For Ductile Iron Pipe.
 2. Test results from an independent testing agency certifying that the polyethylene encasement meets all criteria established by AWWA C105, current edition, shall be submitted to the LWC Project Manager via the KYTC Resident Engineer prior to approval of the polyethylene encasement for use. In general, samples shall be submitted and include test results in accordance with the AWWA standard associated with tensile strength, elongation, dielectric strength, impact resistance, and propagation tear resistance.
 3. A 2-inch wide plastic adhesive tape, such as Calpico Vinyl, Polyken 900, or approved equal, shall be used for sealing seams, cuts, or tears in polyethylene encasement. Duct tape shall not be allowed.

PART 3: EXECUTION

3.01 GENERAL

- A. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe, lining or coatings. Pipe and fittings shall not be dropped or skidded against each other. Slings, hooks or pipe tongs shall be used for pipe handling. All pipe and fittings shall be examined before laying and no piece shall be installed which is found to be defective. Any damage to the pipe, lining or coatings shall be repaired per manufacturer's recommendations. Handling and laying of pipe and fittings shall be in accordance with manufacturer's instruction and as specified herein.
- B. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work and when installed or laid, shall conform to the lines and grades required.
- C. Materials, if stored, shall be kept safe from damage. The interior of all pipes, fittings and other appurtenances shall be kept free from dirt, excessive corrosion or foreign matter at all times.
- D. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall conform to manufacturer's recommendations and/or AWWA C600.
- E. Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

3.02 INSTALLING DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe and fittings shall be installed in accordance with requirements of the laying schedule AWWA C600, except as otherwise specified herein. A firm, even bearing throughout the length of the pipe shall be provided by digging bell holes at each joint and by tamping backfill materials at the side of the pipe to the springline per details shown on the Drawings. Blocking will not be permitted. If any defective pipe or fitting is discovered after it has been laid, it shall be removed and replaced with a sound pipe or fitting in a satisfactory manner by the Contractor, at his/her own expense.
- B. All pipe and fittings shall be kept clean until they are used in the work and shall be sound and thoroughly cleaned before laying. When laid, the pipe and fittings shall perform to the lines and grades required. When laying is not in progress, including lunch breaks, open ends of the pipe shall be closed by a watertight plug or other approved means. Sufficient backfill shall be placed to prevent flotation. The deflection at joints shall not exceed that recommended by the manufacturer or 3 degrees whichever is less.
- C. All ductile iron pipe laid underground shall have a minimum of 4 feet of cover unless otherwise shown on the Drawings or as specified herein. Pipe shall be laid such that the invert elevations shown on the Drawings are not exceeded.

- D. Fittings, in addition to those shown on the Drawings shall be provided, where required, in crossing utilities which may be encountered upon opening the trench. Solid sleeve closures shall be installed at locations approved by the LWC Project Manager.
- E. The pipe interior shall be maintained dry and broom clean throughout the construction period.
- F. When field cutting the pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. The end of the cut pipe shall be beveled to conform to the manufacture's recommendations for the spigot end. Any coating removed from the cut end shall be repaired according to manufacturer's recommendation and/or Section 2.06 (whichever method is more stringent in the opinion of the LWC Project Manager). Cement lining shall be undamaged. Cutting of restrained joint pipe will not be allowed, unless approved at specific joints in conjunction with the use of restrainer glands by EBAA Iron or field adaptable restrained joints. Where field cuts are permitted, the pipe to be cut shall be supplied by the factory as "gauged full length". Should full length gauged pipe be unavailable, the pipe to be cut shall be field gauged at the location of the new spigot using a measuring tape, or other means approved by the manufacturer, to verify that the diameter is within the tolerances permitted in Table 1 of AWWA C151.
- G. The deflection of joints shall not exceed 75% of the maximum deflection recommended by the manufacturer.
- H. Jointing Ductile-Iron Pipe
 - 1. Push-on joints shall be made in strict accordance with manufacturer's instructions, AWWA C600 and Appendix B of AWWA C111. If there is conflict, the manufacturer's instructions shall take precedence. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe. The joint surfaces shall be cleaned and lubricated and the plain end of the pipe shall be aligned with the bell of the pipe to which it is to be joined and pushed home. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is properly seated. The surfaces with which the rubber gasket comes in contact shall be thoroughly cleaned just prior to assembly. The gasket shall then be inserted into the groove in the bell. Before starting joint assembly, a liberal coating of special lubricant shall be applied to the gasket and the spigot end. With the spigot end centered in the bell, the spigot end is pushed home.
 - 2. Mechanical joints shall be assembled in strict accordance with the manufacturer's instructions, AWWA C600 and Appendix A of AWWA C111. If there is conflict, the manufacturer's instructions shall take precedence. Pipe shall be laid with bell ends looking ahead. To assemble the joints in the field, thoroughly clean and lubricate the joint surfaces and rubber gasket. Bolts shall be tightened to the specified torques. Under no condition shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage. After installation, apply a bitumastic coating to bolts and nuts and install polyethylene encasement as specified.
 - 3. All components shall be cleaned and lubricated with soapy water prior to assembly. Slip the follower gland and gasket over the pipe plain end making sure the small side of the gasket and lip of the gland face the bell socket. Insert the plain end into socket. Push gasket into position with fingers, gasket should be evenly seated.
Slide gland into position, insert bolts and tighten by hand. Bolts are then tightened alternately (across from one another) to the following normal torques:

<u>Bolt Size</u>	<u>Torque Range (Foot-Pounds)</u>
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0.50"	40 - 60
0.75"	60 - 90
1"	70 - 100
1.25"	90 - 120

4. Bolts in mechanical or restrained joints shall be tightened alternately and evenly. Restraint for mechanical joint pipe shall use retainer glands for restraining joint. All restrained mechanical joints shall be suitable for the specified test pressure.
5. Restrained joints shall be installed according to pipe manufacturer's instructions.
6. Flanged joints shall be assembled in strict accordance with the manufacturer's instructions and Appendix C of AWWA C111. If there is conflict, the manufacturer's instructions shall take precedence. Extreme care shall be taken to ensure that there is no restraint on opposite ends of pipe or fitting, which would prevent uniform gasket compression, cause unnecessary stress, bending or torsional strains, or distortion of flanges or flanged fittings. Adjoining push on joints shall not be assembled until flanged joints have been tightened. Flange bolts shall be tightened uniformly to compress the gasket uniformly and obtain a seal. Flange bolts shall be left with approximately 1/2-inch projection beyond the face of the nut after tightening. After installation apply a bitumastic coating to the bolts and nuts as specified.
7. Sleeve couplings shall only be installed for closure or as shown on the Drawings. Couplings shall not be assembled until adjoining joints have been assembled. After installation. Apply a heavy bitumastic coating to the bolts and nuts and install protective wrap recommended by the manufacturer or as required herein. Care shall be exercised to insure that the insulating properties of insulating and dielectric couplings are maintained.
- I. All blowoffs, outlets, valves, fittings and other appurtenances required shall be set and jointed as indicated on the Drawings in accordance with manufacturer's instructions.
- J. Install double polyethylene encasement around ductile iron pipe in accordance with pipe manufacturer's recommendations.
 1. Polyethylene encasement shall be installed per ANSI/ AWWA C105/A21.5, Method 'A' in accordance with section 2.15 of DIPRA's Installation Guide For Ductile Iron Pipe.
 2. A fabric type or padded sling shall be used when handling polyethylene encased pipe to prevent damage to the polyethylene encasement.
 3. All seams in the polyethylene encasement shall be sealed completely with approved 2-inch wide plastic adhesive tape.
 4. Extreme care shall be taken to ensure that all rips or tears in the polyethylene encasement are properly repaired with additional tape and film as described in ANSI/AWWA C105/A21.5
 5. Extreme care shall be taken when backfilling to avoid damaging the polyethylene encasement
 6. 8 mil thick (linear low density polyethylene tube type)

7. Marking requirements for polywrap are as outlined in AWWA C105-05. Polywrap without correct markings will be rejected.
8. Polyethylene adhesive tape must be compatible with polyethylene wrap and must be not be less than 5 mil thick.
9. Polyethylene encasement shall be the COLOR BLUE. Other colors will be rejected.
10. Contractor shall provide certificate of compliance for Polywrap.

3.03 FILLING AND TESTING

- A. After installation, the pipe shall be tested for compliance as specified herein. Furnish all necessary equipment and labor for the hydrostatic pressure test on the pipelines.
- B. Submit detailed test procedures and method for LWC Project Manager's review via the KYTC Resident Engineer. In general, testing shall be conducted in accordance with AWWA C600. The method and procedures for performing the hydrostatic pressure test shall be approved by the LWC Project Manager. Submit the plan for testing to the LWC Project Manager via the KYTC Resident Engineer at least 10 days before starting a test. Refer to Section 01445.

3.04 CASING PIPE INSTALLATION

- A. The work to be performed under these specifications shall consist of furnishing and installing all materials and equipment and performing all labor required to install pipelines crossing under existing and proposed highways, railroads, and streets by boring, jacking, and tunneling, as specified herein. All bores will be accomplished by dry mechanical bore unless otherwise approved by the LWC Project Manager and the KYTC Resident Engineer. All carrier pipes within the encasement conduit shall be restrained joint pipe of the type specified on the plans, Louisville Water Company Specifications and/or approved by the LWC Project Manager and the KYTC Resident Engineer. The carrier pipe shall be centered and restrained within the casing pipe.

3.05 SUBMITTALS:

- A. The following items shall be submitted before delivery of casing pipe, spacers and end seals:
 1. Submit manufacturer's "Certificate of Compliance" for casing pipe materials furnished.
 2. Submit manufacturer's "Certificate of Compliance" for casing insulator and casing end seal materials furnished.
 3. Submit welders' American Welders Society Certification.

3.06 CASING PIPE MATERIAL

- A. The material shall conform to the chemical and mechanical requirements of the latest revision of ASTM A139 "Electric-Fusion (ARC) Welded Steel Pipe (NPS 4 and over), unless otherwise stated herein.
- B. The pipe furnished shall be grade B. The steel shall be new and previously unused.
- C. Hydrostatic testing shall not be necessary.
- D. Pipe ends shall be beveled at one end (for field welding of circumferential joints) and shall be plain right angle cut at the other end. All burrs at the end of the pipe shall be removed.

E. The wall thickness at any point shall be within 12.5% of the thickness specified in the following table:

<u>Outside Diameter</u>	<u>Nominal Metal Thickness</u>
42.00"	0.500"
30.00"	0.500"

F. Circumference – The outside circumference of the pipe shall not vary more than + or – 1%, but not exceeding + or – 3/4" from the nominal outside circumference.

G. Ovality (Out-of-Roundness) – The pipe diameter within 4.0 in. of ends, shall not vary more than 1% from the specified diameter.

H. Straightness – The pipe shall be straight to within 1/2 inch per length of pipe.

I. All ID obstructions (bead welds, slags, etc.) shall not extend more than 3/32" from the ID face.

J. Each length of pipe shall be legibly marked, stating: manufacturer, grade, diameter, wall thickness and primer.

K. A protective coating shall be applied to the inside and outside of each length of pipe. Following an SSPC SP-7 "Brush-Off Blast Cleaning" surface preparation, 3.0 dry mils of Tnemac Primar 100-99 (red), or of an approved equal, shall be applied in the manner recommended by the respective paint manufacturer.

3.07 QUALITY ASSURANCE

ALLOWABLE TOLERANCES

A. Where grades or elevations are shown on the plans for the pipeline to be installed by open trench, boring, jacking, and tunneling operations, maximum deviation of plan elevation shall be 0.1 foot. The maximum deviation of alignment over the length of the bore shall be 0.1 foot.

B. The Contractor shall have the line and grade of the casing pipe checked after each length of casing pipe is installed.

C. The LWC Project Manager shall determine the corrective action to be taken for tolerances above those stated in this specification.

3.08 JOINTS

A. Comply with American Welding Society (AWS) Code of Arc and Gas Welding in Building Construction. Fully weld all joints with full penetrating weld, including joints of casing pipes laid in open trench areas.

B. The inside welded joint shall be smooth, non-obstructing, and conform to all specifications as required by AWS. The casing pipe shall be installed without any vertical or horizontal bends.

3.09 CASING INSULATORS & END SEALS

SUBMITTALS

Shop drawings and manufacturer's literature for all CONTRACTOR supplied materials shall be promptly submitted to the LWC Project Manager via the KYTC Resident Engineer for approval.

CASING SPACER SUPPLIER

- A. Casing spacers and end seals shall be manufactured by an LWC Approved vendor
- B. Model CCS casing spacer and Model CCES end seals manufactured by Cascade Waterworks Manufacturing; Model SSI casing spacers and Model AC Pull-on end seals manufactured by Advances Products & Systems, Inc. or an approved may be utilized.
- C. It is the responsibility of the Contractor to ensure that the casing spacers are sized appropriately (by the manufacturer) for the carrier pipe.

3.10 MATERIAL SPECIFICATIONS

A. SHELL

- a. Minimum 14 gauge T 304 stainless steel.
- b. All surfaces are fully chemically passivated.

B. RISERS

Minimum 10 ga. T-304 stainless steel, reinforced 6' and over height.

C. FASTENERS

5/16-18" T 304 stainless steel

D. LINER

PVC .090 thick, 85-90 durometer
ASTM D1706-61T – 80
Max constant operating temperature - 150F (64C)
Electrical properties - (ASTM - D149-61)
1380 V/min.

E. RUNNERS

Ultra high molecular weight polymer
Low coefficient of friction
High resistance to abrasion and sliding wear
Toughness under impact
Low deflection under compression
Dielectric insulation

F. Casing End Seals

- 1. Casing ends are to be closed by installing "casing end seals". Casing end seals are made of a neoprene rubber with stainless steel bands used to secure the casing end seal to the casing pipe and the carrier pipe.

G. INSTALLATION

- 1. Casing spacers shall provide projections around the entire circumference of the carrier pipe.
- 2. The carrier pipe shall be centered and restrained within the casing pipe such that the height of the risers and runners are to center the carrier pipe in the casing pipe with a minimum top clearance of three-fourths inch minimum.
- 3. Casing spacers shall be in segments for field assembly, without the need for special tools.

4. Spacer segments shall be fastened securely around the carrier pipe and shall be secured by means other than adhesives.
5. Pipe shall not rest on bells.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and design, install and remove formwork for cast-in-place concrete as shown on the Drawings and as specified herein.
- B. Secure to forms as required or set for embedment as required, all miscellaneous metal items, sleeves, reglets, anchor bolts, inserts and other items furnished under other Sections and required to be cast into concrete.

1.02 RELATED WORK

- A. Concrete Reinforcement is included in Section 03200.
- B. Cast-in-Place Concrete is included in Section 03300.
- D. Grout is included in Section 03600.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Form release agent
 - 2. Form ties
 - 3. Form liners
 - 4. Location and sequence of the concrete placements. Indicate locations of form joints, panel sizes and patterns. Show location of form ties on architectural surfaces.
 - 5. Review of pour sequence, form system and panel layout shall be for appearance and strength of the completed structure only. Approval by the LWC Project Manager or by the KYTC Resident Engineer of forming plans or procedures shall not relieve the Contractor of responsibility for the strength, safety or correctness of methods used the adequacy of equipment, or from carrying out the work in full compliance with the requirements of the Drawings and as specified herein.
- B. Samples
 - 1. Demonstrate to the LWC Project Manager and the KYTC Resident Engineer on a designated area of the concrete substructure exterior surface that the form release agent will not adversely affect concrete surfaces to be painted, coated or otherwise finished and will not affect the forming materials.
- C. Certificates

1. Certify form release agent is suitable for use in contact with potable water after 30 days (non-toxic and free of taste and odor).
 2. Submit completed P.E. certification form for design of formwork in accordance with Section 01300.
- D. Review shall be for appearance and strength of the completed structure only. Approval by the LWC Project Manager or the KYTC Resident Engineer shall not relieve the Contractor of responsibility for the strength, safety or correctness of methods used the adequacy of equipment, or from carrying out the Work in full compliance with the requirements of the Drawings and Specifications.

1.04 REFERENCE STANDARDS

- A. American Concrete Institute (ACI)
1. ACI 301 - Standard Specification for Structural Concrete
 2. ACI 318 - Building Code Requirements for Reinforced Concrete
 3. ACI 347 - Formwork for Concrete
- B. American Plywood Association (APA)
1. Material grades and designations as specified
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. The form liner manufacturer's representative shall be on-site during the initial installation of the form liner to instruct the Contractor on the proper methods of application and use of the liner. He/She shall be available to answer any questions on the liner that the LWC Project Manager may have.

1.06 SYSTEM DESCRIPTION

- A. General: Architectural Concrete is wall, slab, beam or column concrete which will have surfaces exposed to view in the finished work. It includes similar exposed surfaces in water containment structures from the top of walls to 2-ft below the normal water surface in open tanks and basins.
- B. Structural design responsibility: All forms and shoring shall be designed at the Contractor's expense by a professional engineer registered in the Commonwealth of Kentucky. Formwork shall be designed and erected in accordance with the requirements of ACI 301 and ACI 318 and as recommended in ACI 347 and shall comply with all applicable regulations and codes. The design shall consider any special requirements due to the use of plasticized and/or retarded set concrete.

PART 2 PRODUCTS

2.01 GENERAL

- A. The usage of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configurations desired.

2.02 MATERIALS

- A. Forms for cast-in-place concrete shall be made of wood, metal, or other approved material. Wood forms for the project shall be new and unused. Construct wood forms of sound lumber or plywood of suitable dimensions and free from knotholes and loose knots. Where used for exposed surfaces, dress and match boards. Sand plywood smooth and fit adjacent panels with tight joints. Metal forms may be used when approved by the LWC Project Manager and shall be of an appropriate type for the class of work involved. All forms shall be designed and constructed to provide a flat, uniform concrete surface requiring minimal finishing or repairs.
- B. Wall Forms
 - 1. Forms for all exposed exterior and interior concrete walls shall be new and unused "Plyform" exterior grade plywood panels manufactured in compliance with the APA and bearing the trademark of that group, or equal acceptable to the LWC Project Manager and the KYTC Resident Engineer. Provide B grade or better veneer on all faces to be placed against concrete during forming. The class of material and grades of interior plies shall be of sufficient strength and stiffness to provide a flat, uniform concrete surface requiring minimal finishing and grinding.
 - 2. All joints or gaps in forms shall be taped, gasketed, plugged, and/or caulked with an approved material so that the joint will remain watertight and will withstand placing pressures without bulging outward or creating surface patterns.
 - 3. Forms for circular structures shall conform to the circular shape of the structure. Straight panels may be substituted for circular panels if the straight panels do not exceed 2-ft in width nor deflect more than 3½ degrees per joint, nor conflict with specific notes on the Drawings.
- C. Rustications shall be at the location and shall conform to the details shown on the Drawings. Moldings for chamfers and rustications shall be milled and planed smooth. Rustications and corner strips shall be of a nonabsorbent material, compatible with the form surface and fully sealed on all sides to prohibit the loss of paste or water between the two surfaces.
- D. Form Release Agent
 - 1. Coat all forming surfaces in contact with concrete using an effective, non-staining, non-residual, water based, bond-breaking form coating unless otherwise noted. Form release agents used in potable water containment structures shall be suitable for use in contact with potable water and shall be non-toxic and free of taste or odor.
- E. Concrete surfaces which are to be painted shall be formed with hard plastic finished plywood or a similar material which does not require a form release agent unless the Contractor can substantiate to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer that the form release agent will not remain on the formed surface after it is stripped.
- F. Form Ties

1. Form ties encased in concrete other than those specified in the following paragraphs shall be designed so that, after removal of the projecting part, no metal shall remain within 1½-in of the face of the concrete. The part of the tie to be removed shall be at least ½-in diameter or be provided with a wood or metal cone at least ½-in diameter and 1½-in long. Form ties in concrete exposed to view shall be the cone-washer type.
2. Form ties for exposed exterior and interior walls shall be as specified in the preceding paragraph except that the cones shall be of approved wood or plastic.
3. Flat bar ties for panel forms shall have plastic or rubber inserts having a minimum depth of 1½-in and sufficient dimensions to permit proper patching of the tie hole.
4. Ties for liquid containment structures shall have an integral waterstop that is tightly welded to the tie.
5. Common wire shall not be used for form ties.
6. Alternate form ties consisting of tapered through-bolts at least 1-in in diameter at smallest end or through-bolts that utilize a removable tapered sleeve of the same minimum size may be used at the Contractor's option. Obtain LWC Project Manager's acceptance of system and spacing of ties prior to ordering or purchase of forming. Clean, fill and seal form tie hole with non-shrink cement grout. The Contractor shall be responsible for watertightness of the form ties and any repairs needed.

PART 3 EXECUTIONS

3.01 GENERAL

- A. Forms shall be used for all cast-in-place concrete including sides of footings. Forms shall be constructed and placed so that the resulting concrete will be of the shape, lines, dimensions and appearance indicated on the Drawings.
- B. Forms for walls shall have removable panels at the bottom for cleaning, inspection and joint surface preparation. Forms for walls of considerable height shall have closable intermediate inspection ports. Tremies and hoppers for placing concrete shall be used to allow concrete inspection, prevent segregation and prevent the accumulation of hardened concrete on the forms above the fresh concrete.
- C. Molding, bevels, or other types of chamfer strips shall be placed to produce blockouts, rustications, or chamfers as shown on the Drawings or as specified herein. Chamfer strips shall be provided at horizontal and vertical projecting corners to produce a ¾-in chamfer. Rectangular or trapezoidal moldings shall be placed in locations requiring sealants where specified or shown on the Drawings. Sizes of moldings shall conform to the sealant manufacturer's recommendations.
- D. Forms shall be sufficiently rigid to withstand construction loads and vibration and to prevent displacement or sagging between supports. Construct forms so that the concrete will not be damaged by their removal. The Contractor shall be entirely responsible for the adequacy of the forming system.
- E. Before form material is re-used, all surfaces to be in contact with concrete shall be thoroughly cleaned, all damaged places repaired, all projecting nails withdrawn and all protrusions

smoothed. Reuse of wooden forms for other than rough finish will be permitted only if a "like new" condition of the form is maintained.

3.02 FORM TOLERANCES

- A. Forms shall be surfaced, designed and constructed in accordance with the recommendations of ACI 347 and shall meet the following additional requirements for the specified finishes.
- B. Formed Surface Exposed to View: Edges of all form panels in contact with concrete shall be flush within 1/32-in and forms for plane surfaces shall be such that the concrete will be plane within 1/16-in in 4-ft. Forms shall be tight to prevent the passage of mortar, water and grout. The maximum deviation of the finish wall surface at any point shall not exceed 1/4-in from the intended surface as shown on the Drawings. Form panels shall be arranged symmetrically and in an orderly manner to minimize the number of seams.
- C. Formed surfaces not exposed to view or buried shall meet requirements of Class "C" Surface in ACI 347.
- D. Formed rough surfaces including mass concrete, pipe encasement, electrical duct encasement and other similar installations shall have no minimum requirements for surface smoothness and surface deflections. The overall dimensions of the concrete shall be plus or minus 1-in.
- E. Formed concrete Surfaces to Receive Paint: Surface deflections shall be limited to 1/32-in at any point and the variation in wall deflection shall not exceed 1/16-in per 4-ft. The maximum deviation of the finish wall surface at any point shall not exceed 1/4-in from the intended surface as shown on the Drawings.

3.03 FORM PREPARATION

- A. Wood forms in contact with the concrete shall be coated with an effective release agent prior to form installation.
- B. Steel forms shall be thoroughly cleaned and mill scale and other ferrous deposits shall be sandblasted or otherwise removed from the contact surface for all forms, except those utilized for surfaces receiving a rough finish. All forms shall have the contact surfaces coated with a release agent.
- C. Form liners to be installed for architectural concrete finish shall be in accordance to the manufacturer recommendations.

3.04 REMOVAL OF FORMS

- A. The Contractor shall be responsible for all damage resulting from removal of forms. Forms and shoring for structural slabs or beams shall remain in place in accordance with ACI 301 and ACI 347. Form removal shall conform to the requirements specified in Section 03300.

3.05 INSPECTION

- A. The LWC Project Manager via the KYTC Resident Engineer shall be notified when the forms are complete and ready for inspection at least 6 hours prior to the proposed concrete placement.
- B. Failure of the forms to comply with the requirements specified herein or to produce concrete complying with requirements of this Section shall be grounds for rejection of that portion of the

concrete work. Rejected work shall be repaired or replaced as directed by the LWC Project Manager or the KYTC Resident Engineer at no additional cost to the Louisville Water Company. Such repair or replacement shall be subject to the requirements of this Section and approval of the LWC Project Manager and the KYTC Resident Engineer.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install all concrete reinforcement complete as shown on the Drawings and as specified herein.
- B. Furnish only all deformed steel reinforcement required to be entirely built into concrete masonry unit construction.

1.02 RELATED WORK

- A. Concrete Formwork is included in Section 03100.
- B. Cast-in-place Concrete is included in Section 03300.
- C. Grout is included in Section 03600.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Reinforcing steel. Placement drawings shall conform to the recommendations of ACI 315. All reinforcement in a concrete placement shall be included on a single placement drawing or cross-referenced to the pertinent main placement drawing. The main drawing shall include the additional reinforcement (around openings, at corners, etc) shown on the standard detail sheets. Bars to have special coatings and/or to be of special steel or special yield strength are to be clearly identified.
 - 2. Bar bending details. The bars shall be referenced to the same identification marks shown on the placement drawings. Bars to have special coatings and/or to be of special steel or special yield strength shall be clearly identified.
- B. Submit Test Reports, in accordance with Section 01300, of each of the following items.
 - 1. Certified copy of mill test on each steel proposed for use showing the physical properties of the steel and the chemical analysis.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A184 – Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
 - 2. ASTM A185 – Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement

3. ASTM A497 – Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
 4. ASTM A615 – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- B. American Concrete Institute (ACI)
1. ACI 301 – Standard Specification for Structural Concrete
 2. ACI 315 – Details and Detailing of Concrete Reinforcement.
 3. ACI 318 – Building Code Requirements for Structural Concrete
 4. ACI SP-66 – ACI Detailing Manual
- C. Concrete Reinforcing Steel Institute (CRSI)
1. Manual of Standard Practice
- D. American Welding Society (AWS)
1. AWS D1.4 – Structural Welding Code Reinforcing Steel
- E. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.
- 1.05 DELIVERY, HANDLING AND STORAGE
- A. Reinforcing steel shall be substantially free from mill scale, rust, dirt, grease, or other foreign matter.
 - B. Reinforcing steel shall be shipped and stored with bars of the same size and shape fastened in bundles with durable tags, marked in a legible manner with waterproof markings showing the same "mark" designations as those shown on the submitted Placing Drawings.
 - C. Reinforcing steel shall be stored off the ground, protected from moisture and kept free from dirt, oil, or other injurious contaminants.
 - D. Coated reinforcing steel shall be stored on padded wooden or steel cribbing. Coatings damaged by fabrication, handling or installation shall be repaired to conform to the applicable coating requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials shall be new, of domestic manufacture and shall comply with the following material specifications.
- B. Deformed Concrete Reinforcing Bars: ASTM A615, Grade 60 deformed bars.

- C. Welded Steel Wire Fabric: ASTM A185.
- D. Welded Deformed Steel Wire Fabric: ASTM A497.
- E. Reinforcing Steel Accessories
 - 1. Plastic Protected Bar Supports: CRSI Bar Support Specifications, Class 1 - Maximum Protection.
 - 2. Precast Concrete Block Bar Supports: CRSI Bar Support Specifications, Precast Blocks. Blocks shall have equal or greater strength than the surrounding concrete.
- F. Tie Wire
 - 1. Tie Wires for Reinforcement shall be 16-gauge or heavier, black annealed wire.

2.02 FABRICATION

- A. Fabrication of reinforcement shall be in compliance with the CRSI Manual of Standard Practice.
- B. Bars shall be cold bent. Bars shall not be straightened or rebent.
- C. Bars shall be bent around a revolving collar having a diameter of not less than that recommended by the ACI 318.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Surface condition, bending, spacing and tolerances of placement of reinforcement shall comply with the CRSI Manual of Standard Practice. The Contractor shall be solely responsible for providing an adequate number of bars and maintaining the spacing and clearances shown on the Drawings.
- B. Except as otherwise indicated on the Drawings, the minimum concrete cover of reinforcement shall be as follows:
 - 1. Concrete cast against and permanently exposed to earth: 3-in
 - 2. Concrete exposed to soil, water, sewage, sludge and/or weather: 2-in (including bottom cover of slabs over water or sewage)
 - 3. Concrete not exposed to soil, water, sewage, sludge and/or weather:
 - a. Slabs (top and bottom cover), walls, joists, shells and folded plate members - 1-in
 - b. Beams and columns (principal reinforcement, ties, spirals and stirrups) - 1½-in
- C. Reinforcement which will be exposed for a considerable length of time after being placed shall be coated with a heavy coat of neat cement slurry.
- D. No reinforcing steel bars shall be welded either during fabrication or erection unless specifically shown on the Drawings or specified herein, or unless prior written approval has been obtained

from the LWC Project Manager. All bars that have been welded, including tack welds, without such approval shall be immediately removed from the work. When welding of reinforcement is approved or called for, it shall comply with AWS D1.4.

- E. Reinforcing steel interfering with the location of other reinforcing steel, conduits or embedded items, may be moved within the specified tolerances or one bar diameter, whichever is greater. Greater displacement of bars to avoid interference, shall only be made with the approval of the LWC Project Manager and the KYTC Resident Engineer. Do not cut reinforcement to install inserts, conduits, mechanical openings or other items without the prior approval of the LWC Project Manager.
- F. Securely support and tie reinforcing steel to prevent movement during concrete placement. Secure dowels in place before placing concrete.
- G. Reinforcing steel bars shall not be field bent except where shown on the Drawings or specifically authorized in writing by the LWC Project Manager. If authorized, bars shall be cold-bent around the standard diameter spool specified in the CRSI. Do not heat bars. Closely inspect the reinforcing steel for breaks. If the reinforcing steel is damaged, replace, Cadweld or otherwise repair as directed by the LWC Project Manager. Do not bend reinforcement after it is embedded in concrete [unless specifically shown otherwise on the Drawings].

3.02 REINFORCEMENT AROUND OPENINGS

- A. Unless specific additional reinforcement around openings is shown on the Drawings, provide additional reinforcing steel on each side of the opening equivalent to one half of the cross-sectional area of the reinforcing steel interrupted by an opening. The bars shall have sufficient length to develop bond at each end beyond the opening or penetration.

3.03 SPLICING OF REINFORCEMENT

- A. Splices designated as compression splices on the Drawings, unless otherwise noted, shall be 30 bar diameters, but not less than 12-in. The lap splice length for column vertical bars shall be based on the bar size in the column above.
- B. Tension lap splices shall be provided at all laps in compliance with ACI 318. [Splices in adjacent bars shall be staggered]. Class A splices may be used when 50 percent or less of the bars are spliced within the required lap length. Class B splices shall be used at all other locations.
- C. Except as otherwise indicated on the Drawings, splices in circumferential reinforcement in circular walls shall be Class B tension splices and shall be staggered. Adjacent bars shall not be spliced within the required lap length.
- D. Install wire fabric in as long lengths as practicable. Wire fabric from rolls shall be rolled flat and firmly held in place. Splices in welded wire fabric shall be lapped in accordance with the requirements of ACI-318 but not less than 12-in. The spliced fabrics shall be tied together with wire ties spaced not more than 24-in on center and laced with wire of the same diameter as the welded wire fabric. Do not position laps midway between supporting beams, or directly over beams of continuous structures. Offset splices in adjacent widths to prevent continuous splices.

3.04 ACCESSORIES

- A. Determine, provide and install accessories such as chairs, chair bars and the like in sufficient quantities and strength to adequately support the reinforcement and prevent its displacement during the erection of the reinforcement and the placement of concrete.
- B. Use precast concrete blocks where the reinforcing steel is to be supported over soil.
- C. Alternate methods of supporting top steel in slabs, such as steel channels supported on the bottom steel or vertical reinforcing steel fastened to the bottom and top mats, may be used if approved by the LWC Project Manager.

3.05 INSPECTION

- A. In no case shall any reinforcing steel be covered with concrete until the installation of the reinforcement, including the size, spacing and position of the reinforcement has been observed by the LWC Project Manager and the KYTC Resident Engineer and the LWC Project Manager's release to proceed with the concreting has been obtained. The LWC Project Manager and the KYTC Resident Engineer shall be given ample prior notice of the readiness of placed reinforcement for observation. The forms shall be kept open until the LWC Project Manager and the KYTC Resident Engineer has finished his/her observations of the reinforcing steel.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor and materials required and install cast-in-place concrete complete as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Concrete Formwork is included in Section 03100.
- B. Concrete Reinforcement is included in Section 03200.
- C. Concrete Finishes are included in Section 03350.
- D. Grout is included in Section 03600.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data including the following:
 - 1. Sources of cement and aggregates.
 - 2. Air-entraining admixture. Product data including catalogue cut, technical data, storage requirements, product life, recommended dosage, temperature considerations and conformity to ASTM standards.
 - 3. Water-reducing admixture. Product data including catalogue cut, technical data, storage requirements, product life, recommended dosage, temperature considerations and conformity to ASTM standards.
 - 4. Sheet curing material. Product data including catalogue cut, technical data and conformity to ASTM standard.
- B. Samples
 - 1. Fine and coarse aggregates if requested by the LWC Project Manager.
- C. Test Reports
 - 1. Sieve analysis, mechanical properties and deleterious substance content for coarse and fine aggregate.
 - 2. Chemical analysis and physical tests of cement.

3. Concrete mix for each formulation of concrete proposed for use including constituent quantities per cubic yard, water cementitious ratio, concrete slump, type and manufacturer of cement.
 - a. Standard deviation data for each proposed concrete mix based on statistical records.
 - b. Water cementitious ratio curve for concrete mixes based on laboratory tests. Give average cylinder strength test results at 7 and 28 days for laboratory concrete mix designs. Provide results of 14 day tests if available.

D. Certifications

1. Certify that admixtures used in the same concrete mix are compatible with each other and the aggregates.
2. Certify that the Contractor is not associated with the independent testing laboratory proposed to be used by him/her nor does the Contractor or his/her officers have a beneficial interest in the laboratory.

E. Qualifications

1. Independent testing laboratory: Name, address and qualifications of laboratory proposed to be used by the Contractor. Laboratories affiliated with the Contractor or in which the Contractor or his/her officers have a beneficial interest are not acceptable.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
2. ASTM C33 – Standard Specification for Concrete Aggregates.
3. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
5. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
6. ASTM C143 – Standard Test Method for Slump of Hydraulic Cement Concrete
7. ASTM C150 – Standard Specification for Portland Cement.
8. ASTM C171 – Standard Specification for Sheet Materials for Curing Concrete.
9. ASTM C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

11. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.

B. American Concrete Institute (ACI).

1. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
2. ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
3. ACI 304.2R – Placing Concrete by Pumping Methods.
4. ACI 305R – Hot Weather Concreting.
5. ACI 306R – Cold Weather Concreting.
6. ACI 318 – Building Code Requirements for Reinforced Concrete.
7. ACI 350R – Environmental Engineering Concrete Structures.

C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. Reinforced concrete shall comply with ACI 318, the recommendations of ACI 350R and other stated requirements, codes and standards. The most stringent requirement of the codes, standards and this Section shall apply when conflicts exist.
- B. Only one source of cement and aggregates shall be used on any one structure. Concrete shall be uniform in color and appearance.
- C. Well in advance of placing concrete, discuss with the LWC Project Manager and the KYTC Resident Engineer the sources of individual materials and batched concrete proposed for use. Discuss placement methods, waterstops and curing. Propose methods of hot and cold weather concreting as required.
- D. If, during the progress of the work, it is impossible to secure concrete of the required workability and strength with the materials being furnished, the LWC Project Manager or the KYTC Resident Engineer may order such changes in proportions or materials, or both, as may be necessary to secure the desired properties. All changes so ordered shall be made at the Contractor's expense.
- E. If, during the progress of the work, the materials from the sources originally accepted change in characteristics, the Contractor shall, at his/her expense, make new acceptance tests of aggregates and establish new design mixes. Such testing and design shall be accomplished with the assistance of an Independent Testing Laboratory acceptable to the LWC Project Manager and the KYTC Resident Engineer.
- F. Testing of the following materials shall be furnished by Contractor to verify conformity with this Specification Section and the stated ASTM Standards.

1. Fine aggregates for conformity with ASTM C33 – sieve analysis, physical properties, and deleterious substances.
 2. Coarse aggregates for conformity with ASTM C33 – sieve analysis, physical properties, and deleterious substances.
 3. Cements for conformity with ASTM C150 – chemical analysis and physical properties.
 4. Pozzolans for conformity with ASTM C618 – chemical analysis and physical properties.
 5. Proposed concrete mix designs – compressive strength, slump, and air content.
- G. Field testing and inspection services will be provided by the Contractor. The cost of such work, except as specifically stated otherwise, shall be paid by the Contractor. Testing of the following items shall be by the Owner to verify conformity with this Specification Section.
1. Concrete placements – compressive strength (cylinders), compressive strength (cores), slump, and air content.
 2. Other materials or products that may come under question.
- H. All materials incorporated in the work shall conform to accepted samples.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Cement: Store in weathertight buildings, bins or silos to provide protection from dampness and contamination and to minimize warehouse set.
- B. Aggregate: Arrange and use stockpiles to avoid excessive segregation or contamination with other materials or with other sizes of like aggregates. Build stockpiles in successive horizontal layers not exceeding 3-ft in thickness. Complete each layer before the next is started. Do not use frozen or partially frozen aggregate.
- C. Sand: Arrange and use stockpiles to avoid contamination. Allow sand to drain to a uniform moisture content before using. Do not use frozen or partially frozen aggregates.
- D. Admixtures: Store in closed containers to avoid contamination, evaporation or damage. Provide suitable agitating equipment to assure uniform dispersion of ingredients in admixture solutions which tend to separate. Protect liquid admixtures from freezing and other temperature changes which could adversely affect their characteristics.
- E. Sheet Curing Materials: Store in weathertight buildings or off the ground and under cover.

PART 2 PRODUCTS

2.01 GENERAL

- A. The use of manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- B. Like items of materials shall be the end products of one manufacturer in order to provide standardization for appearance, maintenance and manufacturer's service.

2.02 MATERIALS

- A. Materials shall comply with this Section and any applicable State or local requirements.
- B. Cement: Domestic Portland cement complying with ASTM C150. Air entraining cements shall not be used. Cement brand shall be subject to approval by the LWC Project Manager and one brand shall be used throughout the Work. The following cement type(s) shall be used:
- C. Fine Aggregate: Washed inert natural sand conforming to the requirements of ASTM C33.
- D. Coarse Aggregate: Well-graded crushed stone or washed gravel conforming to the requirements of ASTM C33. Grading requirements shall be as listed in ASTM C33 Table 2 for the specified coarse aggregate size number. Limits of Deleterious Substances and Physical Property Requirements shall be as listed in ASTM C33 Table 3 for severe weathering regions. Size numbers for the concrete mixes shall be as shown in Table 1 herein.
- E. Water: Potable water free from injurious amounts of oils, acids, alkalis, salts, organic matter, or other deleterious substances.
- F. Admixtures: Admixtures shall be free of chlorides and alkalis (except for those attributable to water). When it is required to use more than one admixture in a concrete mix, the admixtures shall be from the same manufacturer. Admixtures shall be compatible with the concrete mix including other admixtures and shall be suitable for use in contact with potable water after 30 days of concrete curing.
 - 1. Air-Entraining Admixture: The admixture shall comply with ASTM C260. Proportioning and mixing shall be in accordance with manufacturer's recommendations.
 - 2. Water-Reducing Agent: The admixture shall comply with ASTM C494, Type A. Proportioning and mixing shall be in accordance with manufacturer's recommendations.
 - 3. Admixtures causing retarded or accelerated setting of concrete shall not be used without written approval from the LWC Project Manager. When allowed, the admixtures shall be retarding or accelerating water reducing or high range water reducing admixtures.
- G. Sheet Curing Materials. Waterproof paper, polyethylene film or white burlap-polyethylene sheeting all complying with ASTM C171.

2.03 MIXES

- A. Development of mix designs and testing shall be by an independent testing laboratory acceptable to the LWC Project Manager engaged by and at the expense of the Contractor.
- B. Select proportions of ingredients to meet the design strength and materials limits specified in Table 1 and to produce concrete having proper placability, durability, strength, appearance and other required properties. Proportion ingredients to produce a homogenous mixture which will readily work into corners and angles of forms and around reinforcement without permitting materials to segregate or allowing excessive free water to collect on the surface.
- C. The design mix shall be based on standard deviation data of prior mixes with essentially the same proportions of the same constituents or, if such data is not available, be developed by a testing laboratory, acceptable to the LWC Project Manager and the KYTC Resident Engineer,

engaged by and at the expense of the Contractor. Acceptance of mixes based on standard deviation shall be based on the modification factors for standard deviation tests contained in ACI 318. The water content of the concrete mix, determined by laboratory testing, shall be based on a curve showing the relation between water cementitious ratio and 7 and 28 day compressive strengths of concrete made using the proposed materials. The curves shall be determined by four or more points, each representing an average value of at least three test specimens at each age. The curves shall have a range of values sufficient to yield the desired data, including the specified design strengths as modified below, without extrapolation. The water content of the concrete mixes to be used, as determined from the curve, shall correspond to strengths 16 percent greater than the specified design strengths. The resulting mix shall not conflict with the limiting values for maximum water cementitious ratio and net minimum cementitious content as specified in Table 1.

- D. Compression Tests: Provide testing of the proposed concrete mix or mixes to demonstrate compliance with the specified design strength requirements in conformity with the above paragraph.
- E. Entrained air, as measured by ASTM C231, shall be as shown in Table 1.
 - 1. If the air-entraining agent proposed for use in the mix requires testing methods other than ASTM C231 to accurately determine air content, make special note of this requirement in the admixture submittal required under Paragraph 1.03.
- F. Slump of the concrete as measured by ASTM C143, shall be as shown in Table 1.
- G. Proportion admixtures according to the manufacturer's recommendations. Two or more admixtures specified may be used in the same mix provided that the admixtures in combination retain full efficiency and have no deleterious effect on the concrete or on the properties of each other.

TABLE 1

CONCRETE MIX REQUIREMENTS

Class	Design Strength (1)	Cement (2)	Fine Aggregate (2)	Coarse Aggregate (3)	Cementitious Content (4)
A	2500	C150 Type II	C33	57	440 min.
B	5000	C150 Type I/II	C33	67	564 min.
C	4000	C150 Type II	C33	67	590 min.

Class	W/C Ratio (5)	Fly Ash	AE Range (6)	WR (7)	Slump Range Inches
A	0.62 max.	--	3.5 to 5	Yes	1-4
B	0.42 max.	--	4 to 6	Yes	4
C	0.44 max.	--	3.5 to 5	Yes	3-5

NOTES:

- (1) Minimum compressive strength in psi at 28 days
- (2) ASTM designation
- (3) Size Number in ASTM C33
- (4) Cementitious content in lbs/cu yd
- (5) W/C is Water-Cementitious ratio by weight
- (6) AE is percent air-entrainment
- (7) WR is water-reducer admixture

PART 3 EXECUTIONS

3.01 MEASURING MATERIALS

- A. Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, water and admixtures as specified and shall be produced by a plant acceptable to the LWC Project Manager and the KYTC Resident Engineer. All constituents, including admixtures, shall be batched at the plant.
- B. Measure materials for batching concrete by weighing in conformity with and within the tolerances given in ASTM C94 except as otherwise specified. Scales shall have been certified by the local Sealer of Weights and Measures within 1 year of use.
- C. Measure the amount of free water in fine aggregates within 0.3 percent with a moisture meter. Compensate for varying moisture contents of fine aggregates. Record the number of gallons of water as-batched on printed batching tickets.
- D. Admixtures shall be dispensed either manually using calibrated containers or measuring tanks, or by means of an automatic dispenser approved by the manufacturer of the specific admixture.
 - 1. Charge air-entraining and chemical admixtures into the mixer as a solution using an automatic dispenser or similar metering device.
 - 2. Inject multiple admixtures separately during the batching sequence.

3.02 MIXING AND TRANSPORTING

- A. Concrete shall be ready-mixed concrete produced by equipment acceptable to the LWC Project Manager and the KYTC Resident Engineer. No hand-mixing will be permitted. Clean each transit mix truck drum and reverse drum rotation before the truck proceeds under the batching plant. Equip each transit-mix truck with a continuous, nonreversible, revolution counter showing the number of revolutions at mixing speeds.
- B. Ready-mix concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of their rated capacities as stated on the name plate.
- C. Keep the water tank valve on each transit truck locked at all times. Any addition of water must be directed by the LWC Project Manager. Added water shall be incorporated by additional mixing of at least 35 revolutions. All added water shall be metered and the amount of water added shall be shown on each delivery ticket.
- D. All central plant and rolling stock equipment and methods shall comply with ACI 318 and ASTM C94.
- E. Select equipment of size and design to ensure continuous flow of concrete at the delivery end. Metal or metal-lined non-aluminum discharge chutes shall be used and shall have slopes not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20-ft long and chutes not meeting slope requirements may be used if concrete is discharged into a hopper before distribution.
- F. Retempering (mixing with or without additional cement, aggregate, or water) of concrete or mortar which has reached initial set will not be permitted.

- G. Handle concrete from mixer to placement as quickly as practicable while providing concrete of required quality in the placement area. Dispatch trucks from the batching plant so they arrive at the work site just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.
- H. Furnish a delivery ticket for ready mixed concrete to the LWC Project Manager or the KYTC representative as each truck arrives. Each ticket shall provide a printed record of the weight of cement and each aggregate as batched individually. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Clearly indicate the weight of fine and coarse aggregate, cement and water in each batch, the quantity delivered, the time any water is added, and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of the truck mixer.
- I. Temperature and Mixing Time Control
 - 1. In cold weather, do not allow the as-mixed temperature of the concrete and concrete temperatures at the time of placement in the forms to drop below 40 degrees F.
 - 2. If water or aggregate has been heated, combine water with aggregate in the mixer before cement is added. Do not add cement to mixtures of water and aggregate when the temperature of the mixture is greater than 90 degrees F.
 - 3. In hot weather, cool ingredients before mixing to maintain temperature of the concrete below the maximum placing temperature of 90 degrees F. If necessary, substitute well-crushed ice for all or part of the mixing water.
 - 4. The maximum time interval between the addition of mixing water and/or cement to the batch and the placing of concrete in the forms shall not exceed the values shown in Table 2.

TABLE 2

MAXIMUM TIME TO DISCHARGE OF CONCRETE

<u>Air or Concrete Temperature (whichever is higher)</u>	<u>Maximum Time</u>
80 to 90 Degree F (27 to 32 Degree C).....	45 minutes
70 to 79 Degree F (21 to 26 Degree C).....	60 minutes
40 to 69 Degree F (5 to 20 Degree C).....	90 minutes

If an approved high-range water-reducer (plasticizer) is used to produce plasticized concrete, the maximum time interval shall not exceed 90 minutes.

3.03 CONCRETE APPEARANCE

- A. Concrete mix showing either poor cohesion or poor coating of the coarse aggregate with paste shall be remixed. If this does not correct the condition, the concrete shall be rejected. If the slump is within the allowable limit, but excessive bleeding, poor workability, or poor finishability are observed, changes in the concrete mix shall be obtained only by adjusting one or more of the following:
 - 1. The gradation of aggregate.
 - 2. The proportion of fine and coarse aggregate.
 - 3. The percentage of entrained air, within the allowable limits.
- B. Concrete for the work shall provide a homogeneous structure which, when hardened, will have the required strength, durability and appearance. Mixtures and workmanship shall be such that concrete surfaces, when exposed, will require no finishing. When concrete surfaces are stripped, the concrete, when viewed in good lighting from 10-ft away, shall be pleasing in appearance, and at 20-ft shall show no visible defects.

3.04 PLACING AND COMPACTING

- A. Placing
 - 1. Verify that all formwork completely encloses concrete to be placed and is securely braced prior to concrete placement. Remove ice, excess water, dirt and other foreign materials from forms. Confirm that reinforcement and other embedded items are securely in place. Have a competent workman at the location of the placement who can assure that reinforcing steel and embedded items remain in designated locations while concrete is being placed. Sprinkle semi-porous subgrades or forms to eliminate suction of water from the mix. Seal extremely porous subgrades in an approved manner.
 - 2. Deposit concrete as near its final position as possible to avoid segregation due to rehandling or flowing. Place concrete continuously at a rate which ensures the concrete is being integrated with fresh plastic concrete. Do not deposit concrete which has partially hardened or has been contaminated by foreign materials or on concrete which has hardened sufficiently to cause formation of seams or planes of weakness within the section. If the section cannot be placed continuously, place construction joints as specified or as approved.
 - 3. Pumping of concrete will be permitted. Use a mix design and aggregate sizes suitable for pumping and submit for approval.
 - 4. Remove temporary spreaders from forms when the spreader is no longer useful. Temporary spreaders may remain embedded in concrete only when made of galvanized metal or concrete and if prior approval has been obtained.
 - 5. Do not place concrete for supported elements until concrete previously placed in the supporting element (columns, slabs and/or walls) has reached adequate strength.
 - 6. Where surface mortar is to form the base of a finish, especially surfaces designated to be painted, work coarse aggregate back from forms with a suitable tool to bring the full surface of the mortar against the form. Prevent the formation of excessive surface voids.

7. Slabs

- a. After suitable bulkheads, screeds and jointing materials have been positioned, the concrete shall be placed continuously between construction joints beginning at a bulkhead, edge form, or corner. Each batch shall be placed into the edge of the previously placed concrete to avoid stone pockets and segregation.
- b. Avoid delays in casting. If there is a delay in casting, the concrete placed after the delay shall be thoroughly spaded and consolidated at the edge of that previously placed to avoid cold joints. Concrete shall then be brought to correct level and struck off with a straightedge. Bullfloats or darbies shall be used to smooth the surface, leaving it free of humps or hollows.
- c. Where slabs are to be placed integrally with the walls below them, place the walls and compact as specified. Allow 1 hour to pass between placement of the wall and the overlying slab to permit consolidation of the wall concrete. Keep the top surface of the wall moist so as to prevent cold joints.

8. Formed Concrete

- a. Place concrete in forms using tremie tubes and taking care to prevent segregation. Bottom of tremie tubes shall preferably be in contact with the concrete already placed. Do not permit concrete to drop freely more than 4-ft. Place concrete for walls in 12 to 24-in lifts, keeping the surface horizontal. If plasticized concrete is used, the maximum lift thickness may be increased to 7-ft and the maximum free fall of concrete shall not exceed 15-ft.

B. Compacting

1. Consolidate concrete by vibration, puddling, spading, rodding or forking so that concrete is thoroughly worked around reinforcement, embedded items and openings and into corners of forms. Puddling, spading, etc, shall be continuously performed along with vibration of the placement to eliminate air or stone pockets which may cause honeycombing, pitting or planes of weakness.
2. All concrete shall be placed and compacted with mechanical vibrators. The number, type and size of the units shall be approved by the LWC Project Manager in advance of placing operations. No concrete shall be ordered until sufficient approved vibrators (including standby units in working order) are on the job.
3. A minimum frequency of 5000 rpm is required for mechanical vibrators. Insert vibrators and withdraw at points from 18 to 30-in apart. At each insertion, vibrate sufficiently to consolidate concrete, generally from 5 to 15 seconds. Do not over vibrate so as to segregate. Keep a spare vibrator on the site during concrete placing operations.
4. Concrete Slabs: Concrete for slabs less than 8-in thick shall be consolidated with vibrating screeds; slabs 8 to 12-in thick shall be compacted with internal vibrators and (optionally) with vibrating screeds. Vibrators shall always be placed into concrete vertically and shall not be laid horizontally or laid over.
5. Walls and Columns: Internal vibrators (rather than form vibrators) shall be used unless otherwise approved by the LWC Project Manager. In general, for each vibrator needed to

melt down the batch at the point of discharge, one or more additional vibrators must be used to densify, homogenize and perfect the surface. The vibrators shall be inserted vertically at regular intervals, through the fresh concrete and slightly into the previous lift, if any.

6. Amount of Vibration: Vibrators are to be used to consolidate properly placed concrete but shall not be used to move or transport concrete in the forms. Vibration shall continue until:
 - a. Frequency returns to normal.
 - b. Surface appears liquefied, flattened and glistening.
 - c. Trapped air ceases to rise.
 - d. Coarse aggregate has blended into surface, but has not disappeared.

3.05 CURING AND PROTECTION

A. Protect all concrete work against injury from the elements and defacements of any nature during construction operations.

B. Curing Methods

1. Curing Methods for Concrete Surfaces: Cure concrete to retain moisture and maintain specified temperature at the surface for a minimum of 7 days after placement. Curing methods to be used are as follows:
 - a. Water Curing: Keep entire concrete surface wet by ponding, continuous sprinkling or covered with saturated burlap. Begin wet cure as soon as concrete attains an initial set and maintain wet cure 24 hours a day.
 - b. Sheet Material Curing: Cover entire surface with sheet material. Securely anchor sheeting to prevent wind and air from lifting the sheeting or entrapping air under the sheet. Place and secure sheet as soon as initial concrete set occurs.
 - c. Liquid Membrane Curing: Apply over the entire concrete surface except for surfaces to receive additional concrete. Curing compound shall NOT be placed on any concrete surface where additional concrete is to be placed, where concrete sealers or surface coatings are to be used, or where the concrete finish requires an integral floor product. Curing compound shall be applied as soon as the free water on the surface has disappeared and no water sheen is visible, but not after the concrete is dry or when the curing compound can be absorbed into the concrete. Application shall be in compliance with the manufacturer's recommendations.
2. Specified applications of curing methods.
 - a. Slabs for Water Containment Structures: Water curing only.
 - b. Structural Slabs (other than water containment): Water curing or liquid membrane curing.
 - c. Formed Surfaces: None if nonabsorbent forms are left in place 7 days. Water cure if absorbent forms are used. Sheet cured or liquid membrane cured if forms are removed

prior to 7 days. Exposed horizontal surfaces of formed walls or columns shall be water cured for 7 days or until next placement of concrete is made.

- d. Concrete Joints: Water cured or sheet material cured.
- C. Finished surfaces and slabs shall be protected from the direct rays of the sun to prevent checking and crazing.
- D. Cold Weather Concreting:
1. "Cold weather" is defined as a period when for more than 3 successive days, the average daily outdoor temperature drops below 40 degrees F. The average daily temperature shall be calculated as the average of the highest and the lowest temperature during the period from midnight to midnight.
 2. Cold weather concreting shall conform to ACI 306.1 and the additional requirements specified herein. Temperatures at the concrete placement shall be recorded at 12-hour intervals (minimum).
 3. Discuss a cold weather work plan with the LWC Project Manager. The discussion shall encompass the methods and procedures proposed for use during cold weather including the production, transportation, placement, protection, curing and temperature monitoring of the concrete. The procedures to be implemented upon abrupt changes in weather conditions or equipment failures shall also be discussed. Cold weather concreting shall not begin until the work plan is acceptable to the LWC Project Manager.
 4. During periods of cold weather, concrete shall be protected to provide continuous warm, moist curing (with supplementary heat when required) for a total of at least 350 degree-days of curing.
 - a. Degree-days are defined as the total number of 24 hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (eg: 5 days at an average 70 degrees F = 350 degree-days).
 - b. To calculate the weighted average daily air temperature, sum hourly measurements of the air temperature in the shade at the surface of the concrete taking any measurement less than 50 degrees F as 0 degrees F. Divide the sum thus calculated by 24 to obtain the weighted average temperature for that day.
 5. Salt, manure or other chemicals shall not be used for protection.
 6. The protection period for concrete being water cured shall not be terminated during cold weather until at least 24 hours after water curing has been terminated.
- E. Hot Weather Concreting
1. "Hot weather" is defined as any combination of high air temperatures, low relative humidity and wind velocity which produces a rate of evaporation estimated in accordance with ACI 305R, approaching or exceeding 0.2 lbs/sqft/hr).
 2. Concrete placed during hot weather, shall be batched, delivered, placed, cured and protected in compliance with the recommendations of ACI 305R and the additional requirements specified herein.

- a. Temperature of concrete being placed shall not exceed 90 degrees F and every effort shall be made to maintain a uniform concrete mix temperature below this level. The temperature of the concrete shall be such that it will cause no difficulties from loss of slump, flash set or cold joints.
 - b. All necessary precautions shall be taken to promptly deliver, to promptly place the concrete upon its arrival at the job and to provide vibration immediately after placement.
 - c. The LWC Project Manager or the KYTC Representative may direct the Contractor to immediately cover plastic concrete with sheet material.
3. Discuss with the LWC Project Manager and the KYTC Resident Engineer a work plan describing the methods and procedures proposed to use for concrete placement and curing during hot weather periods. Hot weather concreting shall not begin until the work plan is acceptable to the LWC Project Manager.

3.06 REMOVAL OF FORMS

- A. Except as otherwise specifically authorized by the LWC Project Manager and the KYTC Resident Engineer, forms shall not be removed before the concrete has attained a strength of at least 30 percent of its specified design strength, nor before reaching the following number of day-degrees of curing (whichever is the longer):

TABLE 3

MINIMUM TIME TO FORM REMOVAL

<u>Forms for</u>	<u>Degree Days</u>
Beams and slabs	500
Walls and vertical surfaces	100

(See definition of degree-days in Paragraph 3.05D above).

- B. Shores shall not be removed until the concrete has attained at least 60 percent of its specified design strength and also sufficient strength to support safely its own weight and construction live loads.

3.07 INSPECTION AND FIELD TESTING

- A. The batching, mixing, transporting, placing and curing of concrete shall be subject to the inspection of the LWC Project Manager and the KYTC Representative at all times. The Contractor shall advise the LWC Project Manager and the KYTC Resident Engineer of his/her readiness to proceed at least 24 hours prior to each concrete placement. The LWC Project Manager will inspect the preparations for concreting including the preparation of previously placed concrete, the reinforcing steel and the alignment, cleanliness and tightness of formwork. No placement shall be made without the inspection and acceptance of the LWC Project Manager.
- B. Sets of field control cylinder specimens will be taken by the Testing Laboratory Inspector during the progress of the work, in compliance with ASTM C31. The number of sets of

concrete test cylinders taken of each class of concrete placed each day shall not be less than one set per day, nor less than one set for each 150 cu yds. of concrete nor less than one set for each 5,000 sq ft of surface area for slabs or walls.

1. A "set" of test cylinders consists of four cylinders: one to be tested at 7 days and two to be tested and their strengths averaged at 28 days. The fourth may be used for a special test at 3 days or to verify strength after 28 days if 28-day test results are low.
 2. When the average 28 day compressive strength of the cylinders in any set falls below the specified design strength or below proportional minimum 7 day strengths (where proper relation between seven and 28 day strengths have been established by tests), proportions, water content, or temperature conditions shall be changed to achieve the required strengths.
- C. Cooperate in the making of tests by allowing free access to the work for the selection of samples, providing an insulated closed curing box for specimens, affording protection to the specimens against injury or loss through the operations and furnish material and labor required for the purpose of taking concrete cylinder samples. All shipping of specimens will be paid for by the Contractor. Curing boxes shall be acceptable to the LWC Project Manager and the KYTC Resident Engineer.
- D. Slump tests will be made in the field immediately prior to placing the concrete. Such tests shall be made in accordance with ASTM C143. If the slump is greater the specified range, the concrete shall be rejected.
- E. Air Content: Test for air content shall be made on a fresh concrete samples. Air content for concrete made of ordinary aggregates having low absorption shall be made in compliance with either the pressure method complying with ASTM C231 or by the volumetric method complying with ASTM C173. If lightweight aggregates or aggregates with high absorptions are used, the latter test method shall be used.
- F. The LWC Project Manager or the KYTC Resident Engineer may have cores taken from any questionable area in the concrete work such as construction joints and other locations as required for determination of concrete quality. The results of tests on such cores shall be the basis for acceptance, rejection or determining the continuation of concrete work.
- G. Cooperate in obtaining cores by allowing free access to the work and permitting the use of ladders, scaffolding and such incidental equipment as may be required. Repair all core holes. The work of cutting and testing the cores will be at the expense of the Owner.

3.08 FIELD CONTROL

- A. The LWC Project Manager or the KYTC Resident Engineer may have cores taken from any questionable area in the concrete work such as construction joints and other locations as required for determination of concrete quality. The results of tests on such cores shall be the basis for acceptance, rejection or determining the continuation of concrete work.
- B. The Contractor shall cooperate in obtaining cores by allowing free access to the Work and permitting the use of ladders, scaffolding and such incidental equipment as may be required. The Contractor shall repair all core holes. The work of cutting and testing the cores will be at the expense of the Owner.

3.09 FAILURE TO MEET REQUIREMENTS

- A. Should the strengths shown by the test specimens made and tested in compliance with the previous provisions fall below the values given in Table 1, the LWC Project Manager and the KYTC Resident Engineer shall have the right to require changes in proportions outlined to apply to the remainder of the work. Furthermore, the LWC Project Manager and the KYTC Resident Engineer shall have the right to require additional curing on those portions of the structure represented by the test specimens which failed. The cost of such additional curing shall be at the Contractor's expense. In the event that such additional curing does not give the strength required, as evidenced by core and/or load tests, the LWC Project Manager and the KYTC Resident Engineer shall have the right to require strengthening or replacement of those portions of the structure which fail to develop the required strength. The cost of all such core borings and/or load tests and any strengthening or concrete replacement required because strengths of test specimens are below that specified, shall be entirely at the expense of the Contractor. In such cases of failure to meet strength requirements the Contractor and LWC Project Manager and the KYTC Resident Engineer shall confer to determine what adjustment, if any, can be made in compliance with Sections titled "Strength" and "Failure to Meet Strength Requirements" of ASTM C94. The "purchaser" referred to in ASTM C94 is the Contractor in this Section.
- B. When the tests on control specimens of concrete fall below the specified strength, the LWC Project Manager and the KYTC Resident Engineer will permit check tests for strengths to be made by means of typical cores drilled from the structure in compliance with ASTM C42 and C39. In the case of cores not indicating adequate strength, the LWC Project Manager and the KYTC Resident Engineer, in addition to other recourses, may require, at the Contractor's expense, load tests on any one of the slabs, beams, piles, caps, and columns in which such concrete was used. Tests need not be made until concrete has aged 60 days.
- C. Should the strength of test cylinders fall below 60 percent of the required minimum 28 day strength, the concrete shall be rejected and shall be removed and replaced.

3.10 PATCHING AND REPAIRS

- A. It is the intent of this Section to require quality work including adequate forming, proper mixture and placement of concrete and curing so completed concrete surfaces will require no patching.
- B. As soon as the forms have been stripped and the concrete surfaces exposed, fins and other projections shall be removed; recesses left by the removal of form ties shall be filled; and surface defects which do not impair structural strength shall be repaired. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete, to approval of the LWC Project Manager.
- C. Immediately after removal of forms remove plugs and break off metal ties as required by Section 03100. Promptly fill holes upon stripping as follows: Moisten the hole with water, followed by a 1/16-in brush coat of neat cement slurry mixed to the consistency of a heavy paste. Immediately plug the hole with a 1 to 1.5 mixture of cement and concrete sand mixed slightly damp to the touch (just short of "balling"). Hammer the grout into the hole until dense, and an excess of paste appears on the surface in the form of a spiderweb. Trowel smooth with heavy pressure. Avoid burnishing.
- D. When patching exposed surfaces the same source of cement and sand as used in the parent concrete shall be employed. Adjust color if necessary by addition of proper amounts of white cement. Rub lightly with a fine Carborundum stone at an age of 1 to 5 days if necessary to bring the surface down with the parent concrete. Exercise care to avoid damaging or staining

the virgin skin of the surrounding parent concrete. Wash thoroughly to remove all rubbed matter.

3.11 SCHEDULE

- A. The following (Table 4) are the general applications for the various concrete classes and design strengths:

TABLE 4
CONCRETE SCHEDULE

<u>Class</u>	<u>Design Strength (psi)</u>	<u>Description</u>
A	2,500	Sidewalks
B	5,000	Walls, slabs on grade, suspended slab and beam systems, columns, grade beams and all other structural concrete
C	4,000	Walls, slabs on grade, suspended slab and beam systems, columns, grade beams, concrete encasement, thrust blocks and all other structural concrete

END OF SECTION

SECTION 03350

CONCRETE FINISHES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and finish cast-in-place concrete surfaces as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Concrete Formwork is included in Section 03100.
- B. Cast-In-Place Concrete is included in Section 03300.
- C. Grout is included in Section 03600.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Concrete sealer. Confirmation that the sealer is compatible with additionally applied coatings shall also be submitted.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C33 - Standard Specification for Concrete Aggregates.
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

- A. Finishes
 - 1. For concrete which will receive additional applied finishes or materials, the surface finish specified is required for the proper application of the specified manufacturer's products. Where alternate products are approved for use, determine if changes in finishes are required and provide the proper finishes to receive these products.
 - 2. Changes in finishes made to accommodate products different from those specified shall be performed at no additional cost to the Louisville Water Company or KYTC. Submit the proposed new finishes and their construction methods to the LWC Project Manager via the KYTC Resident Engineer for approval.
- B. Services of Manufacturer's Representative

1. Make available at no extra cost to the Louisville Water Company or KYTC, upon 72 hours notification, the services of a qualified field representative of the manufacturer of curing compound, sealer or hardener to instruct the user on the proper application of the product under prevailing job conditions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Chemical hardener shall be Lapidolith by Sonneborn; Hornolith by A.C. Horn; Penalith by W.R. Meadows or equal fluosilicate base material.

PART 3 EXECUTION

3.01 FORMED SURFACES

- A. Forms shall not be removed before the requirements of Section 03300, have been satisfied.
- B. Exercise care to prevent damaging edges or obliterating the lines of chamfers, rustications or corners when removing the forms or performing any other work adjacent thereto.
- C. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete.
- D. Rough-Form Finish
 1. Immediately after stripping forms and before concrete has changed color, carefully remove all fins and projections.
 2. Promptly fill holes left by tie cones and defects as specified in Section 03300.
- E. Rubbed Finish
 1. Immediately upon stripping forms and before concrete has changed color, carefully remove all fins. While the wall is still damp apply a thin coat of medium consistency neat cement slurry by means of bristle brushes to provide a bonding coat within all pits, air holes or blemishes in the parent concrete. Avoid coating large areas with the slurry at one time.
 2. Before the slurry has dried or changed color, apply a dry (almost crumbly) grout proportioned by volume and consisting of 1 part cement to 1½ parts of clean masonry sand having a fineness modulus of approximately 2.3 and complying with the gradation requirements of ASTM C33 for such a material. Grout shall be uniformly applied by means of damp pads of coarse burlap approximately 6-in square used as a float. Scrub grout into the pits and air holes to provide a dense mortar in all imperfections.
 3. Allow the mortar to partially harden for 1 or 2 hours depending upon the weather. If the air is hot and dry, keep the wall damp during this period using a fine, fog spray. When the grout has hardened sufficiently so it can be scraped from the surface with the edge of a steel trowel without damaging the grout in the small pits or holes, cut off all that can be removed with a trowel. (Note: Grout allowed to remain on the wall too long will harden and will be difficult to remove.)
 4. Allow the surface to dry thoroughly and rub it vigorously with clean dry burlap to completely remove any dried grout. No visible film of grout shall remain after this rubbing. The entire cleaning operation for any area must be completed the day it is started.

Do not leave grout on surfaces overnight. Allow sufficient time for grout to dry after it has been cutoff with the trowel so it can be wiped off clean with the burlap.

5. On the day following the repair of pits, air holes and blemishes, the walls shall again be wiped off clean with dry, used pieces of burlap containing old hardened mortar which will act as a mild abrasive. After this treatment, there shall be no built-up film remaining on the parent surface. If, however, such a film is present, a fine abrasive stone shall be used to remove all such material without breaking through the surface film of the original concrete. Such scrubbing shall be light and sufficient only to remove excess material without changing the texture of the concrete.
6. A thorough wash-down with stiff bristle brushes shall follow the final bagging or stoning operation. No extraneous materials shall remain on the surface of the wall. The wall shall be sprayed with a fine fog spray periodically to maintain a continually damp condition for at least 3 days after the application of the repair grout.

3.02 FLOORS AND SLABS

A. Floated Finish

1. Machine Floating

- a. Screed floors and slabs with straightedges to the established grades shown on the Drawings. Immediately after final screeding, a dry cement/sand shake in the proportion of two sacks of Portland cement to 350 lbs. of coarse natural concrete sand shall be sprinkled evenly over the surface at the rate of approximately 500 lbs. /1,000 sq ft of floor. Do not sprinkle neat, dry cement on the surface.
- b. The application of the cement/sand shake may be eliminated at the discretion of the LWC Project Manager and the KYTC Resident Engineer if the base slab concrete exhibits adequate fattiness and homogeneity and the need is not indicated. When the concrete has hardened sufficiently to support the weight of a power float without its digging into or disrupting the level surface, thoroughly float the shake into the surface with a heavy revolving disc type power compacting machine capable of providing a 200 lb. compaction force distributed over a 24-in diameter disc.
- c. Start floating along walls and then move systematically across the surface leaving a matte finish.
- d. The compacting machine shall be the "Kelly Power Float with Compaction Control" as manufactured by Kelley Industries of SSP Construction Equipment Inc., Pomona, CA or equal. Troweling machines equipped with float (shoe) blades that are slipped over the trowel blades may be used for floating. Floating with a troweling machine equipped with normal trowel blades will not be permitted. The use of any floating or troweling machine which has a water attachment for wetting the concrete surface during finishing will not be permitted.

2. Hand Floating

- a. In lieu of power floating, small areas may be compacted by hand floating. The dry cement/sand shake previously specified shall be used unless specifically eliminated by the LWC Project Manager or the KYTC Resident Engineer. Screed the floors and slabs with straightedges to the established grades shown on the Drawings. While the concrete is still green, but sufficiently hardened to support a finisher and kneeboards

with no more than 1/4-in indentation, wood float to a true, even plane with no coarse aggregate visible. Use sufficient pressure on the wood floats to bring moisture to the surface.

3. Finishing Tolerances

- a. Level floors and slabs to a tolerance of plus or minus 1/8-in when checked with a 10-ft straightedge placed anywhere on the slab in any direction. Where drains occur, pitch floors to drains such that there are no low spots left undrained. Failure to meet either of the above requirements shall be cause for removal, grinding, or other correction as directed by the LWC Project Manager.

B. Broom Finish

1. Screed slabs with straightedges to the established grades indicated on the Drawings. When the concrete has stiffened sufficiently to maintain small surface indentations, draw a stiff bristle broom lightly across the surface in the direction of drainage, or, in the case of walks and stairs, perpendicular to the direction of traffic to provide a non-slip surface.

C. Steel Trowel Finish

1. Finish concrete as specified in Paragraph 3.04. Then, hand steel trowel to a perfectly smooth hard even finish free from high or low spots or other defects.

3.03 CONCRETE RECEIVING CHEMICAL HARDENER

- A. After 28 days, minimum, concrete cure, apply chemical hardener in three applications to a minimum total coverage of the undiluted chemical of 100 sq ft per gallon and in accordance with manufacturer's recommendations as reviewed.

3.04 APPROVAL OF FINISHES

- A. All concrete surfaces, when finished, will be inspected by the LWC Project Manager and the KYTC Representative.
- B. Surfaces which, in the opinion of the LWC Project Manager or the KYTC Resident Engineer, are unsatisfactory shall be refinished or reworked.
- C. After finishing horizontal surfaces, regardless of the finishing procedure specified, the concrete shall be cured in compliance with Section 03300 unless otherwise directed by the LWC Project Manager.

3.05 SCHEDULE OF FINISHES

- A. Concrete shall be finished as specified either to remain as natural concrete to receive an additional applied finish or material under another section.
- B. Concrete for the following conditions shall be finished as noted on the Drawings and as further specified herein:
 1. Concrete to Receive Dampproofing: Rough-form finish. See Paragraph 3.01D above.
 2. Concrete Not Exposed to View and Not Scheduled to Receive an Additional Applied Finish or Material: Rough-form finish. See Paragraph 3.01D above.

3. Exterior Vertical Concrete Above Grade Exposed to View: Rubbed finish. See Paragraph 3.01E above.
4. Vertical Concrete in Water Containment Areas. Rubbed finish on exposed surfaces and extending to two feet below normal operating water level: Rough-form finish on remainder of submerged areas. See Paragraphs 3.01E and 3.01D above.
5. Concrete for Exterior Walks, Interior and Exterior Stairs: Broomed finish perpendicular to direction of traffic. See Paragraph 3.02B above.

END OF SECTION

SECTION 03600

GROUT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install grout complete as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Formwork is included in Section 03100.
- B. Concrete Reinforcement is included in Section 03200.
- C. Cast-in-Place Concrete is included in Section 03300.

1.03 SUBMITTALS

- A. Submit to the LWC Project Manager via the KYTC Resident Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
 - 1. Commercially manufactured nonshrink cementitious grout. The submittal shall include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to required ASTM standards and Material Safety Data Sheet.
 - 2. Commercially manufactured nonshrink epoxy grout. The submittal shall include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to required ASTM standards and Material Safety Data Sheet.
 - 3. Concrete grout. The submittal shall include data as required for concrete as delineated in Section 03300 and for fiber reinforcement as delineated in Section 03200. This includes the mix design, constituent quantities per cubic yard and the water/cement ratio.
- B. Samples
 - 1. Samples of commercially manufactured grout products when requested by the LWC Project Manager or the KYTC Resident Engineer.
 - 2. Aggregates for use in concrete grout when requested by the LWC Project Manager or the KYTC Resident Engineer.
- C. Laboratory Test Reports
 - 1. Submit laboratory test data as required under Section 03300 for concrete to be used as concrete grout.
- D. Certifications

1. Certify that commercially manufactured grout products and concrete grout admixtures are suitable for use in contact with potable water after 30 days curing.
2. Certify that the Contractor is not associated with the independent testing laboratory, nor does the Contractor or its officers have a beneficial interest in the laboratory.

E. Qualifications

1. Grout manufacturers shall submit documentation that they have at least 10 years experience in the production and use of the proposed grouts which they will supply.
2. Submit the name, address and qualifications of the independent testing laboratory.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C33 – Standard Specification for Concrete Aggregates
2. ASTM C150 – Standard Specification for Portland Cement
3. ASTM C827 – Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
4. ASTM C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

B. U.S. Army Corps of Engineers Standard (CRD)

1. CRD C-621 – Corps of Engineers Specification for Nonshrink Grout

1.05 QUALITY ASSURANCE

A. Qualifications

1. Grout manufacturer shall have a minimum of 10 years experience in the production and use of the type of grout proposed for the work.

B. Pre-installation Conference

1. Well in advance of grouting, hold a pre-installation meeting to review the requirements for surface preparation, mixing, placing and curing procedures for each product proposed for use. Parties concerned with grouting shall be notified of the meeting at least 10 days prior to its scheduled date.

C. Services of Manufacturer's Representative

1. A qualified field technician of the nonshrink grout manufacturer, specifically trained in the installation of the products, shall attend the pre-installation conference and shall be present for the initial installation of each type of nonshrink grout. Additional services shall also be provided, as required, to correct installation problems.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the jobsite in original, unopened packages, clearly labeled with the manufacturer's name, product identification, batch numbers and printed instructions.
- B. Store materials in full compliance with the manufacturer's recommendations. Total storage time from date of manufacture to date of installation shall be limited to 6 months or the manufacturer's recommended storage time, whichever is less.
- C. Material which becomes damp or otherwise unacceptable shall be immediately removed from the site and replaced with acceptable material at no additional expense to the Owner.
- D. Nonshrink cement-based grouts shall be delivered as preblended, prepackaged mixes requiring only the addition of water.
- E. Nonshrink epoxy grouts shall be delivered as premeasured, prepackaged, three component systems requiring only blending as directed by the manufacturer.

1.07 DEFINITIONS

- A. Nonshrink Grout: A commercially manufactured product that does not shrink in either the plastic or hardened state, is dimensionally stable in the hardened state and bonds to a clean base plate.

PART 2 PRODUCTS

2.01 GENERAL

- A. The use of a manufacturer's name and product or catalog number is for the purpose of establishing the standard of quality desired.
- B. Like materials shall be the products of one manufacturer or supplier in order to provide standardization of appearance.

2.02 MATERIALS

- A. Nonshrink Cementitious Grout
 - 1. Nonshrink cementitious grouts shall meet or exceed the requirements of ASTM C1107, Grades B or C and CRD C-621. Grouts shall be Portland cement based, contain a pre-proportioned blend of selected aggregates and shrinkage compensating agents and shall require only the addition of water. Nonshrink cementitious grouts shall not contain expansive cement or metallic particles. The grouts shall exhibit no shrinkage when tested in conformity with ASTM C827.
 - a. General purpose nonshrink cementitious grout shall conform to the standards stated above and shall be SikaGrout 212 by Sika Corp.; Set Grout by Master Builders, Inc.; Gilco Construction Grout by Gifford Hill & Co.; Euco NS by The Euclid Chemical Co.; NBEC Grout by U. S. Grout Corp. or equal.

- b. Flowable (Precision) nonshrink cementitious grout shall conform to the standards stated above and shall be Masterflow 928 by Master Builders, Inc.; Hi-Flow Grout by the Euclid Chemical Co.; SikaGrout 212 by Sika Corp.; Supreme Grout by Gifford Hill & Co.; Five Star Grout by U. S. Grout Corp. or equal.

B. Concrete Grout

1. Concrete grout shall conform to the requirements of Section 03300 except as specified herein. It shall be proportioned with cement, coarse and fine aggregates, water, water reducer and air entraining agent to produce a mix having an average strength of 2900 psi at 28 days, or 2500 psi nominal strength. Coarse aggregate size shall be 3/8-in maximum. Slump should not exceed 5-in and should be as low as practical yet still retain sufficient workability.

C. Water

1. Potable water, free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.

PART 3 EXECUTION

3.01 PREPARATION

- A. Grout shall be placed over cured concrete that has attained its full design strength unless otherwise approved by the LWC Project Manager or the KYTC Resident Engineer.
- B. Concrete surfaces to receive grout shall be clean and sound; free of ice, frost, dirt, grease, oil, curing compounds, laitance and paints and free of all loose material or foreign matter which may affect the bond or performance of the grout.
- C. Roughen concrete surfaces by chipping, sandblasting, or other mechanical means to ensure bond of the grout to the concrete. Remove loose or broken concrete. Irregular voids or projecting coarse aggregate need not be removed if they are sound, free of laitance and firmly embedded into the parent concrete.
 1. Air compressors used to clean surfaces in contact with grout shall be the oilless type or equipped with an oil trap in the airline to prevent oil from being blown onto the surface.
- D. Remove all loose rust, oil or other deleterious substances from metal embedments or bottom of baseplates prior to the installation of the grout.
- E. Concrete surfaces shall be washed clean and then kept moist for at least 24 hours prior to the placement of cementitious or cement grout. Saturation may be achieved by covering the concrete with saturated burlap bags, use of a soaker hose, flooding the surface, or other method acceptable to the LWC Project Manager and the KYTC Resident Engineer. Upon completion of the 24-hour period, visible water shall be removed from the surface prior to grouting. The use of an adhesive bonding agent in lieu of surface saturation shall only be used when approved by the LWC Project Manager and the KYTC Resident Engineer for each specific location of grout installation.
- F. Construct grout forms or other leakproof containment as required. Forms shall be lined or coated with release agents recommended by the grout manufacturer. Forms shall be of adequate

strength, securely anchored in place and shored to resist the forces imposed by the grout and its placement.

- G. Level and align the structural or equipment bearing plates in accordance with the structural requirements and the recommendations of the equipment manufacturer.
- H. Equipment shall be supported during alignment and installation of grout by shims, wedges, blocks or other approved means. The shims, wedges and blocking devices shall be prevented from bonding to the grout by appropriate bond breaking coatings and removed after grouting unless otherwise approved by the LWC Project Manager and the KYTC Resident Engineer.

3.02 INSTALLATION – GENERAL

- A. Mix, apply and cure products in strict compliance with the manufacturer's recommendations and this Section.
- B. Have sufficient manpower and equipment available for rapid and continuous mixing and placing. Keep all necessary tools and materials ready and close at hand.
- C. Maintain temperatures of the foundation plate, supporting concrete, and grout between 40 and 90 degrees F during grouting and for at least 24 hours thereafter or as recommended by the grout manufacturer, whichever is longer. Take precautions to minimize differential heating or cooling of baseplates and grout during the curing period.
- D. Take special precautions for hot weather or cold weather grouting as recommended by the manufacturer when ambient temperatures and/or the temperature of the materials in contact with the grout are outside of the 60 and 90 degrees F range.
- E. Install grout in a manner which will preserve the isolation between the elements on either side of the joint where grout is placed in the vicinity of an expansion or control joint.
- F. Reflect all existing underlying expansion, control and construction joints through the grout.

3.03 INSTALLATION – NONSHRINK CEMENTITIOUS GROUTS

- A. Mix in accordance with manufacturer's recommendations. Do not add cement, sand, pea gravel or admixtures without prior approval by the LWC Project Manager or the KYTC Resident Engineer.
- B. Avoid mixing by hand. Mixing in a mortar mixer (with moving blades) is recommended. Pre-wet the mixer and empty excess water. Add premeasured amount of water for mixing, followed by the grout. Begin with the minimum amount of water recommended by the manufacturer and then add the minimum additional water required to obtain workability. Do not exceed the manufacturer's maximum recommended water content.
- C. Placements greater than 3-in in depth shall include the addition of clean, washed pea gravel to the grout mix when approved by the manufacturer. Comply with the manufacturer's recommendations for the size and amount of aggregate to be added.
- D. Provide forms where and as required. Place grout into the designated areas in a manner which will avoid segregation or entrapment of air. Do not vibrate grout to release air or to consolidate the material. Placement should proceed in a manner which will ensure the filling of all spaces

and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.

- E. Place grout rapidly and continuously to avoid cold joints. Do not place cement grouts in layers. Do not add additional water to the mix (retemper) after initial stiffening.
- F. Just before the grout reaches its final set, cut back the grout to the substrate at a 45 degree angle from the lower edge of bearing plate unless otherwise approved by the LWC Project Manager or the KYTC Resident Engineer. Finish this surface with a wood float or brush finish.
- G. Begin curing immediately after form removal, cutback, and finishing. Keep grout moist and within its recommended placement temperature range for at least 24 hours after placement or longer if recommended by the manufacturer. Saturate the grout surface by use of wet burlap, soaker hoses, ponding or other approved means. Provide sunshades as necessary. If drying winds inhibit the ability of a given curing method to keep grout moist, erect wind breaks until wind is no longer a problem or curing is finished.

3.04 INSTALLATION – CONCRETE GROUT

- A. Screed underlying concrete to the grade shown on the Drawings. Provide the surface with a broomed finish, aligned to drain. Protect and keep the surface clean until placement of concrete grout.
- B. Remove the debris and clean the surface by sweeping and vacuuming of all dirt and other foreign materials. Wash the tank slab using a strong jet of water. Flushing of debris into tank drain lines will not be permitted.
- C. Saturate the concrete surface for at least 24 hours prior to placement of the concrete grout. Saturation may be maintained by ponding, by the use of soaker hoses, or by other methods acceptable to the LWC Project Manager or the KYTC Resident Engineer. Remove excess water just prior to placement of the concrete grout. Place a cement slurry immediately ahead of the concrete grout so that the slurry is moist when the grout is placed. Work the slurry over the surface with a broom until it is coated with approximately 1/16 to 1/8-in thick cement paste.
- D. Place concrete grout to final grade using the scraper mechanism as a guide for surface elevation and to ensure high and low spots are eliminated. Unless specifically approved by the equipment manufacturer, mechanical scraper mechanisms shall not be used as a finishing machine or screed.
- E. Finish shall be steel trowel as specified in Section 03350 and as approved. Cure the concrete grout as specified for cast-in-place concrete.

3.05 SCHEDULE

- A. The following list indicates where the particular types of grout are to be used:
 - 1. General purpose nonshrink cementitious grout: Use at all locations where non-shrink grout is called for on the plans except for base plates greater in area than 3-ft wide by 3-ft long and except for the setting of anchor rods, anchor bolts or reinforcing steel in concrete.
 - 2. Flowable nonshrink cementitious grout: Use under all base plates greater in area than 3-ft by 3-ft. Use at all locations indicated to receive flowable nonshrink grout by the Drawings.

The Contractor, at his/her option and convenience, may also substitute flowable nonshrink grout for general-purpose nonshrink cementitious grout.

END OF SECTION

SECTION 15100

VALVES AND APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all gate valves and appurtenances as shown on the Project Drawings and as specified herein. Supplier shall design, manufacture, shop test, and deliver all valves and accessories, including actuators in strict accordance with American Water Works Association (AWWA) Standard C515-09, AWWA Standard For Resilient Seated Gate Valves
- B. The equipment shall include but is not limited to the following:
 - 1. Gate Valves
 - 2. Air Release/Vacuum Valves

1.02 RELATED WORK

- A. Piping is included in Division 2.

1.03 DESCRIPTION OF SYSTEMS

- A. All of the equipment and materials specified herein is intended to be standard for use in controlling the flow of wastewater, sludges, water, air, or chemicals, depending on the applications.

1.04 QUALIFICATIONS

- A. The gate valves shall be Iron body, Resilient Seat Gate Valve as manufactured by United States Pipe and Foundry Company, of Birmingham, Alabama; or American Flow Control Series 2500, or an approved equal. For proposed equals, the CONTRACTOR shall submit manufacturer's information and specifications to the LWC Project Manager via the KYTC Resident Engineer, no later than 5 working days before the scheduled bid opening, for PRE-APPROVAL as an equal. All valves and appurtenances shall be of the size shown on the Project Drawings and as far as possible all equipment of the same type shall be from one manufacturer. All valves and appurtenances shall have the name of the maker, flow-directional arrows, and the working pressure for which they are designed cast in raised letters on some appropriate part of the body.

1.05 SUBMITTALS

- A. Complete Shop Drawings of all valves and appurtenances shall be submitted to the LWC Project Manager via the KYTC Resident Engineer for approval in accordance with the requirements of Section 01300.

1.06 OPERATING INSTRUCTIONS

- A. Manufacturer's operating and maintenance instructions in ten (10) sets shall be furnished to the LWC Project Manager via the KYTC Resident Engineer for equipment furnished under this Section and shall be in accordance with Section 01300.

- B. The valve manufacturer shall supply and integrally mount all valve operators at the factory. The valve and operators shall be shipped as a unit.
- C. All valves shall open clockwise (to the right).
- D. Valve operator shall be provided with enclosed bevel gearing to reduce the torque required to operate the valve. The maximum required input torque to the actuator shall not exceed 125 foot-pounds, and shall meet AWWA Class 150B maximum operating torque for the respective valve. The actuators shall be full gasket, suitably seal, grease-packed for life, and designed to withstand submersion in water to 10 psi.
- E. The actuator shall be fitted with a 2-inch AWWA valve-operating nut, cast iron.
- F. The number of turns shall not be less 3 times the valve diameter (inches) or more than 4 times the valve diameter to open or close the valve.

1.07 TOOLS

- A. Special tools, if required for normal operation and maintenance shall be supplied with the equipment.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General

- 1. All valves and appurtenances shall be of the size shown on the Drawings and as far as possible all equipment of the same type shall be from one manufacturer.
- 2. All valves and appurtenances shall have the name of the manufacturer, flow direction arrows, and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.
- 3. Except as otherwise shown on the Drawings or specified herein, all valves with operators located 6 feet or more above the operating floor shall be provided with chain wheel operators complete with chain guides and galvanized steel chain.
- 4. All valves shall open Right (clockwise).

2.02 PRODUCTS

A. Gate Valves

- 1. General Requirements.
 - a. Unless otherwise specified below, these requirements shall apply to all gate valves.
 - b. Gate valves shall meet the requirements of AWWA C500 and AWWA C515-09 as applicable to the type of valve specified.
 - c. Buried and submerged valves shall be furnished with mechanical joints and stainless steel hardware; non-rising stem design.

- d. Exposed valves shall be furnished with Class 250 flanged ends; provide valves with outside screw and yoke. Exposed valves 16-inch and larger shall be furnished with a valve bypass.
- e. The valve body, bonnet and gate castings shall be constructed of ductile iron, and shall have full shell thickness according to AWWA C515-09, table 2, section 4.4.
- f. Rising stem valves shall be sealed with adjustable and replaceable packing; valve design must permit packing replacement under operating system pressures with only moderate leakage.
- g. Non-rising stem valves shall use a double O-ring stem seal, except that packing shall be used where geared operators are required.
- h. Except as otherwise specified, valves shall be rated for the following working water pressures:

Valve Size Pressure (psig)	
3-inch to 48-inch	250

All valve bodies shall be hydrostatically tested to at least twice the rated working water pressure. In addition, valves shall be seat-tested, bi-directional at the rated working pressure, with a bubble tight seal. Provide certificates of testing.

- i. Flanged valves to have face-to-face dimensions per ANSI C115.
- j. All bonnet and packing gland bolts shall be zinc or cadmium electroplated steel; packing gland bolts shall have bronze nuts.
- k. All valves shall be marked per AWWA Standards, including name of manufacturer, valve size and working pressure and year of manufacture.
- l. Valve operation shall be counterclockwise for potable water, clockwise other non-potable waters. Provide permanent label showing "OPEN" and arrows.
- m. Resilient-seated gate valves shall conform in all respects to ANSI/AWWA C515-09 with non-rising stems, fully bronze mounted with O-ring seals. Valves shall be of standard manufacture and of the highest quality both as to materials and workmanship and shall conform to the latest revisions of AWWA Specification C-500. Valves shall have a rated working pressure of 250 psi, and test pressure of 500 psi and shall be opened by turning clockwise only.
- n. Shall be designed for buried service where groundwater may completely submerge the valve and actuator. Gate valves shall be furnished with mechanical joint end connections with stainless steel hardware T-316, unless otherwise shown on the plans or specified herein. The end connections shall be suitable to receive ductile iron pipe. All gate valves shall be mechanically restrained to pipe utilizing a positive mechanical restraint such as American's Coupling Gland Ends, or equal, employing stainless steel 316 bolts and nuts. No friction type restraint such as Megalugs will be acceptable.
- o. Shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working pressure cast on the body of the valve. The valve body shall be ductile iron

- p. Shall be installed in a horizontal stem position, with actuator located in a manhole vault. (At the time of shop drawing review, the LWC Project Manager will advise which side of the valve the actuator will be located.)
- q. Subjected to a non-shock shutoff pressure of as much as 150 psi in the event of an emergency closure.
- r. Shall be used for potable water service with a temperature range of 34 degrees F to 85 degrees F and a pH range of 8.0 to 8.5

2. Valve Applications

- a. Valves for Potable Water Service.
- b. Gate Valves shall be resilient seated Metroseal manufactured by U.S. Pipe, or equal.

3. Valve Requirements

- a. Resilient Seated
 - Conform to AWWA C515-09.
 - Internal and external epoxy of valve body, including bonnet, per AWWA C550.
 - Gate shall be encapsulated with synthetic rubber. It shall be bonded and vulcanized in accordance with ASTM B429 Method B.
 - No recesses in valve body.
 - Valves shall be installed in the vertical position.

4. Buried Valves

- a. Conform to the requirements above, except mechanical joint bell ends per AWWA C111. All exposed valve hardware (nuts, bolts, washers, etc.) including bonnet, bonnet cover, stuffing box, gear adaptor and joints shall be Type 316 stainless steel.
- b. Non-rising stem design, double O-ring seals for non-g geared valves and shall incorporate packing for geared valves.
- c. Provide valve box, 2-inch operating nut and extension stem and stem cover, and tee handled valve wrenches.

B. Air Release and Vacuum Valves

- 1. Air release and vacuum valves shall be of the size indicated on the Drawings and designed to control the flow of large air volumes both into and out of the pipelines to which they are connected. Valves shall be tight against leakage under a working pressure of 200 psi and shop tested at a pressure of 300 psi.
- 2. The air release vacuum valve shall be comprised of a small orifice assembly and large orifice assembly housed in a single body. The large orifice assembly shall exhaust air from a pipeline during the initial filling of the pipeline. The large orifice assembly shall not blow shut while exhausting air, even while venting air at sonic velocity. When all air has been exhausted from the pipeline, the large orifice float ball shall be buoyed up to seat tightly against a resilient seat ring. The large orifice float ball shall remain tightly closed while the pipeline is under positive pressure. Should the pipeline pressure fall below atmospheric pressure, the large orifice float ball shall fall away from the seat ring and permit air to enter the pipeline.

The small orifice assembly shall automatically release air accumulations from the pipeline while under positive pressure. When the valve body fills with air, the small orifice float ball falls to open the small orifice and exhaust the air to atmosphere. When the air has been exhausted, the small orifice float shall be buoyed up and tightly close the small orifice. There shall be no baffles, deflectors, or stems.

In addition, each valve shall be furnished with a flanged gate valve for isolation purposes.

3. The valve body and covers shall be of ASTM A126, Class B cast iron construction. Large and small orifice float balls shall be 302 stainless steel, ASTM A240. The float arm, leverage arm and link shall be 304 stainless steel. The pivot pin shall be 18-8 stainless steel.
4. The air release vacuum valves shall be installed in the manner and at the locations as shown on the Drawings. Valves shall be Golden Anderson air and vacuum valve Figure 960 or equal, 2-inch.

C. Self-Centering Alignment Ring

1. All buried valve boxes shall have a two-piece AFC Centering Ring that centers the valve box directly over the valve and aligns the box in a vertical position. The centering ring shall have an adjustable detented slide to compensate for multiple stem diameters. The installation of the alignment ring below the operating nut shall not disturb the function of the nut nor shall the operating nut have to be removed to install the centering ring.

PART 3: EXECUTION

3.01 INSTALLATION

- A All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer before they are installed.
- B After installation, all valves and appurtenances shall be tested at the same duration and pressure as the piping system they are in. If any joint proves to be defective, it shall be repaired to the satisfaction of the LWC Project Manager and the KYTC Resident Engineer.
- C Install all brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.
- D All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves and other equipment which do not operate easily, or are otherwise defective, shall be repaired or replaced at not additional cost.
- E Unless otherwise specified or approved by the LWC Project Manager, all newly installed gate valves shall maintain a minimum 12" of cover as measured from the top of ground elevation to the top nut elevation.

- F All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to these items shall be repaired to the satisfaction of the LWC Project Manager before they are installed.
- G After installation, all valves and appurtenances shall be tested at least one (1) hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the LWC Project Manager.
- H All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning; and all nuts and bolts checked for tightness. Valves and other equipment that do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to the OWNER.

3.02 SHOP PAINTING

- A Interior surfaces of all valves except the exterior surfaces of buried valves and miscellaneous piping appurtenances shall be given a shop finish of an asphalt varnish conforming to Federal Specification TT-V51e for Varnish Asphalt.
- B. The exterior surface of various parts of valves, operators, floorstands and miscellaneous piping shall be thoroughly cleaned of all scale, dirt, grease or other foreign matter and thereafter one shop coat of an approved rust-inhibitive primer such as Inertol Primer No. 621 shall be applied in accordance with the instructions of the paint manufacturer. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating.
- C General - The finish coating materials shall be suitable for potable water service, and shall conform to the applicable requirements of the latest revision to AWWA C550, Protective Interior Coatings for Valves and Hydrants. All internal and external surfaces, except finished or bearing surfaces, shall be shop-cleaned and coat-applied in accordance with this Specification and with the applicable Steel Structure Painting Council (SSPC) Specifications. A light color shall be used to enhance inspection and maintenance.
- D Surface Preparation - Surface irregularities, such as weld spatter, burrs, and sharp or rough edges, shall be eliminated prior to surface preparation. Surfaces shall be prepared in accordance with Steel Structures Painting Council Specifications SP-6, Commercial Blast Cleaning, with 1.5-3.0 mils profile depth. If grease or spills are present, solvent cleaning to SSPC SP-1 quality must precede SP-6.
- E Paint System and Application - Coatings shall be applied in accordance with the recommendations found in SSPC PA-1, Shop, Field, and Maintenance Painting. The paint system shall be a two-coated catalyzed epoxy system for ferrous and non-ferrous metals subject to chemical corrosion or physical abrasion. The first coat shall be a high-build catalyzed epoxy with a minimum 50 percent solids applied by volume, applied at 6 - 8 mils (dry). The second coat shall be the same as the first coat. The system's total thickness shall be 12 mils (dry) minimum, and shall be holiday-free when tested in accordance with AWWA C550, using a holiday detector such as Tinker and Raser MI/AC.

3.03 INSPECTION AND TESTING

- A. The various pipelines in which the valves and appurtenances are to be installed are specified to be field-tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable to the LWC Project Manager and the KYTC Resident Engineer.
- B. Valve and Actuator - The test program outlined in AWWA Specification C515-09 shall be followed for Performance, Leakage, and Hydraulic tests, except, that the provision to substitute a hydrostatic test

(Section 5.2.2.2) shall be disallowed, and valves are to be tested in both directions. A copy of a previous proof-of-design test shall be acceptable. The Supplier shall submit an affidavit of compliance with testing and other provisions of AWWA C515-09, as modified herein, with the submittal required by Part 1.03 above. The Supplier shall send a certification of compliance of capabilities of the actuators furnish as a component of each unit.

- C. Coating - The Supplier shall submit an affidavit of compliance, signifying that the coating and application complies with the requirements of AWWA C550 Protective Interior Coatings for Valves and Hydrants and Steel Structure Painting Council's Steel Structures Painting Manual, Volumes 1 and 2. Test data related to the requirements of Section 2 and the toxicological compatibility of the coating materials with potable water application shall be submitted along with the affidavit.

END OF SECTION

Standard Sanitary Sewer Bid Item Descriptions

S BYPASS PUMPING This item shall include all labor, equipment, and materials needed to complete a bypass pumping and/or hauling operation for diversion of sewage during sanitary sewer construction. Examples of such operations when bypass pumping and/or hauling may be necessary is during force main tie-ins, manhole invert reconstruction, insertion of new manholes into existing mains, or other similar construction. There may be more than one bypass pumping/hauling operation on a project. This item shall be paid for each separate bypass pumping/hauling operation occurrence as called out on the plans or directed by the engineer and actually performed. There will be no separate bid items defined for length, duration, or volume of sewage pumped or hauled in each occurrence. If a bypass pumping/hauling operation is called out on the plans; but, conditions are such that the bypass pumping/hauling operation is not needed or utilized, no payment will be made under this item. The contractor shall draw his own conclusions as to what labor, equipment, and materials may be needed for each bypass pumping/hauling occurrence. The contractor should be prepared to handle the maximum volume of the sewer being bypassed, even during a storm event. This item shall not be paid separately, but shall be considered incidental, when bypass pumping and/or hauling is needed during cast-in-place-pipe (CIPP) and/or point repair operations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA).

S CIPP LATERAL SERVICE INVESTIGATION This item shall include all equipment, materials, labor and incidentals necessary to enter the sewer in compliance with all safety/confined space requirements and perform the identification, assessment and pre-measurement of all existing and abandoned laterals for the placement of Cured-In-Place-Pipe lining. This item shall be in payment for all lateral service investigation for all sewer segments to be lined as a part of this contract. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be LUMP SUM (LS).

S CIPP LATERAL REINSTATEMENT This item is to pay for installing a Cured-In-Place-Pipe liner in service laterals and service/mainline connections to stabilize structural defects and construction inadequacies. This bid item shall include all labor, equipment, materials and incidentals necessary to perform the service lateral reinstatement in accordance with the plans and specifications. Work under this item shall include sewer flow control, pre-installation cleaning, sealing connections to existing sewer main, pre- and post- construction CCTV inspection and final testing of the CIPP system. This item shall also include the "top hat" required by the specifications. All CIPP lateral reinstatements shall be paid under this item regardless of the size or length of reinstatement. No separate bid items of varying sizes or length of CIPP lateral reinstatement will be provided in the contract. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be EACH (EA) for each CIPP lateral reinstatement complete and ready for use.

S CIPP LINER This bid Item is to pay for rehabilitation of existing sanitary sewers using the Cured-In-Place-Pipe method. This bid item description applies to all CIPP sizes included in the contract.

All CIPP Liner items of all varying sizes shall include all labor, materials, customer notification, testing, necessary permits, ingress and egress procedures, bypass pumping, pre- construction video, sediment and root removal, dewatering, traffic control, erosion and sediment control, excavation pits, removal and replacement of manhole frames and covers as necessary to facilitate the lining work, sealing at manholes and service connections, clearing and grubbing, pipeline cleaning, re-cleaning and video inspection as many times as necessary, debris collection and disposal, root removal, pre- and post-construction video inspection, all digital inspection footage, final report preparation and approval, the cost of potable water from the Owner, required compliance tests, site restoration, site cleanup, sealing of liner at manholes, acceptance testing and all other rehabilitation work and incidentals not included under other pay items necessary to complete the rehabilitation per the plans and specifications. There will be no separate payment for acceptance testing of the lined pipe; but shall be considered incidental to this item. Pay under this item shall be by each size bid in the contract. Pay measurement shall be from center of manhole to center of manhole. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S CIPP PROTRUDING LATERAL REMOVAL This item includes all equipment, materials, labor and incidentals necessary to enter the sewer in compliance with all safety/confined space requirements, remove a sufficient amount of the protruding tap to insure a proper and safe Cured-In-Place-Pipe lining insertion and perform pre-installation CCTV. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be EACH (EA) for each protruding lateral removed.

S CONCRETE PIPE ANCHOR This item shall be constructed on the sewer pipe at the locations shown on the plans in accordance with sanitary sewer specifications and standard drawings. Payment for concrete anchors will be made at the contract unit price each in place complete and ready for use. Each concrete anchor of sewer pipe or force main shall be paid under one bid item per contract regardless of the sizes of carrier pipe being anchored in the contract. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

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

S ENCASEMENT CONCRETE Includes all labor, equipment, excavation, concrete, reinforcing

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

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

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

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

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

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

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

S FORCE MAIN This description shall apply to all PVC and ductile iron and polyethylene/plastic pipe bid items of every size and type, except those bid items defined as “Special”. This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. This item shall also include pipe anchors on polyethylene pipe runs as shown on the plans or required by the specifications to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

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

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

S FORCE MAIN POINT RELOCATE This item is intended for payment for horizontal and/or vertical relocation of a short length of an existing main at the locations shown on the plans. This bid item is to be used to relocate an existing force main at point locations such as to clear a conflict at a

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

S FORCE MAIN TAP SLEVE/VALVE RANGE 1 OR 2 This item shall include the specified tapping sleeve, valve, valve box, concrete pad around valve box (when required in specifications or plans), labor, and equipment to install the specified tapping sleeve and valve, complete and ready for use in accordance with the plans and specifications. The size shall be the measured internal diameter of the live pipe to be tapped. The size tapping sleeve and valve to be paid under sizes 1 or 2 shall be as follows:

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

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

S FORCE MAIN TIE-IN This bid description shall be used for all force main tie-in bid items of every size except those defined as "Special". This item includes all labor, equipment, excavation, fittings, sleeves, reducers, couplings, blocking, anchoring, restoration, testing and backfill required to make the force main tie-in as shown on the plans and in accordance with the specifications complete and ready for use. This bid item shall include purge and sanitary disposal of any sewage from any abandoned segments of force main. Pipe for tie-ins shall be paid under separate bid items. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

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

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

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

S LATERAL CLEANOUT This item shall be for payment for installation of a cleanout in a service lateral line. This item shall include furnishing and installation of a tee, vertical pipe of whatever length required, and threaded cap. The cleanout shall extend from the lateral to final grade elevation. The size of the cleanout shall be equivalent to the size of the lateral. The cleanout materials shall meet the same specification as those for the lateral. The cleanout shall be installed at the locations shown on the plans or as directed by the engineer. Only one pay item shall be established for cleanout installation. No separate pay items shall be established for size or height variances. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S LATERAL LONG SIDE This bid item description shall apply to all service lateral installations of every size up to and including 6 inch internal diameter, except those lateral bid items defined as "Special". This item includes the specified piping material, main tap, bends, clean outs, labor, equipment, excavation, backfill, testing, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service lateral installations where the ends of the lateral connection are on opposite sides of the public roadway. The new lateral must cross the centerline of the public roadway to qualify for payment as a long side lateral. The length of the service lateral is not to be specified. Payment under this item shall not be restricted by a minimum or maximum length. The contractor shall draw his own conclusions as to the length of piping that may be needed. Payment under this item shall include boring, jacking, or excavating across the public roadway for placement. Placement of a service lateral across a private residential or commercial entrance alone shall not be reason to make payment under this item. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S LATERAL SHORT SIDE This bid item description shall apply to all service lateral installations of every size up to and including 6 inch, except those lateral bid items defined as "Special". This item includes the specified piping material, main tap tee, bends, clean outs, labor, equipment, excavation, backfill, testing, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for lateral installations where both ends of the lateral connection are on the same side of the public roadway, or when an existing lateral crossing a public roadway will remain and is being extended, reconnected, or relocated with all work on one side of the public roadway centerline as shown on the plans. The length of the service lateral is not to be specified and shall not be restricted to any minimum or maximum length. Payment shall be made under this item even if the lateral crosses a private residential or commercial entrance; but, not a public roadway. Private or commercial

entrances shall not be considered a public roadway in defining payment under this item. The contractor shall draw his own conclusions as to the length of piping that may be needed. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

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

S MANHOLE Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole. Payment for manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup in accordance with the specifications and standard drawings. All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE ABANDON/REMOVE Payment under this item is for the partial removal and/or filling of any sanitary sewer manhole regardless of size or depth that no longer serves any purpose. Payment shall be made regardless of whether the manhole is or is not in conflict with other work. Any manhole requiring partial removal, but not total removal, in order to clear a conflict with other work shall be paid under this item. All manholes partially removed shall be removed to a point at least one foot below final grade, one foot below roadway subgrade, or one foot clear of any other underground infrastructure, whichever is lowest. If partial removal of an abandoned manhole is elected by the contractor, the remaining manhole structure shall be refilled with flowable fill. Payment for disposal of a sanitary sewer manhole will be made under this item only. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE ADJUST TO GRADE Payment under this item is for the adjustment of sanitary sewer casting elevation on all sizes of existing sanitary manholes. This work shall be performed in accordance with the sanitary sewer specifications. Payment shall be made under this bid item regardless of the amount of adjustment necessary to a sanitary sewer manhole casting or diameter of the manhole. Work under this pay item may be as simple as placing a bed of mortar under a casting; but, shall also be inclusive of installation of adjusting rings, and /or addition, removal, or replacement of barrel sections. The existing casting is to be reused unless a new casting is specified on the plans. New casting, when specified, shall be paid as a separate bid item. Anchoring of the casting shall be incidental to this item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA)

when complete.

S MANHOLE CASTING STANDARD Payment under this bid items is for furnishing of a new standard traffic baring casting for sanitary manholes meeting the requirements of the sanitary sewer specifications and standard drawings. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when installed.

S MANHOLE CASTING WATERTIGHT Payment under this bid item is for furnishing of a new watertight traffic baring casting for sanitary manholes meeting the requirements of the sanitary sewer specifications and standard drawings. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when installed.

S MANHOLE RECONSTRUCT INVERT This bid item is to pay for all labor, equipment, and material for rework of the manhole bench to redirect or eliminate flow, such as when the flow of a pipe or pipes are being removed or redirected. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in elimination or redirect of flow. This item shall also include providing and placement of a rubber seal or boot as required by utility specification, standard drawing or plan. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the specifications, standard drawings, and plans. No payment shall be made under this bid when MANHOLE TAP EXISTING, or MANHOLE TAP EXISTING ADD DROP are being paid at the same location, as this type of work is included in those items. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE TAP EXISTING This bid item is to pay for all labor, equipment, and material for coring one opening in an existing manhole base, addition of a rubber seal as specified, and rework of the manhole bench to direct the additional pipe flow. The bid item shall be paid for each core opening added to a single manhole. This bid item shall also include any rework of the existing manhole bench due to the elimination of other existing pipes and flow. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in the addition, elimination, or redirect of flow. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the specifications, standard drawings, and plans. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE TAP EXISTING ADD DROP This bid item is to pay for all labor, equipment, and material for coring one opening in an existing manhole base, addition of a rubber seal as specified, addition of a vertical drop pipe to the outside of the manhole, placement of reinforcing steel and concrete to encase vertical pipe, and rework of the manhole bench to direct the additional pipe flow. The bid item shall be paid for each drop added to a single manhole. This bid item shall also include any rework of the existing manhole bench due to the elimination of other existing pipes and flow. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in the addition, elimination, or redirect of flow. The contractor shall draw his own conclusions as to the effort and

scope of work needed to comply with the specifications, standard drawings, and plans. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH DROP Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole with drop. Payment for drop manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Drop manholes shall include concrete base, barrel sections, drop materials, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup. All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH LINING Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole with corrosion resistant lining. Payment for manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or slab top, steps, lining, excavation, backfilling, air testing, restoration, and cleanup in accordance with the standard drawings. All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH TRAP Payment under this item is for the installation of a new manhole with trap. Payment for trap manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Trap manholes shall include concrete base, manhole structure and trap materials, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup. All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S PIPE This description shall apply to all PVC and ductile iron gravity sewer pipe bid items of every size and type 8 inches internal diameter and larger, except those bid items defined as "Special". This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to,

tap tees and couplings for joining to existing similar or dissimilar pipes), polyethylene wrap (if required by specification), labor, equipment, excavation, bedding, restoration, pressure or vacuum testing, temporary testing materials, video inspection, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. This bid item shall include material and placement of flowable fill under existing and proposed pavement, and wherever specified on the plans or in the specifications. No additional payment will be made for rock excavation. Measurement of quantities under this item shall be through fittings and encasements to a point at the outside face of manhole barrels, or to the point of main termination at dead ends or lamp holes. Carrier pipe placed within an encasement shall be paid under this item and shall include casing spacers and end seals. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S PIPE POINT REPAIR This item is to be used to pay for repair of short lengths of existing sanitary sewer pipe that, through prior video inspection or other means, are known to have pre-existing failure. Pipe Point Repair may be needed in preparation for installation of cured-in-place-pipe (CIPP) lining or other instances where failure is known and repair is prudent. The size of pipe shall not be defined in separate bid items. All diameter sizes of point repair shall be paid under this one item. The materials to be used to make the repair shall be as defined on the plans or in the specifications. This bid item shall include all excavation, pipe materials, joining materials to connect old and new pipe, bedding, and backfill to complete the repair at the locations shown on the plans or as directed by the engineer, complete and ready for use. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA).

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

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

S STRUCTURE REMOVAL This item is to be used to pay for removal of larger above or below ground sewer structures such as air release/vacuum valve vaults, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however, structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to sewer

construction, (i.e., removal of standard air release/vacuum valves and their structure up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted backfill for removal of the structure and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

SHEPHERDSVILLE STANDARD SPECIFICATIONS - INDEX

SHEPHERDSVILLE STANDARD SPECIFICATIONS

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SECTION 1

CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS

GENERAL PROVISIONS

1.1 DESCRIPTION OF WORK

All labor, materials, equipment, tools and services required for the furnishing, installation, construction, video recording, and testing of all sanitary sewer or storm drainage facilities required for this Project shall be furnished, installed, constructed, recorded and tested in accordance with these specifications and all other City of Shepherdsville specifications and standard drawings. These Specifications cover the materials to be utilized in construction, and the installation and construction standards to be required of the Contractor for Capital Improvement Projects and Private Development Projects approved by the City of Shepherdsville.

1.2 VIDEO RECORDING

Prior to the start of construction, the Contractor shall provide one original walking, narrative continuous VHS video, a minimum 2 to 3 minutes per 100 feet of alignment, of the complete Capital Project as directed by the City of Shepherdsville Construction Inspector. The tape counter value should be keyed to each manhole, drainage structure, or building address, labeled accordingly. In the case of private development, the contractor shall video all areas outside the property owned by the developer such as right-of-ways, easements or private property on which the developer has an agreement to be on.

1.3 UNDERGROUND STRUCTURES AND UTILITIES

Every effort will be made to show on the Plans by the City's Engineer or the Developers Engineer known utilities, structures, drains, etc., adjacent to or to be encountered by construction. The locations shown on the Plans are taken from existing records and are believed to be the best information available. However, it is expected that there may be some discrepancies or omissions in the locations and quantities shown. The Contractor shall verify the locations of all underground structures and utilities in critical areas or as directed by the City of Shepherdsville prior to the start of construction. The Contractor shall avoid damaging the existing utilities while verifying their locations. Such information is furnished subject to the limitations set out in the City of Shepherdsville's Information to Bidders.

The Contractor shall notify the Kentucky Underground Utility Protection, Inc. (formerly BUD) at 1-800-752-6007, 48 hours in advance of any construction. The Contractor shall notify the City of Shepherdsville prior to any personnel being allowed to enter into any City of Shepherdsville manhole or sewer.

The Contractor shall be responsible for protection of any structure or utility encountered on the site. The cost of repair, removal, replacement, relocation, etc. of such facilities arising

because of carelessness or negligence on the part of the Contractor shall be the Contractor's responsibility.

The Contractor shall make every reasonable effort to protect private structures and utility service connections whether in right-of-way/easement or on private property, including sewer facilities that may not be shown on the Plans. When these facilities are disturbed or damaged by the Work, the Contractor shall make necessary repairs to the facilities for continuous service prior to the close of the work day, at the Contractor's expense.

Should uncharted or incorrectly charted piping or other utilities be encountered within utility easements or the public rights-of-way, the Contractor shall immediately contact the City of Shepherdsville or should contact the Developer's Engineer for private development projects.

Suitable arrangements will be made with the proper agency by the City of Shepherdsville and the responsibility for the cost will be determined by the City of Shepherdsville. All arrangements with the proper agency for Private Development work shall be the responsibility of the contractor and/or developer. The Contractor shall cooperate and coordinate with the utility companies to keep respective services and facilities in operation. Coordination is the responsibility of the Contractor.

1.4 WORK AROUND LOUISVILLE GAS AND ELECTRIC COMPANY OR SALT RIVER ELECTRIC FACILITIES

1.4.1 General

The Louisville Gas and Electric Company or Salt River Electric Cooperative shall be given 5 working days advance notice before Work is begun. When revamping of facilities will be required, at least 2 weeks advance notice shall be given the Louisville Gas and Electric Company or Salt River Electric Cooperative to allow sufficient time for engineering Work to be completed. On major modifications or relocations, longer notice will be necessary. Coordination is the responsibility of the Contractor. The Contractor shall cooperate and coordinate with the utility companies to keep respective services and facilities in operation.

1.4.2 Electric Facilities

Blasting shall not be done under or near an electric line unless a representative of the Louisville Gas and Electric Company or Salt River Electric is present.

The Contractor shall not utilize utility poles for physical support of any of his operations. Cables, ropes or support systems shall not be attached to utility poles.

If damage to electric lines should occur, the Contractor shall notify the Louisville Gas and Electric Company or Salt River Electric Cooperative immediately.

1.4.3 Gas Facilities

No blasting shall be done within 10 feet of a gas main unless a representative of the Louisville Gas and Electric Company is present.

Special care should be taken not to break or damage gas mains or service lines during construction. If damage does occur to gas mains or service lines the Contractor is responsible for assisting and coordinating all repairs and notifying affected property owners before and after repairs.

Damage to a service line by the Contractor shall immediately be reported to the Louisville Gas and Electric Company and shall be repaired at the expense of the Contractor. Such repairs shall be limited to that portion of the service line which is in the public right-of-way or easement.

Extra precaution shall be taken during construction near high-pressure mains. If it becomes necessary to expose the Louisville Gas and Electric Company's pipelines as a precautionary measure, advise the Company by calling 589-5511, Gas Trouble Clerk (24 hours).

1.5 GEOTECHNICAL INFORMATION

Borings and soundings may or may not be shown on the Plans. If borings and soundings are not shown, and the Contractor desires to have positive soil information, the Contractor shall make such borings and soundings at the Contractor's expense. Prior to making borings or soundings, the Contractor shall receive approval from the property owner, or if within the road rights-of-way, from the appropriate agency and shall notify the City of Shepherdsville. The City of Shepherdsville does not guarantee that the boring information shown in the Bid Documents is accurate or correct. Such information is furnished subject to the limitations set out in the Contract.

1.6 SURVEYING AND STAKING

1.6.1 General

The responsibilities for the surveying and staking necessary for the construction of the Project shall be as defined herein. The City of Shepherdsville will provide all surveying necessary to establish the horizontal and vertical control coordinates, including the setting of monuments meeting the City of Shepherdsville standards, and benchmarks for such control on all the City of Shepherdsville projects.

All surveying control points on Capital Projects will be furnished by the City of Shepherdsville one time only unless otherwise provided in the Contract. The Contractor shall be responsible for protecting and preserving all such surveys provided by the City of Shepherdsville, including monuments, benchmarks, survey stakes, reference points, or other survey markers and shall be required to bear the expense of replacing or resetting same if damaged or destroyed.

The Contractor will provide all construction survey and staking necessary for layout and construction from the control points on Capital Improvement Projects. The

Contractor, through the field inspector, shall give the City of Shepherdsville two weeks advance notice prior to the start of survey. The Contractor shall provide temporary benchmarks within 300 linear feet of all proposed structures.

Where new construction connects to existing facilities, it shall be the Contractor's responsibility to check and determine the exact location of the existing facilities. Whenever field conditions are found to vary from those indicated on the Plans, the Contractor should notify the City of Shepherdsville immediately. The City of Shepherdsville will investigate such conditions and, if warranted, make revisions or adjustments. The Contractor shall not proceed with that portion of the Work until the investigation is complete and redlined Plans have been approved by the City of Shepherdsville.

1.6.2 Construction Staking

Offset hubs and stakes, one short (12 inch) hub and one tall (36 inch) stake at each location, shall be set at all 100-foot stations for gravity flow sanitary and storm drainage facilities, and at 200-foot stations for all force mains. In paved areas, PK nails and paint shall be used. In addition, offset hubs and stakes shall be provided at line intersections, appurtenances, points where the alignment or grade changes and a minimum of two offset hubs shall be provided at rear structure corners.

The stakes shall be strong, sound, straight, and free from knots, dressed on two sides, and pointed. Hubs shall be strong, sound, undressed oak lumber, and pointed. Stakes shall be a minimum of 3/4 inch x 1 1/2 inches when dressed, and hubs shall be a minimum of 2 inches square and 12 inches long. Stake widths and lengths of both stakes and hubs may vary if so ordered by the City of Shepherdsville.

1.6.3 Checking Line and Grade

The Contractor shall provide the City of Shepherdsville with a copy of field book notes and complete cut sheets showing stations, grade stake elevations, required slopes, invert elevations and cut distances for sewer main, structures and pipe stubs. The Contractor shall provide transit, level in good adjustment, grade pole and the necessary equipment, and a competent employee during normal working hours to assist the City of Shepherdsville, so that the checking and measuring may be accomplished with the least interference to the Contractor's operations. All property service connections (PSC) and pipe stubs with lengths in excess of 5 feet shall have elevations and stations referenced by the Contractor's Professional Land Surveyor. All stubs ends shall be referenced before being covered.

If a laser beam is used to maintain the line and grade, the Contractor shall periodically calibrate and check the accuracy of the laser beam with reference to a grade stake per manufacturer's recommendation. Calibration seal shall be kept with the instrument on site for review by the City of Shepherdsville as requested. The Contractor shall use a blower or other acceptable device to vent enclosed conduits as required to prevent refraction.

1.6.4 Final Record Drawings

On City of Shepherdsville projects, the Final Record Drawings will be prepared by the City, or the project design engineer / consultant, based on record information provided to the City by the Contractor. At the completion of the project, the contractor will be responsible for providing the City a set of “Red Line Drawings” and “As-Built Survey Information” as indicated below. The information will be incorporated into the bid plans to become the Final Record Drawings.

Note – On private development projects, the project design engineer / consultant will be responsible for preparing the Final Record Drawings, subject to the same requirements as a City project.

1.6.4.1 Red Line Drawings

The Contractor shall keep a record of all deviations of any installation from that shown on the Plans. Records shall also be kept of any significant changes in installations from shop drawings. The information will be compiled in a red-lined format on the shop drawings and a copy of the initial bid plan set. Plans shall be available to the City at any time upon request during construction. No such deviations from the Plans or approved shop drawings shall be made without prior approval by the City of Shepherdsville. Should the as-built drawings reflect that unapproved deviations during the construction process have taken place, the City of Shepherdsville shall be notified in writing. If it is determined by the City that said deviations compromise the intent of the design, the contractor shall be held responsible for reconstruction. As the completion of the project the as-built information is submitted to the City. The information should be recorded in a clear and concise format, allowing for an easy transfer.

1.6.4.2 As-Built Survey Information

The Contractor’s Licensed Professional Land Surveyor will be responsible for creating as-builts for the items listed below. The survey information will be compiled in an electronic fashion, compatible with the .dwg format, and submitted to the City of Shepherdsville. Location and elevations shall be tied to the project survey control.

The following construction items, at a minimum, should be reviewed and verified to produce the Final Record Drawings:

❖ Alignment Changes:

➤ Changes in Location for:

- Manholes
- Catch Basins or Surface Inlets
- Headwalls
- Retaining Walls
- Slope Protection

- Channel Linings
 - Pump Station Wet Wells
 - Pump Station Valve Vaults
 - Air Release Valves
 - Property Service Cleanouts
- Changes in Elevation for:
- Nearest Hundredth
 - Inverts
 - Rims
 - Surface Inlet Grates
 - Paved Ditches
 - Nearest Tenth
 - Turf Ditches
 - Miscellaneous Structures
- ❖ Structural Changes:
- General:
- Manhole collar sizes
 - All revisions in pipe size, lengths, slopes, and angles
 - Identify pipe material if different from the plans
- For Pump Stations and Wastewater Treatment Plants:
- All revisions in pipe sizes
 - All revisions to electrical controls
 - All revisions to exhaust and ventilation systems
 - Pump modifications
 - Changes in elevation for inverts and level controls
 - Equipment layout modifications
 - Building modifications
- ❖ Miscellaneous Changes:
- For Property Service Connections
- Size
 - Length
 - Depth at R/W or Property Line
 - Sewer Station
 - End Location, if the PSC is not perpendicular to the sewer
- For changes in Lot of Unit Designations
- Lot numbers
 - Tract numbers
 - Apartment unit designations
 - Condominium unit designations
 - Patio home designations

1.6.4.3 Process

Proposed information shall under no circumstances be erased from the original Plans. Plan corrections must be made to ensure a quality image. No red line markings will be accepted for final record drawings. A check mark should be placed beside the original Plan information which has been verified to be correct as constructed. Any unverified data shall show +/- thereby indicating that information has not been verified.

The following stamp will be inserted into each plan sheet after all as-built information has been added.

<p>Final Record Drawing By _____ Date _____ Contractor _____ Record Drawings have been prepared based on information provided by the Contractor in accordance with the specifications.</p>
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1.7 MAINTENANCE AND CONTROL OF TRAFFIC

1.7.1 Permits and Notification.

The City of Shepherdsville will be responsible for obtaining the necessary County, and/or State encroachment permits for Work in public rights-of-way as applicable on Capital Improvement Projects. The Developer and/or his Engineer or Contractor shall obtain all permits on Private Development Projects. The Contractor is required to abide by all the conditions of the encroachment permit(s) and they shall be made a part of the Capital Improvement Contract or private development work.

The Contractor shall notify the City of Shepherdsville’s Engineer or Bullitt County Road Department or the Kentucky Transportation Cabinet, where applicable, in writing and with a copy to the City of Shepherdsville, at least one week prior to beginning any Work in the public rights-of-way. Maintenance of traffic (or traffic control) plan shall be supplied by the Contractor, and approved by the appropriate governing agency. The Contractor shall obtain permits on Private Development Projects, storm water, and non City of Shepherdsville sanitary sewer facilities.

1.7.2 Traffic Control.

At a minimum the Contractor shall provide and maintain traffic control signs, barricades, barriers, warning lights and flaggers as necessary to meet the standards for traffic control, as outlined in the Manual on Uniform Traffic Control Devices, latest revision, or as noted in the permits and the Contract. Additional traffic control measures, including signs, shall be furnished upon the request of the City and at no additional cost to the City of Shepherdsville on Capital Improvement Projects and at the Contractors/Developers cost on Private Development Projects.

1.7.3 Maintenance of Traffic.

The Contractor shall keep all roads and streets, affected by construction, clean from mud or debris and open to all traffic. Where so provided on the Plans or as directed by the City of Shepherdsville, the Contractor may route the traffic over approved detour routes. The Contractor shall keep the portion of the Project being used by public traffic in such condition that traffic will be adequately and safely accommodated.

The Contractor must maintain proper, sufficient, and continuous ingress and egress to private properties and access to buildings unless otherwise shown in the Contract or where temporary interference to access is authorized by the City of Shepherdsville. Provisions shall be made for owners and occupants to reach their premises and for emergency vehicles to have access at all times. The Contractor shall provide access to private properties by bridging, use of steel plates, or other means acceptable to the City of Shepherdsville. Where temporary interference is authorized, it shall be interrupted only for such time as necessary to provide temporary substitutes for surfaces disturbed by the construction and to restore street and sidewalk surfaces after the completion of the Work. The Contractor is to notify each day, all community services, which includes contacting School Districts, U.S. Post Office, Central Dispatch for Bullitt County, Bullitt County EMS and the City of Shepherdsville Police Department by facsimile when performing Work on the pavement that may in any way impede traffic. When fire hydrants are taken out of service, a facsimile of the location of the fire hydrant must be sent and a copy given to the Louisville Water Company for their approval prior to this occurring.

1.8 AIR POLLUTION CONTROL

1.8.1 General

The Contractor shall perform construction activities in such manner so as to prevent air pollution from occurring as the result of drilling, blasting, grading, hauling, or any other construction activities of any kind in conformity with applicable provisions of the Air Pollution Control Regulations.

1.8.2 Open Burning

Open burning will not be permitted on the construction site except as approved by the City of Shepherdsville.

1.8.3 Dust Control

Water or approved chemical additives shall be applied on roadways, stockpiles, graded areas, etc. to prevent and abate fugitive dust resulting from the Contractor's operations. Paved streets and roads shall be kept clean of all earth materials deposited by the Contractor's operations.

1.8.4 Equipment

The Contractor's equipment shall be maintained to prevent excessive fumes, gases, vapors, noise, or fluids from escaping and creating a nuisance to the public.

1.9 STANDARDS AND SPECIFICATIONS

1.9.1 KTC Standard Specifications and Drawings

Reference is made to the Kentucky Transportation Cabinet (KTC) Standard Specifications for Road and Bridge Construction and the KTC Standard Drawings in various sections of these Specifications. The Contractor shall secure the latest Edition of the KTC Standard Specifications and the latest edition of the KTC Standard Drawings when performing Work which is described therein. Copies may be obtained from:

Kentucky Transportation Cabinet
Manager, Policy and Procedures
Development Branch
112 State Office Building
Frankfort, Kentucky 40622

1.9.2 Latest Revisions

Wherever reference is made to any published standards, codes or standard specifications, it shall mean the latest standard code, specification or tentative specification of the technical society, organization or body to which reference is made. Where specified articles, sections, paragraphs or other subdivisions of the referenced publications are not stated, the referenced publication shall apply in full.

1.10 WATER SUPPLY AND SANITARY FACILITIES

1.10.1 Water Supply

The Contractor shall provide, at convenient points, including the City of Shepherdsville's field office, ample fresh supplies of water of proper quality and quantity for all labor, inspection, and operations required under Capital Improvement Contracts. The supply of drinking water shall be contained in a suitable cooler or other approved sanitary container. The Contractor shall also provide paper cups.

1.10.2 Sanitary Facilities

The Contractor shall provide sanitary facilities for the duration of the Capital Improvement Contract for all labor and inspection personnel and will comply with the regulations of the local and state health departments. Inspection and Contractor's facilities shall be separate. The sanitary facilities for the City of Shepherdsville inspector shall be a lockable, portable toilet and shall be located at or near the City of

Shepherdsville's field office when a field office is specified. The Contractor shall clean and maintain these facilities on a weekly basis.

1.11 ENGINEER'S FIELD OFFICE

When specified in the Capital Improvement Contract, the Contractor shall furnish, for the exclusive use of the City of Shepherdsville, an approved weatherproof, lockable building to be utilized as a field office. It shall be located conveniently on or near the Project, and shall be independent of any buildings used by the Contractor. Adjacent to the field office there shall be two graveled parking spaces for the exclusive use of the City of Shepherdsville. The field office shall have approved OSHA steps with handrail. The field office shall have not less than: 200 square feet of usable floor space, 8 feet ceiling heights, 3 windows, a door, and a wooden floor or better. The field office shall be furnished with an instrument locker 2 feet by 3 feet in plan and 5 feet high, with adjustable shelves, a hinged wall table 3 feet by 6 feet, a suitable desk, drafting stool, 2 serviceable swivel office chairs, a coat rack, trash can, fire extinguisher, a fully stocked first aid kit (in accordance with Kentucky Occupational Safety and Health Standards for the Construction Industry Subpart C, Section 1926.50), and a standard 4 drawer lockable file cabinet with key. The building shall be equipped with, electric lighting, adequate heating and air-conditioning, and an integrated telephone answering machine and facsimile, including call waiting and touch-tone service. Facsimile machines shall be either Brother Multi-Function Fax1950 or Sharp Multi-Function Plain Paper Fax - Model UX-1400, or their equivalents.

Contractors, whose main office is outside the Shepherdsville calling area, shall furnish the field office with a toll-free number. All costs of local phone calls, all other utilities and calls to the general Contractor shall be included in that part of the Contract Price attributable to the City of Shepherdsville's field office.

The Contractor shall have the City of Shepherdsville's field office set up and fully operational within two (2) weeks from the date of execution of the Contract and prior to commencing construction. The field office shall remain on the Work site and be cleaned and maintained weekly until formal acceptance of the Project.

No Work shall be performed until the field office is operational.

All items stored in the field office shall be covered by the Contractor's insurance, including all property of the City of Shepherdsville and the City of Shepherdsville's employees located within the field office.

SECTION 2

CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS

SITE PREPARATION, EROSION PREVENTION AND SEDIMENT CONTROL

2.1 DESCRIPTION OF WORK

2.1.1 Site Preparation

This Work shall consist of the removal and disposal of all rubbish, fences, pavements, structures, all trees, shrubs, brush and herbaceous vegetation not to be protected, and all other obstacles within the rights-of-way/easement limits shown on the Plans. It shall include the protection of trees, shrubs, plants, fences, turfed areas, pavements and structures as identified in the contract documents or on the plans throughout the construction project.

2.1.2 Erosion Prevention

This Work shall consist of the temporary erosion control measures to be performed during the life of the Project to minimize soil erosion from land surfaces and water conveyances. Measures include temporary and permanent soil stabilization, flow diversion, and outlet stabilization.

2.1.2.1 Temporary Soil Stabilization

This Work shall consist of seed bed preparation, furnishing and placing seed, mulch, netting and staples, erosion control blankets, and caring for such areas until acceptance. The Contractor shall remove the netting and staples, 30 to 45 days after installation, or after the grass has become established.

Temporary soil stabilization shall be used in the following circumstances:

- (A) In non-paved areas, rough grading and permanent soil stabilization or temporary soil stabilization shall be maintained within 1,500 linear feet of the active excavation unless more stringent limits are required by the Erosion Prevention and Sediment Control Plan. In no case shall the time between completion of construction activities and the completion of permanent or temporary stabilization exceed 14 calendar days.
- (B) Where construction operations are temporarily suspended for 14 days or longer and permanent soil stabilization is not practical.

- (C) When an immediate cover would be desirable to minimize erosion, siltation, or pollution of any area.

2.1.2.2 Temporary Stabilization of Waterways

This work shall consist of the installation of erosion control blankets as temporary protection for waterways when their construction is completed outside the acceptable work interval for permanent seeding or sodding.

2.1.2.3 Flow Diversion

This Work shall consist of the construction and stabilization of runoff channels and/or berms to divert runoff from undisturbed areas around disturbed areas. The Work may also consist of the diversion of stream flow around active construction areas during Work across a stream.

2.1.2.4 Outlet Stabilization

The Work shall consist of the installation of measures that slow flow velocities to acceptable levels to prevent erosion of water conveyances (ditches, swales and diversions) and land surfaces.

2.1.2.5 Temporary Stream Crossings

This work shall consist of the installation, maintenance and removal of temporary structures to provide construction and equipment access across streams and the diversion of stream flow around construction activities.

2.1.3 Sediment Control.

This Work shall consist of the temporary sediment control measures, such as those included in Section 2.3.3 of these Specifications, to be performed during the life of the Project to control water pollution caused by erosion of exposed soil. Sediment control facilities shall be properly installed and maintained per details, and the Erosion Prevention and Sediment Control Plan. Controls found to be inadequate must be redesigned and modified in accordance with an approved redline drawing.

2.1.4 Erosion Prevention and Sediment Control Plan.

An EPSC Plan is developed for every City of Shepherdsville Project as part of the Project design. The Plan may be revised, with the City of Shepherdsville's approval, to work within constraints imposed by equipment or construction techniques.

2.2. MATERIALS

2.2.1. Topsoil.

Topsoil shall meet the requirements set forth in Section 827 of the KTC Standard Specifications.

2.2.2. Temporary Seed.

Seed used for temporary seeding may be accepted on the basis of purity and germination values shown on the seed bag. The Work of temporary seeding of erosive earth areas shall be done promptly at the locations and times directed. Rye grain, annual rye or winter wheat seed shall be used for temporary seeding. Rye grain shall not be used in areas to be planted with native vegetation.

2.2.3. Straw Mulch.

Refer to Section 9.2.5 of these Specifications.

2.2.4. Wood Cellulose Fiber Mulch.

Refer to Section 9.2.6 of these Specifications.

2.2.5. Mulch Anchoring.

Refer to Section 9.2.7 of these Specifications.

2.2.6. Stone Bags.

Stone bags shall meet the specifications given in the City of Shepherdsville Standard Drawing EF-03.

2.2.7. Sand Bags.

Sand bags shall meet the specifications given in the City of Shepherdsville Standard Drawing ED-01.

2.2.8. Silt Fence.

Silt fence shall meet or exceed the specifications of the City of Shepherdsville Standard Drawing EF-09.

2.2.9. Prefabricated Silt Fence.

Prefabricated silt fence shall meet or exceed the specifications given in the City of Shepherdsville Standard Drawing No. EF-09.

2.2.10. Reinforced Silt Fence.

Reinforced silt fence shall meet or exceed the specifications of the City of Shepherdsville Standard Drawing EF-10.

2.2.11. Prefabricated Reinforced Silt Fence.

Prefabricated reinforced silt fence shall meet or exceed the specifications given in the City of Shepherdsville Standard Drawing No. EF-10.

2.2.12. Geotextile Fabrics for Silt Fences.

Geotextile fabric shall meet or exceed the specifications given in the City of Shepherdsville Standard Drawings No. EF-09 and No. EF-10.

2.2.13. Hardwood Posts.

Hardwood posts shall meet the specifications given in the City of Shepherdsville Standard Drawing No. EF-09.

2.2.14. Steel Posts.

Steel posts shall be “U” shaped or “T” shaped posts that meet the requirements given in the City of Shepherdsville Standard Drawing No. EF-10

2.2.15. Steel Reinforcement Mesh.

Steel reinforcement mesh shall meet or exceed the specifications for reinforcing mesh given in the City of Shepherdsville Standard Drawing No. EF-10.

2.2.16. Synthetic Reinforcement Mesh.

Synthetic reinforcement mesh shall meet or exceed the specifications for reinforcing mesh given in the City of Shepherdsville Standard Drawing No. EF-10.

2.3 EXECUTION OF WORK

2.3.1 Site Preparation.

2.3.1.1 Rights-of-Way and Easements.

The Contractor shall confine his construction activities within the rights-of-way and/or easements shown on the Plans. The Contractor shall be responsible for obtaining written agreements for use of private property outside of his development or the City of Shepherdsville acquired easements

for such purposes as storage of material and equipment and access to the construction site. The private agreement shall be specific to the responsibilities of both parties and shall provide the City of Shepherdsville with indemnification and shall hold the City of Shepherdsville harmless. The Contractor shall provide a copy of all such written agreements to the City of Shepherdsville immediately upon obtaining same. Access shall not be made through areas or obstructions designated as "Do Not Disturb (DND)" or "Do Not Remove (DNR)" without prior approval by the City of Shepherdsville.

2.3.1.2 Temporary Construction Easements.

Temporary construction easement shall be used for access to the construction site and temporary storage of materials and/or equipment. The Contractor shall protect trees within the temporary easement where possible. Where damage to trees is unavoidable, the Contractor will be responsible for compensating property owners, obtaining written agreements with the property owners, and shall indemnify and hold the City of Shepherdsville harmless. The Contractor shall provide the City of Shepherdsville with a copy of all such written agreements prior to performing the Work. No borrow material can be removed from a temporary construction easement, nor can construction material be buried within a temporary construction easement, without the written consent of the City of Shepherdsville and property owner.

2.3.1.3 Limits of Disturbance.

The limits of disturbance define the areas in which construction operations are allowed. Construction activities include, but are not limited to; construction traffic, excavation, earth moving activities, stockpiling and staging activities.

2.3.1.4 Existing Obstructions.

Locations of obstructions shown on the Plans are approximate. They are shown only for information purposes and are not intended as an accurate location of such obstructions. Obstructions not shown on the Plans but encountered by the Contractor shall be removed as necessary and, if directed by the City of Shepherdsville, replaced in their original state or protected by the Contractor at no additional cost to the City of Shepherdsville.

2.3.1.5 Protection of Trees and Shrubs.

No existing trees or shrubs in rights-of-way and/or easements which are marked "Do Not Disturb (DND)" or "Do Not Remove (DNR)" on the Plans, shall be damaged or destroyed. Where branches of such trees or shrubs interfere with the Contractor's operations, they shall be protected by tying

back wherever possible. When possible, put up fencing or other barriers around trees to be protected.

When working around trees, the Contractor shall make every effort to save as many trees as possible by utilizing the following methods of construction .

- Make every effort not to cut or damage any root 2-inches or larger.
- When constructing a trench and roots are encountered, cut 2-inch diameter and larger roots with a clean saw flush with the sides of the trench.
- When roots 2-inches or larger are broken or split, dig out enough of the single trench side to saw through an undamaged portion of the root.
- Use a solution of chlorine bleach and water or a commercial solution to clean the saw before cutting next tree, to reduce the chance of spreading disease.
- In trenches where roots have been cut, backfill as soon as possible or keep all root ends moist with wet burlap, peat moss or similar material.
- Pile excavated soil on the side of the trench opposite the tree. If this procedure is not possible, place the soil on a plastic tarp, a sheet of plywood or a 4-inch thick bed of mulch outside the drip line of the tree to be protected.
- Do not dispose of cable scraps, oil cans, wood scraps, machine fluids, paint, left over concrete or any other debris in the backfill.
- The last 24-inches of backfill shall be compacted to original ground firmness, but no more.
- Water the backfill, until the last 24-inches of backfill is moist.
- Do not scrape or gouge any bark on trunks or lower limbs with equipment. Tie back lower limbs when possible.

Where equipment is working in confined space near trees, wrap the tree trunk in old tires or snow fence, or place 2-inch x 4-inch studs around the tree trunk and rope or band them in place.

- Protect valuable trees or groups of trees by erecting a fence at or just outside the dripline.
- Do not park or operate vehicles and/or equipment within the dripline of a tree unless the Mulch Method or the Bridge Method has been used.

- (A) Mulch Method Root Protection. Place a 12-inch thick layer of wood chips around the base of the tree that extends from the trunk beyond the baseline of the tree.
- (B) Bridge Method Root Protection. Place steel plates on railroad ties to bridge construction traffic over the tree's root zone to prevent soil compaction.
- When limbs are accidentally broken by equipment, remove the jagged edge by sawing at the broken limb's junction with the trunk or the next larger limb. Cut as close as possible without cutting into the branch collar, and follow other recommended pruning practices as outlined in "Pruning Trees Near Electric Utility Lines" by Dr. Alex L. Shigo. Do not paint the pruning wound. Remember to clean the saw blade before cutting the limb and before cutting on another tree.
 - Do not store materials within the dripline of a tree.
 - Do not add additional soil within the dripline of a tree.
 - Do not remove any soil within the dripline of a tree.

If the Contractor's operations will not permit saving certain trees marked "DND" or "DNR" on the Plans, the Contractor shall be wholly responsible for satisfying all claims for restoration or restitution resulting from their damage or removal. If the Work is within public rights-of-way in the City of Shepherdsville, the Contractor shall contact an arborist/forester before cutting or removing any trees affected by his Work and shall comply with the Forester's requirements. If the Work is within public rights-of-way in Bullitt County, the Contractor shall first contact an Arborist/Forester before cutting or removing any trees affected by his Work and shall comply with the Forester's requirements. Within the easement, the Contractor shall first advise the City of Shepherdsville and then shall replant or replace trees or shrubs with a species and size agreed by the property owners in writing, or the Contractor shall compensate the property owner for the loss. The Contractor shall provide the City of Shepherdsville with a copy of all written Agreements, with specific responsibilities detailed, prior to performing any Work, and shall hold the City of Shepherdsville harmless.

If trees and shrubs are moved or pruned, this Work shall be done in accordance with Home and Garden Bulletin No. 83, U.S. Department of Agriculture, "Pruning Shade Trees and Repairing Their Injuries". However, the Contractor shall obtain in writing and provide to the City of Shepherdsville the property owner's permission to move or prune trees or shrubs on the property. Trees and shrubs damaged by the Contractor's operations shall be repaired in accordance with said Bulletin No. 83. Any trees whose stumps will not be removed shall be ground out 6-inches below

the ground surface. All grindings shall be removed. Backfill with suitable material and revegetate appropriately.

Payment for protecting trees and shrubs shall be the obligation of the Contractor at no additional cost to the City of Shepherdsville.

2.3.1.6 Protection of Obstructions Outside Right-of-Way/Easement Limits.

The Contractor shall protect and avoid damage to all trees, shrubs, plants fences, turfed areas, structures and all other objects outside the right-of-way/easement limits shown on the Plans and right-of-way/easement plats from damage due to construction operations. Damage caused by the Contractor shall be repaired or restored at no additional cost to the City of Shepherdsville. Particular care shall be used to avoid damage to trees, shrubs, bushes, turfed areas, and private property located adjacent to rights-of-way/easements on private property. No trees, plants, turfed areas, or other objects outside such limits shall be disturbed or damaged without the written permission of the property owner. The Contractor shall provide the City of Shepherdsville a copy of all written agreements prior to performing any Work, and shall hold the City of Shepherdsville harmless.

2.3.1.7 Special Protection of Obstructions Inside Easement Limits.

Wherever the installation of sanitary or storm drainage facilities conflicts with other improvements previously made by other agencies, utility companies, governmental bodies, or adjacent property owners, then the Contractor shall be responsible for their protection and preservation, including necessary removal and storage of such improvement, and subsequent replacement to obtain, to the fullest extent possible, the undisturbed condition.

2.3.1.8 Clearing and Grubbing.

Sediment control devices as required by the Erosion Prevention and Sediment Control Plan shall be in place before clearing and grubbing is performed. Those areas contained within the rights-of-way and/or easements shown on the Plans and which will be excavated or used for embankment shall be cleared of trees, stumps, brush, projecting roots, hedges, weeds, logs, and other protruding obstructions, except for trees and shrubs marked "Do Not Disturb". All trees, stumps, roots, brush, hedge, and other protruding obstructions within the rights-of-way/easements that are to be removed shall be cut to within 3 inches of existing ground. The area shall be grubbed to a minimum depth to 6 inches below existing grade to remove grass, roots, and other organic material. This Work shall be done well in advance of earthwork operations in accordance with the Erosion Prevention and Sediment Control Plan.

2.3.1.9 Removal of Obstructions and Pavements.

Existing fence material and posts within the right-of-way/easement limits shown on the Plans and right-of-way/easement plats shall be moved from the construction area and stored in such a manner as to protect them against damage. The Contractor shall be responsible for the condition of the removed fence material and posts. The Contractor shall demolish and remove all structures and structure foundations within the right-of-way/easement limits unless otherwise directed by the City of Shepherdsville. Such structures and foundations shall be removed to 24 inches below grade or as directed by the City of Shepherdsville. The Contractor shall protect and avoid damage to existing structures when they are to be relocated as directed by the City of Shepherdsville. The Contractor shall remove all abandoned vehicles, appliances, and rubbish within the right-of-way/easement limits.

Cuts in all existing pavements shall be made along straight saw cut lines parallel with each edge of the trench or structure. If directed by the City of Shepherdsville, cuts in concrete pavements or sidewalks shall be to the nearest construction joint. Cuts in existing curb and gutter shall be made to straight lines perpendicular to the alignment of the curb.

2.3.1.10 Disposal of Debris.

All trees, brush, logs, leaves, construction debris, and refuse shall be collected and disposed of in accordance with all applicable codes and ordinances. Debris shall be removed from the site as soon as practical. Unless otherwise provided in the Contract, the Contractor shall make his own arrangements for disposing of such material off-site. All disposal plans must be approved by the City of Shepherdsville.

2.3.1.11 Topsoiling.

Unless otherwise directed by the City of Shepherdsville or shown on the Plans, topsoil shall be stripped from Project areas to be graded and stockpiled for later use at no additional cost to the City of Shepherdsville.

- (A) Topsoil Stripping: Strip 4 inches (minimum) of topsoil only from those areas that will be disturbed by excavation, filling, road building, or compaction by equipment. Topsoil stripping is a construction activity. Sediment controls shall be installed prior to the start of topsoil stripping in any area.
- (B) Topsoil Stockpiling: Select stockpile location(s) to avoid slopes, floodplains and natural drainage ways. Do not place stockpiles near bodies of water or traffic routes. Install sediment barriers (silt fence

or straw bale sediment barrier) as necessary to retain sediment from stockpiles. Protect topsoil stockpiles with temporary stabilization when they will not be utilized for thirty (30) days or more. If stockpiles are not to be used within twelve (12) months, they shall be permanently stabilized to control erosion and weed growth.

2.3.1.12 Temporary Fencing used to Contain Livestock/Domestic Animals.

All temporary fencing erected to contain livestock or domestic animals shall be constructed in such a manner as to maintain a level of closure as good as or better than that which existed prior to construction. The Contractor shall examine all such temporary fencing daily to ensure that all livestock or domestic animals are sufficiently contained.

2.3.1.13 Replacement of Fences.

Any fences disturbed within right-of-way/easement limits shall be replaced to the satisfaction of the Engineer at no additional cost to the City of Shepherdsville. Fences in such poor condition that they cannot be removed and replaced shall be replaced with fence material similar in original quality, size, and appearance to the removed fence, or a written release shall be obtained from the property owner and a copy provided to the City of Shepherdsville.

2.3.2 Erosion Prevention

2.3.2.1 Temporary Soil Stabilization

- (A) Preparing the Seed Bed. Areas to be temporarily seeded shall require the preparation of a seed bed only when the soil surface is desiccated, is non-uniform, or contains clods of large stones. Disturbance of the soil surface by whatever means that is practicable, such as disking, to create a 2 inch thick loose and roughened condition capable of retaining the seed and mulch will be required when the soil surface is desiccated or non-uniform. Clods and stones larger than 2 inches shall be removed. The preparation of a seed bed will not be required when the soil surface is in an acceptable condition from the normal grading operations.
- (B) Seeding. Temporary seeding shall be permitted only during the periods indicated in the table below. In order to stabilize erodible areas with vegetation through the winter, temporary seeding must be completed no later than October 31. Working the soil to cover the seed will not be required. Temporary seeding shall be sown at the approximate rate of 3 pounds per 1000 square feet.

<u>Work Item</u>	<u>Accepted Work Interval</u>
Temporary Seeding with Annual Rye	March 1 through November 1
Temporary Seeding with Winter Wheat or Rye Grain	September 1 through November 1

- (C) Protection. All seeded areas shall be promptly protected with straw mulch or wood cellulose fiber mulch. The materials shall be uniformly applied and anchored to the seeded areas in accordance with Section 9.2 of these Specifications.
- (D) Dormant Season Stabilization. Areas requiring temporary stabilization during the period of November through February, when seeding is not permitted, shall receive only an application of straw mulch held in place by crimping or netting. The approximate rate of application of the straw mulch shall be 3 tons per acre.

2.3.2.2 Temporary Stabilization of Waterways.

Erosion control blankets for temporary stabilization of waterways shall be the equivalent of the temporary blanket specified for permanent stabilization of the waterway. In waterways where erosion control blankets are not specified for permanent stabilization, or a permanent erosion control mat is specified for permanent stabilization, the erosion control blanket for temporary stabilization shall be that specified on the Erosion Prevention and Sediment Control Plan or by the City of Shepherdsville. The blankets shall be installed in accordance with Section 9 of these specifications.

2.3.2.3 Flow Diversions.

Temporary diversions for runoff from undisturbed areas shall be constructed in accordance with Erosion Control Plan.

- (A) Installation: Temporary diversions shall be constructed according to the sections and on the alignment and grade shown on the Erosion Prevention and Sediment Control Plan. Install diversions in the sequence specified on the Erosion Prevention and Sediment Control Plan or as directed by the City of Shepherdsville.
- (B) Inspection and Maintenance: Temporary diversions shall be inspected and maintained in strict accordance with the Erosion Control Plan.
- (C) Removal: Remove temporary diversions in accordance with the requirements of the Erosion Prevention and Sediment Control Plan.

2.3.2.4 Outlet Stabilization

- Level Spreader. Level spreaders shall be constructed in accordance with the Erosion Prevention and Sediment Control Plan.
 - A. Installation: Level spreaders shall be constructed according to the sections and on the alignment and grade shown on the Erosion Prevention and Sediment Control Plan.
 - B. Inspection and Maintenance: Level spreaders shall be inspected and maintained in strict accordance with the Erosion Prevention and Sediment Control Plan.
 - C. Removal: Remove level spreaders in accordance with the requirements given in the Erosion Prevention and Sediment Control Plan.
- Culvert Outlet Protection. Culvert aprons and headwalls shall be constructed in accordance with Section 5.3 of these Specifications.

2.3.2.5 Temporary Stream Crossings.

All temporary stream crossings shall be done in accordance with the Kentucky Stream Crossing Permit from the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water. Stream banks shall be permanently or temporarily stabilized within 14 days of initial streambank disturbance. Copies of all applicable permits shall be kept at the job site. Temporary stream crossings shall be built in accordance with the approved Erosion Prevention and Sediment Control Plan prior to using the crossing.

- (A) Long-Term Stream Crossings: For locations where a crossing will be used for access, a bridge or a pipe system shall be installed in accordance with Standard Drawing No. ER-02 to prevent personnel, equipment and material from disturbing the stream with each crossing. Bridges and culverts shall be constructed to the dimensions given in the Erosion Prevention and Sediment Control Plan. Visible build-up of silt and mud in the creek will be cleaned out on a regular basis and appropriate measures shall be taken to stabilize the crossing and prevent further erosion according to Standard Drawing No. ER-02 and the Erosion Prevention and Sediment Control Plan.

Pump-around flow diversion shall be established prior to any construction activity in the stream in accordance with Standard Drawing No. ED-01. Flow diversion is not required when the stream is dry for the duration of construction activities in the stream.

- (B) Short-Term Stream Crossings: For locations where a crossing is not used for access, streambank disturbance shall be kept to the minimum required to construct the pipeline stream crossing. Pump-around flow diversion in the stream (in accordance with Standard Drawing No. ED-01) shall be established in the stream prior to the start of any construction activities in the stream and shall be maintained until construction and stabilization (permanent or temporary) are complete. Flow diversion is not required when the stream is dry.

2.3.2.6 Surface Roughening

Surface roughening, including tracking, stair-step grading, and slope grooving shall be performed at the locations shown on the Erosion Prevention and Sediment Control Plan in accordance with Standard Drawing Nos. EC-04-01, EC-05-01 and EC-06-01.

2.3.3 Sediment Control

2.3.3.1 General.

The Contractor shall exercise every reasonable precaution at all times to prevent water pollution by the deposition of sediment in streams, lakes, and reservoirs. He shall conduct and schedule his operations so as to avoid or minimize the muddying or siltation of areas adjacent to the construction site including streets, storm sewers, vacant lots, etc. The Contractor shall comply with the applicable provisions of KRS Chapters 220 and 224 of the State Water Pollution Control Laws and other applicable statutes relating to the prevention or abatement of water pollution.

2.3.3.2 Silt/Velocity Ditch Checks.

Silt/velocity ditch checks shall be constructed using stone-filled bags in accordance with Standard Drawing No. EF-12.

- (A) Installation: Silt/velocity checks shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction on areas that drain to the check location.
- (B) Inspection and Maintenance: Silt/velocity checks shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. EF-12.
- (C) Removal: Remove silt/velocity checks in accordance with the requirements given in Standard Drawing No. EF-12. Checks temporarily removed to facilitate construction activities shall be replaced immediately following completion of such activity.

2.3.3.3 Silt Fence.

Where called for on the Erosion Prevention and Sediment Control Plan or the Project Plans and Specifications, silt fence shall be installed, inspected, maintained, and removed in accordance with the requirements given in Standard Drawing No. EF-09.

- (A) Installation: Silt fence shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction on areas that drain to the fence location.
- (B) Inspection and Maintenance: Silt fence shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. EF-09.
- (C) Removal: Remove silt fence in accordance with the requirements given in Standard Drawing No. EF-09. Silt fences temporarily removed to facilitate construction activities shall be replaced immediately following completion of such activity.

2.3.3.4 Reinforced Silt Fence.

Where called for on the Erosion Prevention and Sediment Control Plan or the Project Plans and Specifications, reinforced silt fence shall be installed, inspected, maintained, and removed in accordance with the requirements of Standard Drawing No. EF-10.

- (A) Installation: Reinforced silt fence shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction activities on areas that drain to the fence location.
- (B) Inspection and Maintenance: Reinforced silt fence shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. EF-10.
- (C) Removal: Remove reinforced silt fence in accordance with the requirements given in Standard Drawing No. EF-10. Silt fences temporarily removed to facilitate construction activities shall be replaced immediately following completion of such activity.

2.3.3.5 Stabilized Temporary Construction Entrances.

Stabilized temporary construction entrances shall be constructed in accordance with Standard Drawing No. ER-01.

- (A) Installation: Stabilized temporary construction entrances shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to accessing the construction site.
- (B) Inspection and Maintenance: Stabilized temporary construction entrances shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. ER-01.
- (C) Removal: Remove stabilized temporary construction entrances in accordance with the requirements given in Standard Drawing No. ER-01. Stabilized entrances temporarily removed to facilitate construction activities shall be replaced immediately following completion of such activity.

2.3.3.6 Stone Bag Inlet Protection for Drop Inlets.

Stone bag inlet protection for drop inlets shall be constructed in accordance with Standard Drawing No. EF-03.

- (A) Installation: Stone bag inlet protection shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction activities on areas that drain to the inlet, or immediately following the time at which a new inlet can receive runoff from a disturbed area. The Contractor shall not use Stone Bag Inlet Protection in areas where traffic could be impacted.
- (B) Inspection and Maintenance: Stone bag inlet protection shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. EF-03.
- (C) Removal: Remove stone bag inlet protection in accordance with the requirements given in Standard Drawing No. EF-03. Inlet protection temporarily removed to facilitate construction activities shall be replaced immediately following completion of such activity.

2.3.3.7 Filter Fabric Inlet Protection for Drop Inlets.

Filter fabric inlet protection for drop inlets shall be constructed in accordance with Standard Drawing No. EF-01.

- (A) Installation: Filter fabric inlet protection shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction activities on areas that drain to the inlet, or immediately following the time at which a new inlet can receive runoff from a disturbed area.

- (B) Inspection and Maintenance: Filter fabric inlet protection shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. EF-01.
- (C) Removal: Remove stone bag inlet protection in accordance with the requirements given in Standard Drawing No. EF-01. Inlet protection temporarily removed to facilitate construction activities shall be replaced immediately following completion of such activity.

2.3.3.9 Stone Bag Inlet Protection for Curb Inlets.

Stone bag inlet protection for curb inlets shall be constructed in accordance with Standard Drawing No. EF-04.

- (A) Installation: Stone bag inlet protection for curb inlets shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction activities on areas that drain to the inlet, or immediately following the time at which a new inlet can receive runoff from a disturbed area.
- (B) Inspection and Maintenance: Stone bag inlet protection shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. EF-04.
- (C) Removal: Remove stone bag inlet protection in accordance with the requirements given in Standard Drawing No. EF-04. Inlet protection temporarily removed to facilitate construction activities shall be replaced immediately following completion of such activity.

2.3.3.11 Stone Bag Inlet Protection at Headwalls.

Stone bag inlet protection at headwalls shall be constructed in accordance with Standard Drawings EF-05, EF-06, and/or EF-07.

- (A) Installation: Stone bag inlet protection at headwalls shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction activities on areas that drain to the headwall, or immediately following the time at which a new headwall can receive runoff from a disturbed area.
- (B) Inspection and Maintenance: Stone bag inlet protection shall be inspected and maintained in strict accordance with the requirements given in Standard Drawings EF-05, EF-06, and/or EF-07.

- (C) Removal: Remove stone bag inlet protection in accordance with the requirements given in Standard Drawings EF-05, EF-06, and/or EF-07. Inlet protection temporarily removed to facilitate construction activities shall be replaced immediately following completion of such activity.

2.3.3.12 Temporary Sediment Traps.

Temporary Sediment traps shall be constructed in accordance with Standard Drawing No. EB-01.

- (A) Installation: Temporary Sediment traps shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction activities on areas that drain to the trap.
- (B) Inspection and Maintenance: Temporary Sediment traps shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. EB-01.
- (C) Removal: Remove temporary sediment traps in accordance with the requirements given in Standard Drawing No. EB-01.

2.3.3.13 Temporary Sediment Basins.

Temporary Sediment basins shall be constructed in accordance with Standard Drawing No. EB-02.

- (A) Installation: Temporary Sediment basins shall be installed at the locations shown on the Erosion Prevention and Sediment Control Plan prior to the start of construction activities on areas that drain to the basin.
- (B) Inspection and Maintenance: Temporary Sediment basins shall be inspected and maintained in strict accordance with the requirements given in Standard Drawing No. EB-02.
- (C) Removal: Remove Temporary sediment basins in accordance with the requirements given in Standard Drawing No. EB-02.

2.3.3.14 Diversions for Sediment-Laden Water.

Temporary diversions shall be constructed in accordance with the Erosion Prevention and Sediment Control Plan.

- (A) Installation: Temporary diversions shall be constructed according to the sections and on the alignment and grade shown on the Erosion Prevention and Sediment Control Plan. Install diversions in the sequence specified on the Erosion Prevention and Sediment Control Plan or as directed by the City of Shepherdsville.
- (B) Inspection and Maintenance: Temporary diversions shall be inspected and maintained in strict accordance with the requirements given in the Erosion Prevention and Sediment Control Plan.
- (C) Removal: Remove temporary diversions in accordance with the requirements given in the Erosion Prevention and Sediment Control Plan.

2.4. EROSION PREVENTION AND SEDIMENT CONTROL PLAN

2.4.1 General.

Construction shall conform to all requirements of the Erosion Prevention and Sediment Control Plan as provided in the specifications or all other applicable specifications and the Contract Documents.

2.4.2 Certification.

For all City of Shepherdsville projects, the Contractor and all Subcontractors shall sign a certification statement, as required by the KPDES General Permit KYR 100000. This statement will be held in the City of Shepherdsville's project file.

2.4.3 Revisions.

Revisions to the Erosion Prevention and Sediment Control Plan must be approved by the City of Shepherdsville. All revisions must be shown on the EPSC Plan.

2.4.4 Spill Prevention, Control, and Countermeasures (SPCC) Plan.

The Contractor and Subcontractors shall be responsible for obtaining and implementing SPCC Plans for petroleum products and hazardous materials stored on the job site as required by National Oil Pollution Prevention (NOPP) Regulations. If petroleum products are stored in containers with capacity in excess of 660 gallons, the storage tanks are regulated by NOPP regulations and an SPCC plan is required.

SECTION 3

CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS

EARTHWORK

3.1 DESCRIPTION OF WORK

This Work shall consist of excavations, backfilling of excavations, construction of embankments, and grading for all types of sanitary and storm drainage facilities, and all other items as may be necessary to complete the earthwork as shown on the Plans, in the Contract, or as directed by the City of Shepherdsville.

3.2 MATERIALS

3.2.1 Crushed Stone

Crushed stone used to stabilize and backfill excavations shall be coarse aggregate conforming to Size No. 57 as set forth in Section 805 of the KTC Specifications and shall be free from sharp, angular pieces which could, in the judgment of the City of Shepherdsville, cause damage to the pipe.

3.2.2 Sand

Sand for backfill placed in accordance with Section 3.3.4.2 (A) herein referred to as Type 1-A backfilling shall be comprised of sand or sand-gravel mixtures containing less than 30 percent passing a No. 40 sieve and less than 5 percent passing a No. 200 sieve. Sand or sand-gravel mixtures shall classify as SW, SP, or GW, and shall have a uniformity coefficient of 4.5 or more, as set forth in ASTM D 2487, Standard Specification for Classification of Soils for Engineering Purposes. Sands which have a coefficient of uniformity less than 4.5 but greater than or equal to 1.5 will be permitted, but placement and compaction shall be in accordance with Section 3.3.4.2.(B). These sands are referred to as Type 1-B backfill.

The Contractor shall provide a Certification of Compliance stating that the sand fully complies with the requirements stated herein. In addition, the Contractor shall provide the results of the sieve analysis, including a graph depicting the percent finer versus particle size and the uniformity coefficient.

Sand used on the basis of Certificates of Compliance may be sampled and tested by the agency designated by the City of Shepherdsville at any time and, when found not to be in conformity, will be subject to rejection, whether in place or not. Should the test results show the sand to not meet the requirements stated herein, then the Contractor shall assume the full cost of the testing, removal of the undesirable

material, replacement of the materials and other Work resulting from the removal of the undesirable material and replacement by acceptable material.

3.3 Execution of Work

3.3.1 General

Prior to beginning earthwork operations, all necessary clearing, grubbing, removal of obstructions and pavements, and installation of required sediment control facilities shall have been completed in accordance with Section 2 of these Specifications. Rough grading and restoration shall be maintained within a maximum distance of 1,500 L.F. of the active disturbance, with logical limits between structures, unless otherwise approved by the City of Shepherdsville.

The Contractor shall at all times be responsible for the condition of the trenches and filled areas. He shall maintain frequent inspection of same, and if at any time before the final acceptance of the Work by the City of Shepherdsville, the trenches or filled areas settle or sunken areas appear, he shall be required to refill these sunken areas with suitable material as soon as they are discovered. Barricades are to be closely spaced to provide a nearly continuous protection. All trenches shall be barricaded and caution-lighted or covered with steel trench plates at all times for the protection of the public.

3.3.2 Excavation

3.3.2.1 Classification

Without regard to the materials encountered, all excavation shall be unclassified. It shall be distinctly understood that reference to rock, earth, or any other material on the Plans or in the Contract, whether in numbers, words, letters, or lines, is solely for the City of Shepherdsville's information and is not to be taken as an indication of classified excavation or the quantity of either rock, earth, or any other material involved.

The Contractor must draw his own conclusions as to the conditions to be encountered. The City of Shepherdsville does not give any guarantee as to the accuracy of the data and no claim will be considered for additional compensation when the materials encountered are not in accord with the classification shown. In the event contaminated materials are encountered, the Contractor shall cease Work and immediately contact the appropriate agencies, including the City of Shepherdsville, in accordance with Section 3.3.3.2.

Blasting shall be performed at a safe distance ahead of the installation of the pipes and structures to prevent damage as the shots are fired. Blasting of rock for property service connections, branches, and stubs shall be performed concurrent with the trench blasting. The rock at the ends of all pipes, branches, stubs and property service connections, shall be shattered by continuing the blasting operations approximately 6 feet beyond the end of the

pipe for property service connections provided consent and release has been obtained by the City of Shepherdsville and approximately one full joint of pipe beyond the manhole or the end of the main line sewer. Sufficient explosive shall be used to shatter the rock to allow for future excavation. To prevent damage to installed sewers or structures, concrete for walls, footings, or encasements shall not be poured in direct contact with bedrock unless otherwise shown on the Plans or directed by the City of Shepherdsville.

The blasting of rock under existing paving, prior to uncovering the rock, may be permitted provided the Contractor assumes full responsibility for all damage to the existing paving. The City of Shepherdsville reserves the right to require the uncovering of rock prior to blasting if blasting without uncovering proves unsatisfactory.

If the Contractor chooses to shoot rock under paving without uncovering the rock, the Contractor shall immediately repair humps in the paving that create a traffic hazard. All distortions outside the limits of the trench caused by the blasting shall later be removed and replaced as part of the paving restoration.

After the blast is fired, the Contractor shall thoroughly scale the excavation. All loose, shattered rock or other loose material, which may be dangerous to the workmen, pipe, or structure, shall be removed and the excavation made safe before proceeding with the Work. The fact that the removal of loose, shattered rock or other loose material may enlarge the excavation beyond the required width will not relieve the Contractor from making such removal and filling the extra space. If rock is excavated beyond the trench width indicated on the City of Shepherdsville's Standard Drawings, such unauthorized excavation, or over breakage, shall be refilled with crushed stone in the pipe zone the remaining backfill will be per section 3.3.4 or Class B concrete in ditches and streams, at no additional cost to City of Shepherdsville. Remove all blasting debris to ensure public and Contractor's safety.

3.3.3 Earth Materials

3.3.3.1 Selected Excavated Material

This material shall consist of earth removed from excavations and used for backfill. It shall be free from rubbish, organic matter, frozen soil, muck, and other perishable, compressible debris that prevent compaction of the material to a dense, uniform state. Rock and other hard, durable fragments shall be limited to the particle sizes described in Section 3.3.4., with adequate fines to fill all voids, and shall be uniformly distributed through the material.

3.3.3.2 Unsuitable Contaminated Materials

For City of Shepherdsville Capital Improvement Projects, the City of Shepherdsville-or in some instances the property owner-shall be responsible for any asbestos, PCB's, petroleum, hazardous waste or radioactive material uncovered or revealed at the site, which was not shown or indicated in the City of Shepherdsville Capital Improvement Project Plans or identified in the Contract to be within the scope of the Work and which may represent a substantial danger to persons or property exposed thereto in connection with the Work site. Once a problem is identified, Work shall stop until the course of action can be determined by the City of Shepherdsville. It shall then be up to the City of Shepherdsville to participate in paying additional costs for hauling and disposal at a landfill or appropriate facility or cost of testing as delineated further within these specifications.

City of Shepherdsville is NOT responsible for any such materials brought to the site by the Contractor, sub-Contractor, suppliers, or anyone else for whom the Contractor is responsible.

If unsuitable contaminated materials are encountered, the Contractor shall take the following action:

- (A) The Contractor shall immediately stop all Work in connection with such hazardous condition and notify the City of Shepherdsville inspector (and thereafter confirm in writing such notice to the City of Shepherdsville City Engineer.
- (B) The Contractor shall then be responsible for making notification to "911" (Emergency Response) in the event of discovery of a release of contaminated material.
- (C) The Contractor is responsible for making notification to the Kentucky Department for Environmental Protection at (502) 564-2380 or 1-800-928-2380.
- (D) The Contractor is responsible for securing the Work site to prevent access by unauthorized personnel.

NOTES: The above notices should include the precise location, the suspected material type, and the approximate quantity and concentration if known.

IF MATERIALS ARE HAULED WITHOUT NOTICE, IT SHALL BE THE PROPERTY OF THE CONTRACTOR. THE CITY OF SHEPHERDSVILLE WILL NOT PAY FOR DISPOSAL OR ASSOCIATED ADDITIONAL COSTS.

The Contractor shall not be required to resume Work in connection with such condition until the City of Shepherdsville and/or the owner of the property has obtained any required permits for disposal of the unsuitable materials. The City of Shepherdsville 's engineer shall promptly determine the means and methods to evaluate such condition or take corrective action on a case-by-case basis. This action could involve realignment or other design changes. The City of Shepherdsville will provide the Contractor special written notice specifying that the condition is rendered safe for the resumption of Work, or specifying any special conditions under which the Work may be resumed. The cost of sampling and lab testing will be the responsibility of the City of Shepherdsville. The City of Shepherdsville will also be responsible for substantiated additional costs for disposal such as receiving fees at the local landfill or additional hauling fees.

The Contractor shall resume such Work based on special conditions or the City of Shepherdsville may order such portion of the Work that is in connection with hazardous condition to be deleted from the Work according to the unit price of the Contract. The City of Shepherdsville may choose to perform the deleted portion of the Work with its own forces or make such provisions as necessary to complete that portion of the Project.

3.3.3.3 Stockpiling Excavated Materials

The Contractor shall be responsible for determining the limits of stockpiles in relation to excavations and maintaining such limits to prevent excessive loads on the sides of excavations or sheeting and bracing systems. In addition, excavated materials to be used for backfill shall be stored no closer than 2 feet from the edge of the excavation to allow free passage of the City of Shepherdsville's Engineer and permit the City of Shepherdsville's Engineer to perform his Work in an expeditious and safe manner. Excavated material shall not obstruct crosswalks, sidewalks, street intersections, nor interfere unreasonably with travel on streets by occupants of adjoining property. Gutters or other surface drainage facilities shall not be obstructed. When clear access to fire hydrants, mail boxes, sewer or conduit manholes, and similar utilities or municipal service facilities is required, the Contractor must provide such access. All Work shall conform to the Kentucky Occupational Safety and Health Program and Section 29 CFR 1926, Subpart P, "Trenching and Shoring."

3.3.3.4 Wasting Excavated Materials

All materials excavated by the Contractor and not to be used for backfilling trenches, channels, or structure excavations or to be used in restoration of the ground surface, shall be removed from the site and disposed of by the Contractor at a pre-approved site, unless otherwise specified in the Contract. The City of Shepherdsville reserves the right to retain excess excavated

materials and direct the Contractor to deliver it to a site specified by the Contract at the Contractor's expense. When the Contractor proposes to waste unsuitable or excess excavated material upon any privately-owned property, written consent from the property owner must be secured in advance and a copy provided to the City of Shepherdsville prior to scheduling the Work. All filling operations must be approved by the City of Shepherdsville. No surplus or unsuitable materials shall be deposited in any stream channel or in any place where pre-construction surface drainage would be changed without written permission from the City of Shepherdsville.

3.3.3.5 Sheeting and Bracing and Trench Boxes

The Contractor shall furnish, place and maintain adequate sheeting and bracing or trench boxes as may be required to support the sides of the excavation and prevent any movements of earth which could, in any way, diminish the width of the excavation to less than that necessary for proper construction, cause damage to the sewer or structure being constructed or to adjacent structures, utilities, pavements or walks, or cause injury to workmen or others through movement of the adjacent earth banks, or to otherwise damage or delay the Work. All Work shall conform to the Kentucky Occupational Safety & Health Program and Section 29 CFR 1926, Subpart P, "Trenching and Shoring."

Sheeting and bracing or trench boxes shall be of wood or steel and shall be of adequate strength for excavation. Wherever possible, the sheeting and bracing shall be driven ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting, care shall be taken to avoid trimming behind the face along which the sheeting will be driven. Care shall be taken to prevent voids outside the sheeting, but if voids develop, they shall be immediately filled with sand backfill and densified by flushing and jetting with water. Where drop inlets, stacks or other appurtenances are constructed, the trench excavation shall be offset, as required, without additional compensation.

Sheeting left in place shall be cut off at least 18 inches below the ground surface and the cutoff material shall be removed from the excavation. All voids created by cutting off the sheeting shall be immediately filled with sand backfill and densified by flushing and jetting with water. Sheeting and bracing specified to be left in place as shown on the Plans or as ordered by City of Shepherdsville shall be paid for by City of Shepherdsville. Sheeting and bracing left in place at the Contractor's option, shall be at his expense.

All sheeting, bracing, and shoring which are not left in place under the foregoing provisions shall be removed in a manner which will not endanger the completed Work or other structures, utilities, sewers, or property whether, public or private. The Contractor shall exercise care to prevent the opening

of voids during the extraction process. Any voids created while pulling sheeting and bracing shall be immediately filled with sand backfill and densified by flushing and jetting with water.

3.3.3.6 Trench Dimensions

No more than 300 feet of trench in unpaved areas and 100 feet of trench in paved areas shall be opened at any time in advance of the pipe, nor shall more than 100 feet be left unfilled except by written permission from the City of Shepherdsville. In special cases, the City of Shepherdsville may limit the distance to which the trench may be open by notifying the Contractor in writing. Excavations for pipe in both earth and rock trenches shall display a width between the minimum and maximum allowable width, below a level 1 foot above the outside top of the pipe, as shown on the City of Shepherdsville's Standard Drawings. If the maximum allowable trench width is exceeded, a higher strength classification of pipe may be required, at no additional cost to the City of Shepherdsville.

Trench excavations for cast-in-place concrete sewers and structures shall have the minimum width necessary, as determined by the Contractor, for proper and safe construction. Trenches shall be excavated to a subgrade depth of six inches below the outside of the pipe, unless unsuitable foundation materials are encountered at the subgrade level.

3.3.3.7 Unsuitable Foundation

Unsuitable foundation materials shall consist of soft, spongy earth, mud, unconsolidated fill, organic matter, or any other materials that will not, in the opinion of the City of Shepherdsville, provide suitable support. The City of Shepherdsville may order extra Work performed when the bottom of the excavation is unsuitable. It shall be undercut below the subgrade level, to a depth approved by the City of Shepherdsville, and backfilled with crushed stone or other approved backfill material. Class B concrete shall be used to backfill the undercut zones in ditches and streams. At the City of Shepherdsville's direction, on City of Shepherdsville funded Projects, payment shall be made for removal or replacement of unsuitable material within the first 2 feet below the subgrade level.

If the unsuitable material is mud or muck caused by the activity of the Contractor or by his failure to provide adequate drainage for the excavation, no payment shall be made for the removal or replacement of such material.

3.3.3.8 Drainage of Excavations

The Contractor shall maintain all excavations free of water. He shall provide all dams, flumes, channels, sumps, or other Works necessary to keep the

excavation entirely clear of water and shall provide and operate pumps or other suitable equipment of adequate capacity for dewatering the excavations. He shall avoid producing mud in the trench or channel bottom by his operations. If necessary or so directed by the City of Shepherdsville, the Contractor shall place crushed stone at his own expense to maintain a firm, dry excavation bottom and base. Pipe bedding, laying, jointing, and the placing of concrete shall be done in a water-free trench or excavation. The water shall be disposed of at the Contractor's expense.

Where the excavation extends below the water table, and lowering of the water table is necessary to prevent excessive inflows and maintain stability within the excavation, dewatering shall be performed. The Contractor shall use well points, sump pumps, or any other method of dewatering as required to lower the water table below the bottom of the excavations in a manner that will prevent saturated soil from flowing into open trenches, shafts, structures and tunnels, and render such excavations firm until the structures to be built therein are completed. The Contractor shall obtain the City of Shepherdsville's approval prior to the use of special dewatering equipment other than well points or sump pumps. Dewatering operations are considered incidental to the Work and no additional compensation shall be made to the Contractor. The groundwater shall not be allowed to rise until the backfilling operations are complete. The Contractor shall be responsible for preventing pipe flotation.

Prior to beginning the Work, the Contractor shall obtain, at his expense, a water withdrawal permit from the Commonwealth of Kentucky, Department of Natural Resources and Environmental Protection Cabinet (KNREPC) in accordance with the following criteria:

- (A) Where the average withdrawal rate is more than ten thousand gallons per day (10,000 gal/day), a permit shall be required, except as exempted by KRS 151.140.
- (B) Where the withdrawal of water is made at a relatively constant rate each day and the average withdrawal rate is ten thousand gallons per day (10,000 gal/day), or less, no permit will be required.
- (C) Where withdrawals are made on an irregular basis at an irregular rate, permits may be required where the Division of Water determines that the water withdrawn represents a significant portion of the available water supply or that collection of withdrawal data is necessary for water resource planning purposes.

The Contractor shall assume all responsibility for claims resulting from damage to any land, wells, structures or improvements due to his dewatering operations.

Prior to any point discharge into a blue line stream or intermittent blue line stream, the Contractor shall obtain necessary permits from the Kentucky Division of Water and provide a copy to the City of Shepherdsville.

Point discharge operations are considered incidental to the Work and no additional compensation shall be made to the Contractor.

3.3.3.9 Blasting and Hoe-Ramming

When blasting is required to excavate rock, the Contractor shall comply fully with the provisions of the Laws and Regulations Governing Explosives and Blasting, as issued by the Kentucky Department of Mines and Minerals, and the Kentucky Occupational Safety and Health Standards for the Construction Industry, Subpart U, Blasting, as issued by the Kentucky Labor Cabinet.

Prior to any blasting or hoe-ramming operations, a pre-blast survey of potentially affected homeowners and properties shall be conducted by the Contractor or his agent. The Contractor shall provide the City of Shepherdsville with the name of the agency and person(s) who will be performing the survey. All appointments for surveys shall be made in advance by the Contractor or his agent. The City of Shepherdsville will provide the person(s) performing the pre-blast survey an original letter of introduction to identify them to the residents on Capital Improvement Projects. No copies of the letter shall be permitted.

The property owner(s) will be notified of the above procedure for the pre-blast survey by the Contractor or his agent. The affected property owners will be instructed by the Contractor to only accept an original letter of introduction on the City of Shepherdsville's letterhead. The Contractor shall furnish, upon request, all photographs taken and reports made during the pre-blast and post-blast surveys relating to any private property owner's damage claims, without any additional cost to the City of Shepherdsville.

No blasting or hoe-ramming shall be done unless proper insurance has been secured and is in force. Except with written permission by the City of Shepherdsville, no blasting of rock, or hoe-ramming, will be permitted at nights or on Sundays.

During blasting operations, every precaution shall be used for the protection of persons and private and public property. Each blast shall be well covered with mats and other suitable means to confine the rock fragments. Only the minimum amounts of explosives shall be used to shatter the rock. The Contractor shall monitor the blasts to ensure that excessive charges are not being used. The debris from the blasting operations shall be disposed of properly, in accordance with Department of Mines and Minerals Standards.

3.3.3.10 Borrow Material

Borrow material used as backfill or embankment shall be approved for such use by the City of Shepherdsville. The Contractor shall not use borrow material from the permanent or temporary construction easement without the written consent of the City of Shepherdsville. Prior to its use, the Contractor shall identify the source and provide samples for soil classifications and moisture-density tests. Borrow material shall meet the following requirements:

- (A) Unless otherwise permitted by the City of Shepherdsville, borrow material shall not be comprised of soils represented by the following classifications, as determined in accordance with ASTM D 2487: MH, CH, OL, OH, or Pt.
- (B) The borrow material shall be free from rubbish, organic matter, frozen soil, muck or other perishable, compressible debris, which prevent compaction to a dense, uniform state. Rock and other hard, durable fragments shall be limited to particles displaying a maximum dimension of 4 inches, shall not exceed 10 percent of the total volume, and shall be uniformly distributed throughout the material.
- (C) The maximum dry density of the borrow material shall meet or exceed 98 pounds per cubic foot in accordance with ASTM D 698, Standard Specification for Test Methods for Moisture-Density Relations for Soils and Soil-Aggregate Mixtures, Using a 5.5-lb. Rammer and a 12-in. Drop.

3.3.4 Backfill of Trench Excavations

3.3.4.1 General

Backfilling of trenches and tunnel shaft excavations shall be accomplished as soon as possible after the pipe is placed or the tunnel is completed. The Contractor shall have the option of using flushed and jetted or compacted backfill materials. The Contractor shall notify the City of Shepherdsville 48 hours in advance of all flushing and jetting and/or mechanical compaction operations.

3.3.4.1.1 Compaction

Compaction around structures will be performed by mechanical compactor when flushing and jetting of sand and earth material is not possible or practical, or when required by the Plans.

3.3.4.2 Within Limits of Existing or Proposed Paved Surfaces

At the Contractor's option, with prior approval by the City of Shepherdsville (based on the availability of sand which meets the requirements of Section 3.2.2), backfill within the limits of existing or proposed paved surfaces shall consist of: Type I-A Backfill - sand, flushed and jetted, Type I-B Backfill - sand, combination flushed and jetted and mechanically compacted, or Type III Backfill - selected excavated material and/or approved borrow material - mechanically compacted. In special cases and with the approval of the City of Shepherdsville, the Contractor may utilize Type I-A sand backfill - flushed and jetted in the lower portion of the excavation and Type III backfill selected excavated materials - mechanically compacted in the upper portion of the excavation.

- (A) Sand - Flushed and Jetted (Type I-A). After the trench has been completely backfilled with sand, the backfill shall be densified by thoroughly flushing and jetting with water, beginning at the downstream end of the trench and proceeding upstream. Water to be used for flushing and jetting shall be supplied through hoses and pipes having a minimum diameter of 2 inches. The jet pipe shall have a minimum diameter of 1-1/2 inches. Jet pipes used to penetrate the backfill material shall be equipped with a shut-off valve and be of sufficient length to completely penetrate the sand backfill. The jet pipe shall be inserted into the sand backfill at a maximum spacing along the trench of 6 feet and the spacing shall be staggered along the trench area. The jet pipe shall penetrate the sand backfill to within 12 inches of the crushed stone encasement. Care shall be exercised to prevent the jet pipe from penetrating the crushed stone encasement. When the depth of the trench exceeds the length of the jet pipe the flushing and jetting shall be completed in lifts. The pipe shall remain in place until water is observed rising above the backfill throughout the full width of the trench and over a length of the trench equal to one-half the distance between adjacent jet installations. If this condition is not observed within a reasonable period, the Contractor shall increase the water flow or provide additional jet pipes. If the Contractor fails to flush and jet the sand backfill in accordance with the Specifications, the sand backfill shall be excavated and replaced with properly flushed and jetted sand backfill or material compacted in accordance with Section 3.3.4.2.C., at no additional cost to the City of Shepherdsville.

The Contractor shall provide all piping, fittings, etc., necessary to deliver the water along the site of the Work and shall arrange with the Louisville Water Company, if applicable, for making the necessary taps and metering. All expenses incurred for installing the pipe and hose, together with the cost of the water, shall be borne by the

Contractor. Following flushing and jetting and prior to pavement construction, the surface of the sand subgrade shall be thoroughly compacted following the procedures described in Section 3.3.4.2.(B).

- (B) Sand, Combination Flushed and Jetted, and Mechanically Compacted (Type I-B). The trench shall be completely backfilled with sand, and the backfill shall be densified by thoroughly flushing and jetting with water. Flushing and jetting procedures shall be in accordance with Section 3.3.4.2.(A) above. Next, the sand backfill shall be removed to a depth of 3 feet below the pavement surface and stockpiled for later mechanical compaction. The exposed surface shall then be thoroughly compacted. The remainder of the trench shall be backfilled in two lifts of sand (approximately 12-inches thick) up to the pavement subgrade level with each lift being thoroughly compacted. For compaction, the Contractor shall supply a vibratory plate compactor or smooth drum vibratory roller capable of compacting sands to a minimum effective depth of 16-inches. The Contractor shall submit the manufacturer's equipment specifications for proof of this required effective compaction depth. The required number of passes of the roller or plate shall be established at the beginning of compaction operations for the Project by taking nuclear density tests to monitor the density increase with increased passes of the roller or plate. The required number of passes shall be set when no further increase in sand backfill density is measured.
- (C) Earth Materials - Compacted (Type III-A). Selected excavated materials or approved borrow materials containing no rock fragments with a maximum dimension larger than 4 inches shall be carefully deposited in uniform, horizontal layers, not exceeding 6 inches in compacted depth, in a zone located from the top of the cradle or encasement up to a horizontal plane located 2 feet above the exterior top of the pipe. Prior to compaction, each layer shall be level and evenly distributed on both sides of the pipe so as to not disturb, displace or damage the pipe. Each layer shall be thoroughly compacted to a minimum of 95 percent of the standard Proctor density, at moisture content between plus 2 percent and minus 4 percent of the optimum moisture content, as determined by ASTM D 698, utilizing mechanical compaction. Each layer shall be properly compacted before the next succeeding layer is placed. Any lift of fill which pumps under the weight of the compaction equipment shall be rejected, regardless of the field density test results.

The remainder of the trench from the horizontal plane located 2 feet above the pipe up to the ground surface or top of the existing subgrade shall be backfilled with selected excavated materials containing no rock fragments with a maximum dimension larger than

4 inches, or approved borrow materials. The backfill shall be placed in uniform horizontal layers not exceeding 12 inches in compacted depth. Each layer shall be thoroughly compacted to a minimum of 95 percent of the standard Proctor density and moisture content between plus 2 percent and minus 4 percent of the optimum moisture content, as determined by ASTM D 698, utilizing mechanical compaction methods. Each layer shall be properly compacted before the next succeeding layer is placed. Any lift of fill which pumps under the weight of the compaction equipment shall be rejected, regardless of the field density test results. Follow guidelines set forth in the City of Shepherdsville Specifications Section 3.3.9.3. at no additional cost to the City of Shepherdsville.

- (D) Combination Sand (Type I-A) and Earth Backfill (Type III-A). In trench situations where the lower trench dimensions limit the use of mechanical compaction equipment, the existing site conditions limit the effectiveness of the mechanical compaction methods, or where additional backfill material is required to replace unsuitable excavated materials, the Contractor may utilize flushed and jetted sand backfill in the lower portion of the trench and mechanically compacted earth material in the upper portion of the trench with prior approval of the City of Shepherdsville. The sand backfill operations shall extend from the top of the cradle or encasement up to a point where mechanical compaction can be properly accomplished in accordance with Section 3.3.4.2.C. The mechanical compaction operations shall extend from the top of the sand backfill up to the ground surface or top of the existing subgrade. Follow guidelines set forth in the City of Shepherdsville Specifications Section 3.3.9.3.
- (E) No. 57 Crushed Stone - Compacted. With prior approval from the City of Shepherdsville, No. 57 crushed stone may be used as trench backfill within paved areas. The stone shall be carefully deposited in uniform, horizontal layers not exceeding 12 to 24 inches in compacted depth, depending on the type and size of compaction equipment used. The initial lift(s) of stone immediately above the pipe shall be level and evenly distributed on both sides of the pipe. Each layer shall be thoroughly compacted by making a minimum of two passes using a vibratory plate compactor or smooth drum vibratory roller capable of compacting clean stone to a minimum effective depth of the lift thickness selected. The Contractor shall submit the manufacturer's equipment specifications for proof of this required effective compaction depth.

3.3.4.3 Outside Limits of Existing or Proposed Paved Surfaces

At the Contractor's option, except as otherwise specified in Section 3.3.4.4., trench backfill outside the limits of existing or proposed paved surfaces shall consist of earth materials (selected excavated or approved borrow materials) which are flushed and jetted or compacted. The upper one foot of the earth backfill shall be essentially free from rock, gravel or other hard, durable fragments.

- (A) Earth Materials - Flushed and Jetted (Type II Backfill). The lower portion of the trench backfill extending from the top of the cradle or encasement to a horizontal plane located 2 feet above the exterior top of the pipe shall contain no rock or rock fragments with a maximum dimension larger than 1 inch. The remainder of the trench shall be backfilled with selected excavated materials or approved borrow materials containing no rock fragments larger than 1 cubic foot. After the trench has been completely backfilled with selected excavated material or approved borrow material, the backfill shall be densified by thoroughly flushing and jetting with water, beginning at the downstream end of the trench and proceeding upstream. The backfill shall be thoroughly and uniformly sluiced and flooded by introducing water at the top of the trench and by inserting the jet pipe into the backfill at intervals as specified in Section 3.3.3.2. (A) along the trench. This process shall be continued until the backfill is completely saturated and no further settlement is observed. Hoses, jet pipes and the maximum depth of insertion shall be as specified in Section 3.3.4.2.A. After the backfill in the trench has substantially dried and completed any additional settlement, any settlement below the finish grade shall be refilled with additional earth, and compacted in accordance with (B), below.
- (B) Mechanical Compaction of Earth Materials (Type III-B). Selected excavated materials or approved borrow materials, containing no rock or rock fragments with a maximum dimension larger than 3 inches, shall be carefully deposited in uniform, horizontal layers, not exceeding 6 inches in compacted depth, in a zone located from the top of the cradle or encasement up to a horizontal plane located 2 feet above the exterior top of the pipe. Prior to compaction, each layer shall be leveled and evenly distributed on both sides of the pipe so as not to disturb, displace or damage the pipe. Each layer shall be thoroughly compacted to a minimum of 85 percent of the Standard Proctor density before the next succeeding layer is placed. Any lift of fill which pumps under the weight of the compaction equipment shall be rejected, regardless of the field density test results. Follow guidelines set forth in the City of Shepherdsville Specifications Section 3.3.9.3. The remainder of the trench from the horizontal plane located 2 feet above the top of the pipe up to the ground surface shall be backfilled with selected excavated materials or approved

borrow material containing no rock fragments larger than 1 cubic foot. The material shall be placed in uniform horizontal layers not exceeding 12 inches in compacted depth. Each layer shall be compacted with a dozer or other heavy, earth-moving equipment traveling back and forth over the material until no further settlement is observed.

3.3.4.4 Between Pipe and Drainage Swale or Ditch

The Contractor shall use Type III - A backfill in pipe trenches where a surface ditch or swale is to be constructed above the pipe. This includes all ditches and swales - paved, sodded, rip-rapped or seeded.

3.3.5 Depositing Backfill Material

All backfilling shall be done in a manner to avoid displacing or damaging the pipe or structure. Any pipe or structure damaged or displaced shall be excavated and repaired or replaced at the Contractor's expense.

3.3.6 Backfill Against Structures

3.3.6.1 Backfill Against Retaining Walls and Box Culverts

Unless shown otherwise on the Plans, backfill shall be selected excavated materials or approved borrow materials. The placement of any backfill shall be delayed until representative test samples of the concrete have attained a compressive strength of 3,500 pounds per square inch and the concrete has been in place at least seven days.

When the back slopes bounding the excavation lie within the slope limits of 6:1 to 1/4:1, the planes of the slopes shall be destroyed by stepping or serrating to prevent wedging action during compaction.

Backfill material shall be placed and compacted in uniform horizontal layers not exceeding 6 inches in thickness, loose measurement. Each layer shall be compacted by means of approved manually-directed mechanical tampers or rollers. Successive blows of the tamper shall overlap no less than one-fourth of the width of the tamper head. Successive passes of the roller shall overlap no less than one-fourth the width of the roller. Each layer shall be dampened when necessary to ensure the maximum density obtainable, as directed. The Contractor shall not permit heavy rolling compaction equipment to operate closer to the back of the culvert or retaining walls than a distance equal to the unbalanced height of the fill at any time. Backfill that will be beneath or within a proposed embankment or pavement area shall be thoroughly compacted to a minimum of 95 percent of the standard Proctor density, as determined by ASTM D 698. Each layer shall be properly compacted before

the next succeeding layer is placed. Backfill shall be brought up equally on both sides of the walls to the elevation shown on the drawings to prevent unequal loading.

3.3.6.2 Backfill Against Wet Wells and Deep Structures

Unless otherwise shown on the Plans, backfill shall be selected excavated materials, approved borrow materials, sand, or crushed stone. The backfill shall be brought up evenly on all sides to reduce any unbalanced lateral loading that could cause tilting, or opening of joints between riser sections.

For earth materials, backfill shall be flushed and jetted, or mechanically compacted as set forth in the City of Shepherdsville Specifications Section 3.3.4.3. Section (B) and Section 3.3.9.3. when directed by the City of Shepherdsville or as required by the Plans.

3.3.7 Embankments

Embankments placed in areas over which sanitary or storm drainage facilities will be constructed, pavements will be constructed, which will be subjected to erosive action of water flowing through adjacent channels or streams, or for the purpose of storm water detention basins, shall be constructed of selected excavated materials or approved borrow materials. Embankment material shall be placed and compacted in uniform horizontal layers not exceeding 12 inches in thickness, loose measurement. Each layer shall be thoroughly compacted to a minimum of 95 percent of standard Proctor density at moisture content between plus 2 percent and minus 4 percent, as determined by ASTM D 698. Each layer shall be properly compacted before the next succeeding layer is placed. Any lift of fill which deflects under the weight of compaction equipment shall be rejected, regardless of field density test results.

3.3.8 Final Grading

Final grading around and above sanitary sewer or storm drainage improvements shall be shaped to the slope of adjacent undisturbed ground. Sufficient grading operations shall be performed to prevent ponding and to provide natural surface drainage from adjacent areas into storm water inlets, ditches or swales.

3.3.9 Inspection and Testing

3.3.9.1 Inspection Personnel

All flushing and jetting operations shall be performed in the presence of a City of Shepherdsville Inspector. All backfill operations which involve mechanical compaction and which are required to meet a specified degree of compaction shall be performed in the presence of a City of Shepherdsville inspector or an experienced earthwork inspector who represents an Agency

designated or approved by the City of Shepherdsville to provide earthwork inspection and testing on Projects involving City of Shepherdsville facilities.

3.3.9.2 Laboratory Tests

Selected excavated materials or approved borrow materials shall be sampled and tested for standard Proctor density, optimum moisture content and classification by an Agency approved by the City of Shepherdsville. These tests will be required whenever such materials are proposed for use in compacted backfill or embankment and a specified degree of compaction is required. A minimum of one week should be allowed for the Agency to obtain samples and complete the tests.

3.3.9.3 Field Density Tests

Field density tests shall be performed on compacted backfill or embankment materials. The City of Shepherdsville must be notified 24 hours in advance. Scheduling of field density tests with an approved Agency shall be performed 24 hours in advance of the backfill operations. Acceptable methods of performing field density tests include the following:

- (A) Nuclear Density Test - ASTM D 2922, Standard Specification for Test Methods for Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).
- (B) Sand Cone Test - ASTM D 1556, Standard Specification for Test Method for Density of Soil In-Place by the Sand Cone Method.
- (C) Rubber Balloon Test - ASTM D 2167, Standard Specification for Test Method for Density and Unit Weight of Soil In-Place by the Rubber Balloon Method.
- (D) Drive-Cylinder Method - ASTM D 2937, Standard Specification for Test Method for Density of Soil In-Place by the Universal Cylinder Method.

The frequency that field density tests shall be performed will be in accordance to the following minimum schedule. Additional testing shall be performed when directed by the Inspector or by the City of Shepherdsville.

- (A) A minimum of 1 test per 100 cubic yards of material placed and compacted in trenches or 500 cubic yards of material in embankments.
- (B) A minimum of 1 test per lift per 200 feet of material placed and compacted in trenches.

- (C) A minimum of 1 test per lift of material placed and compacted in embankments.
- (D) A minimum of 1 test per shift (day) of compaction operations.
- (E) A minimum of 1 test whenever there is a suspicion of a change in material, moisture content, or degree of compaction control.

When instructed by the City of Shepherdsville, the Contractor shall excavate previously untested backfill or embankment material to a particular grade for testing. Backfilled areas that do not pass this test shall be excavated and recompacted until they meet the compaction specifications. Areas excavated for testing shall be recompacted in accordance with the Project Specifications. The cost of this Work shall be at the Contractor's expense.

3.3.9.4 Payment for Inspection and Testing

When the Contract requires mechanical compaction on the City of Shepherdsville Capital Improvement Projects, earthwork inspection and testing shall be performed as specified at the City of Shepherdsville's expense. When the Contractor has the option of backfilling by flushing and jetting or by mechanical compaction, and he selects to backfill using mechanical compaction, earthwork inspection and testing shall be performed as specified at the Contractor's expense for any Project. The mechanical compaction option shall be approved by the City of Shepherdsville prior to placement of backfill and the Testing Agent must be designated in writing.

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SECTION 4

CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS

PIPEWORK

4.1 DESCRIPTION OF WORK

This Work shall consist of the furnishing, bedding, laying, jointing, and testing of all sanitary sewer, force main or drainage pipe shown on the Plans or otherwise required by the Contract. The Contractor shall limit active pipe installation to assure clean up following such Work, in accordance with Section 4.3.1. of these Specifications.

4.2 MATERIALS

4.2.1 General

Sanitary sewer, force main or drainage pipe may be any of the following types, unless shown otherwise in the Contract. Pipe strength classes listed are the minimum acceptable classes for each type of pipe. Conditions of the construction may warrant a stronger pipe than listed herein, and the pipe supplied shall be as required by the Specifications or shown on the Plans, subject to the approval of the City of Shepherdsville. If the contractor requests a method other than the Plans and Specifications, and the method requires a stronger pipe, the contractor will incur the additional cost of the stronger pipe needed. Any pipe found defective, or otherwise not meeting the Specifications shall be rejected and replaced by pipe meeting these Specifications. The City of Shepherdsville reserves the right to randomly test up to 3 sections of pipe for each size furnished, in accordance with ASTM standards. Upon passing the tests, the City of Shepherdsville shall reimburse the Contractor for the cost of the testing. The Contractor shall pay for any failed tests.

The Contractor shall furnish three copies of the supplier's certification stating that pipe materials were manufactured, sampled, tested and inspected in accordance with the standards listed in this Section and have been found to meet those requirements.

4.2.2 Sanitary Sewers

4.2.2.1 Reinforced Concrete Pipe.

Reinforced concrete pipe is not allowed except as approved by the City of Shepherdsville.

4.2.2.2 Ductile Iron Pipe and Fittings.

Ductile iron pipe shall meet the requirements of ANSI/AWWA C151/A21.51, Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids. Unless shown otherwise on the Plans or in the Contract, the thickness class shall be determined based on a working pressure of 150 psi, in accordance with ANSI/ AWWA C150/A21.50, Thickness Design for Ductile Iron Pipe.

Flanged joint ductile iron fittings shall meet the requirements of ANSI/AWWA C110/A21.10, Ductile Iron and Gray Iron Fittings, 3 inch through 48 inch for Water and Other Liquids. Unless shown otherwise on the Plans or in the Contracts, Class 250 fittings with class 53 wall thickness shall be used.

Mechanical, push on and other such joints shall meet the requirements for ductile iron fittings, 3 in. through 16 in., ANSI/AWWA C153/A21.53. Where these short bodied compact fittings are to be fitted to aged existing cast iron pipe of larger diameter than specified in A21 standards, mechanical joint sleeves or bell-and-spigot sleeves shall provide transition.

All pipe and fittings shall be cement-lined in accordance with ANSI/AWWA C104/A21.4, Cement-Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings, or polyurethane lined over concrete or ductile iron or gray iron pipe and fittings. The polyurethane lining shall be an ASTM Type V, chemical cure, 100% solids, elastomeric and aromatic with no sand fillers or extenders added. It shall be capable of being spray applied to 50 mils nominal thickness in a single application. Minimum lining thickness shall be 40 mils. The polyurethane lining shall be monolithic, flexible membrane that is corrosion, abrasion, and impact resistant; with a Shore "D" hardness of 60 to 65 at 78°F (25.5°C); a tensile strength of 2,878 psi and elongation of 52% per ASTM D-412; shall be resistant to abrasion as measured by a weight loss of no more than 42 mgs. per ASTM D-1044; and shall have a water vapor transmission rate (WVTR) of no more than 0.016 grams per 100 square inches (254 cm²) per 24 hours (75 mils DFT @ 73°F (22.7°C), 100% RH, per ASTM F-1249-90). Unless otherwise noted on the Plans or in the Special Provisions, all pipes shall be cement lined. Lining thickness per ANSI/AWWA C-104/A21.4 shall be 1/16 in. (min.) for 3 through 12 in. pipe, 3/32 in. for 14 in. through 24 in. pipe, and 1/8 in. for 30 through 54 in. pipe.

Joints shall be push-on rubber gasket types which meet the requirements of ANSI/AWWA C111/A21.11, Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings. When flanged joints are required, they shall meet the requirements of ANSI/AWWA C115/A21.15, Flanged Ductile Iron and Gray Iron Pipe with Threaded Flanges. Mechanical flanged restrained joints may be used when approved by the City of Shepherdsville.

All flanged and mechanical joints for ductile iron pipe and fittings shall be made with stainless steel nuts, bolts, etc.

4.2.2.3 Polyvinyl Chloride (PVC) Pipe and Fittings.

Unless shown otherwise on the Plans, in the Contract, or stipulated by the City of Shepherdsville, the Contractor may, at his option, use any of the following types of PVC pipe:

- (A) PVC pipe meeting the requirements of ASTM D 3034, Standard Specification for Type PSM Poly (Vinyl Chloride)(PVC) Sewer Pipe and Fittings. Unless shown otherwise on the Plans or in the Contract, SDR 35 pipe shall be required.
- (B) PVC pipe meeting the requirements of ASTM F 679, Standard Specification for Poly (Vinyl Chloride)(PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings. Unless shown otherwise on the Plans or in the Contract, SDR 35 (approximate) shall be required.
- (C) PVC pipe meeting the requirements of ASTM F 789, Standard Specification for Type PS-46 Poly (Vinyl Chloride)(PVC) Plastic Gravity Flow Sewer Pipe and Fittings.
- (D) PVC pipe meeting the requirements of ASTM D 1785, Standard Specification for Poly (Vinyl Chloride)(PVC) Plastic Pipe, Schedules 40, 80 and 120. Unless shown otherwise on the Plans or in the Contract, Schedule 40 pipe shall be required. Fittings shall meet the requirements of ASTM D 2466, Standard Specification for Poly (Vinyl Chloride)(PVC) Plastic Pipe Fittings.
- (E) PVC open or closed profile pipe meeting the requirements of ASTM F 794, Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.
- (F) Corrugated PVC pipe meeting the requirements of ASTM F 949, Latest Revision, "Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings".

Polyvinyl Chloride Pipe shall be installed in accordance with these Specifications and ASTM Standards for "Underground Installation of Flexible Thermoplastic Sewer Pipe", D2321 requiring a minimum trench width of not less than the greater of either the pipe outside diameter plus 16 inches or the pipe outside diameter times 1.25 plus 12 inches.

Joints for PVC pipe meeting the requirements of ASTM D 3034, ASTM F 679, ASTM F 789, ASTM F949, and ASTM F 794 shall be gasket, bell and spigot, push-on types which meet the requirements of ASTM D 3212, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals. Gaskets shall meet the requirements of ASTM F 477,

Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe. For 4 inch diameter pipe meeting the ASTM F 949 requirements, double gaskets shall be used at the Tee/ Wye.

4.2.2.4 Polyethylene Pipe and Fittings.

Polyethylene pipe shall meet the requirements of ASTM F 894, Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe. The pipe shall be manufactured from material which meets the requirements of ASTM D 1248, Standard Specification for Polyethylene Plastics Molding and Extrusion Materials for Type III, Class C, Category 5, Grade P34 High Density Polyethylene. The pipe class shall be as shown on the Plans or in the Contract. Polyethylene pipe shall not be delivered to the site until the City of Shepherdsville has provided approval for the pipe class to be used.

Polyethylene pipe shall be installed in accordance with these Specifications and ASTM Standards for "Underground Installation of Flexible Thermoplastic Sewer Pipe", D2321.

Joints shall be gasket, bell and spigot, push-on types which meet the requirements of ASTM D 3212, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals. Gaskets shall meet the requirements of ASTM F 477, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

4.2.2.5 Vitrified Clay Pipe and Fittings.

Vitrified clay pipe is not allowed unless approved by the City of Shepherdsville.

4.2.2.6 Adapters and Couplings.

Connections of sanitary sewer pipes of dissimilar materials or different sizes shall be made with connectors or adapters of the compression or mechanical seal types, and which have been approved by the City of Shepherdsville. Bitumastic, butyl resin and mastic types of connections will not be acceptable.

4.2.3 Force Mains

4.2.3.1 Polyvinyl Chloride (PVC) Pipe and Fittings.

Unless shown otherwise on the Plans or in the Contract, the Contractor may use any of the following types of PVC pipe.

- (A) PVC pipe meeting the requirements of AWWA C 900, Standard Specification for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch. The minimum pressure class allowance should be class 150 (DR18). PVC pipe meeting the requirements of AWWA C 905, Standard Specification for Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 inch through 36 inch, pressure rated 165 psi (DR25). The minimum pressure class allowed shall be Class 150 (DR18).

Joints shall be gasket, bell and spigot, push-on types which meet the requirements of AWWA C 900. Gaskets shall meet the requirements of ASTM F 477, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe. All pipe should be cast iron outside diameter.

- (B) PVC pipe meeting the requirements of ASTM D 1785, Standard Specification for Poly (Vinyl Chloride)(PVC) Plastic Pipe, Schedules 40, 80, 120. The minimum pressure rating allowed shall be 150 psi.

Joints can be solvent-cement joints on pipes less than 4 inch and shall meet the requirements of ASTM D 2855, Standard Specification for Making Solvent-Cement Joints with Poly (Vinyl Chloride)(PVC) Pipe Fittings. The solvent-cement shall meet the requirements of ASTM D 2564, Standard Specification for Solvent-Cement for Poly (Vinyl Chloride)(PVC) Plastic Pipe and Fittings.

- (C) PVC pipe meeting the requirements of ASTM D 2241, Standard Specification for Poly (Vinyl Chloride)(PVC) Pressure-Rated Pipe (SDR Series). The minimum pressure rating shall be 150 psi.

Joints shall be gasket, bell and spigot, push-on types which meet the requirements of ASTM D 3139, Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals. Gaskets shall meet the requirements of ASTM F 477, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

4.2.3.2 Polyethylene Pipe and Fittings.

Polyethylene pipe shall meet the requirements of ASTM F 714, Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter. Materials shall meet the requirements of ASTM D 3350, Standard Specification for Polyethylene Plastic Pipe and Fittings Materials, for Polyethylene Cell Classification PE 345434C. Unless shown otherwise on the Plans or in the Contract, the pressure rating to be used shall be 160 psi (SDR 11).

Joints shall be butt fused joints which meet the requirements of ASTM D 3261, Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

4.2.4 Drainage Pipe

4.2.4.1 General.

On a case-by-case basis, thermoplastic or corrugated metal pipe products may be used for storm drainage facilities when shown on the Plans and approved by the City of Shepherdsville. Only the following types of thermoplastic pipe, which are the City of Shepherdsville approved products, will be considered:

- A. High Density Polyethylene Corrugated Pipe
- B. Polyvinyl Chloride Pipe (PVC)

4.2.4.2 Reinforced Concrete Pipe.

Circular reinforced concrete pipe shall meet the requirements of ASTM C 76, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Storm Pipe. Elliptical reinforced concrete pipe shall meet the requirements of ASTM C 507, Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe. Unless shown otherwise on the Plans or in the Contract, Class III pipe shall be used.

Rubber and plastic joints shall meet the requirements of AASHTO M 198, Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets, for Type A (Rubber Gaskets), Type B (Flexible Plastic Gaskets) gaskets, or other City of Shepherdsville approved gaskets. Bituminous mastic joint sealing material shall not be allowed in the construction of reinforced concrete pipe systems.

4.2.4.3 High Density Polyethylene Corrugated Pipe.

Corrugated polyethylene pipe with an integrally formed smooth interior shall meet the requirements of AASHTO M 294, Standard Specification for

Corrugated Polyethylene Pipe, 12 to 36 inch diameter, for Type S pipe. Polyethylene pipe shall not be delivered to the site until the City of Shepherdsville has provided written approval for the pipe to be used.

The pipe shall have a minimum pipe stiffness at 5% deflection as follows when tested in accordance with ASTM D-2412.

<u>Diameter</u>	<u>Pipe Stiffness</u>
12"	45 psi
15"	42 psi
18"	40 psi
24"	34 psi
30"	28 psi
36"	22 psi

Joints shall be made using split-corrugated couplings manufactured by the pipe manufacturer and exceeding the soil tightness requirements of the AASHTO Standard Specifications for Highway Bridges, Section 23 (2.23.3.).

4.2.4.4 Corrugated Steel Pipe.

Corrugated steel pipe and coupling bands shall meet the requirements of AASHTO M 36, Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains. Pipes shall be fabricated from aluminum-coated steel sheet which meets the requirements of AASHTO M 274, Standard Specification for Steel Sheet, Aluminum-Coated (Type 2) for Corrugated Steel Pipe. The gage of the steel sheet used to fabricate the pipe shall be as shown on the Plans.

Joints shall be made using coupling bands and gaskets meeting the requirements of AASHTO M 36 and AASHTO M 274.

4.2.4.5 Polyvinyl Chloride (PVC) Pipe and Fittings.

Polyvinyl chloride pipe shall meet the requirements of Subsection 4.2.2.3. of these Specifications.

4.2.4.6 Vitrified Clay Pipe and Fittings.

Vitrified clay pipe shall meet the requirements of subsection 4.2.2.5. of these Specifications.

4.2.5 Cast-In-Place Pipe.

4.2.5.1 Concrete.

Concrete for all cast-in-place storm sewer pipes and collars shall be Class A concrete as specified in Section 6 of these Specifications.

4.2.5.2 Steel Reinforcement.

Deformed steel reinforcing bars shall be Grade 60 bars of the sizes, dimensions, spacings and locations shown on the Plans. Steel reinforcement and its storage shall be as specified in Section 6 of these Specifications.

4.2.5.3 Waterstops.

Waterstops shall be PVC waterstops of the shape and dimensions as shown on the Plans and meeting the material requirements as specified for waterstops in Section 5 of these Specifications.

4.2.6 Cradles and Encasements

4.2.6.1 Crushed Stone

Crushed stone for cradles and encasements shall be as set forth in Subsection 3.2.1. of these Specifications.

4.2.6.2 Concrete

Concrete for cradles, encasements or caps shall be Class B concrete as set forth in Section 6 of these Specifications.

4.2.7 Marking Tape

Marking tape shall be a composite plastic metallic tape, at least 5 mils in thickness with impervious plastic film on both sides and aluminum foil in center. The minimum tensile strength shall be 185 lbs. The tape shall be at least 3 inches in width, colored green, and shall be permanently printed on both sides "Caution Buried Sewer Below".

4.3. EXECUTION OF WORK

4.3.1 General

Prior to beginning pipe laying operations, the trench shall have been excavated to the subgrade level and unsuitable foundation conditions, when encountered, shall be corrected in accordance with Section 3 of these Specifications. The pipe shall be supported on a crushed stone cradle or a concrete cradle as shown on the Plans, specified herein, or directed by the City of Shepherdsville.

Crushed stone or concrete shall be used to encase the pipe as specified herein or directed by the City of Shepherdsville.

4.3.2 Cradle and Encasement.

Cradle and encasement shall be of crushed stone or concrete and shall be installed as specified and within the limits shown on the Plans or directed by the City of Shepherdsville.

4.3.2.1 Crushed Stone Cradle.

Crushed stone cradle shall mean the placement of crushed stone from the subgrade level (6 inches below the outside of the pipe) up to the springline of the pipe. The crushed stone shall be deposited in the trench to grade, allowing for the thickness of the pipe wall. Bell holes shall be dug to relieve the bells of all concentrated loads and to provide uniform support throughout the pipe section. For larger pipes, the crushed stone shall be shoveled and shovel-sliced beneath the haunches of the pipe to assure uniform support. Unless shown otherwise on the Plans or directed by the City of Shepherdsville, the following types of pipes shall be supported on a crushed stone cradle.

A. Ductile Iron Pipe

4.3.2.2 Crushed Stone Encasement.

Crushed stone encasement shall mean the placement of additional crushed stone above the crushed stone cradle to a level at least 6 inches above the outside top of the pipe. The additional stone shall be placed in such manner to prevent damage to the pipe. Unless shown otherwise on the Plans or directed by the City of Shepherdsville, the following types of pipe shall be encased in crushed stone.

- A. Polyvinyl Chloride Pipe
- B. Polyethylene Pipe
- C. Corrugated Polyethylene Pipe
- D. Corrugated Steel Pipe
- E. Corrugated Polyvinyl Chloride Pipe

4.3.2.3 Concrete Cradle.

Where a concrete cradle is required as additional support for a sanitary sewer or storm drainage pipe, or if a sanitary sewer pipe will have less than 2 feet of vertical clearance above an existing or proposed storm drain or utility conduit, a concrete cradle shall be installed. The length of the concrete cradle shall be as shown on the Plans or 2 feet beyond the outside edge of the

underlying storm drain or utility conduit. The pipe shall be laid to line and grade, and shall be supported on concrete blocks, bricks or saddles set to prevent both vertical and lateral movement of the pipe. The use of wooden blocks will not be permitted. Concrete shall be placed around the pipe up to the springline of the pipe. Proper bracing shall be provided to prevent displacement or flotation of the sewer pipe during placing of concrete.

4.3.2.4 Concrete Cap.

Where shown on the Plans or where a sanitary sewer pipe will have less than 2 feet of vertical clearance below an existing or proposed storm drain or utility conduit, a concrete cap shall be installed unless the pipe itself is proven to the City of Shepherdsville to have adequate strength. The length of the concrete cap shall be as shown on the Plans or 2 feet beyond the outside edge of the storm drain or utility conduit, or 2 feet beyond the point where the sewer pipe attains 30 inches of cover in an easement or 4 feet of cover in a right-of-way, or surfaces subject to vehicular traffic, or as directed by the City of Shepherdsville. The sewer pipe shall be laid and supported on a crushed stone cradle, and concrete shall be placed around the pipe and at least 6 inches above the top of the pipe for the full trench width, as shown on the City of Shepherdsville's Standard Drawings. Proper bracing shall be provided to prevent displacement or flotation of the sewer pipe during placing of the concrete.

4.3.2.5 Concrete Encasement.

Where shown on the Plans or where conditions exist requiring additional pipe protection (stream crossings, ditch crossings, shallow trench or poor soil conditions), pipes shall be encased in concrete, as determined by the City of Shepherdsville. The length of the concrete encasement shall be at least 2 feet beyond the point where additional pipe protection is required, as shown on the Plans, or as directed by the City of Shepherdsville. The sanitary sewer or storm drainage pipe shall be laid and supported as required for a concrete cradle, and concrete shall be placed around the pipe 6 inches either side of it and up to at least 6 inches over the top of the pipe. Proper bracing of the pipe shall be provided to prevent movement or flotation of the sewer pipe during placing of concrete. In rock-bottom streams, the encasement shall extend from 6 inches below the pipe up to the original rock level. Encasement shall be required when crossing a blue line stream and shall extend to 5 feet beyond the top of bank on each side of said stream. Concrete encasement is required for plastic pipe with less than 30 inches of cover in easements and less than 4 feet of cover in street rights-of-way. When a concrete encasement is required for property service connections, payment shall be incidental to the installation of the service connections. Unless otherwise directed by the City of Shepherdsville, a 4-inch PVC drain pipe shall be placed in the trench next to the carrier pipe and shall extend through the concrete encasement and

5 feet into the crushed stone encasement on both sides. The drain pipe shall be open on both ends. This will allow unimpeded flow of any groundwater in the sewer trench.

4.3.2.6 Safeloading.

Safeloading shall consist of completely filling the designated areas with grout in such a manner to make them safe from collapse or at the Contractor's option, safeloading may be done by filling the designated area with free-flowing low strength mortar. Septic tanks shall be cleaned prior to safeloading. Appreciable deposits of debris shall be removed from other structures prior to safeloading. The ends of existing culverts shall be plugged by use of bulkheads containing small openings at the tops through which the grout may be pumped at a minimum pressure of 15 pounds per square inch. All structures to be safeloaded shall be completely filled with grout or low strength mortar.

4.3.3 Pipe Installation

4.3.3.1 Inspection and Handling.

All pipe shall be inspected on delivery and such pipe sections that do not conform to these Specifications and which are not suitable for use shall be rejected and immediately removed from the Work site. Equipment used to handle, lay, and joint pipe shall be so used to prevent damage to the pipe and its jointing materials. All pipe and fittings shall be carefully handled and lowered into the trench. Damaged pipe or jointing material shall not be installed.

4.3.3.2 Pipe Laying and Jointing.

The laying of pipe shall begin at the lowest point and proceed upstream with the bell or groove ends pointing upstream. Prior to making pipe joints, all joint surfaces shall be clean and dry and free from gravel or other extraneous materials. All necessary lubricants or adhesives shall be used as recommended by the pipe manufacturer. Suitable means shall be used to force the spigot or tongue end of the pipe the proper distance into the bell or groove end without damage to the pipe and its jointing materials and without disturbing previously laid pipe sections. Special care shall be taken to ensure that the pipe is solidly and uniformly cradled or encased in accordance with these Specifications. No section of pipe shall be brought into position for jointing until the preceding section has been bedded and secured in place. Joint sealant materials used on storm drain pipe shall be properly sized to fill the pipe gap to prevent any visible infiltration.

4.3.3.3 Line and Grade.

Each section of pipe shall be checked for vertical and horizontal alignment immediately after being laid. A calibrated survey transit shall be on site and in use at all times during pipe laying operations. All adjustments to line and grade must be made by scraping away or filling in under the barrel of the pipe and not by wedging or blocking up any portion of the pipe or striking the pipe in an effort to drive it down. Curved alignments may be allowed on a case-by-case basis, as approved by the City of Shepherdsville, except on gravity sanitary sewers smaller than 48 inches in diameter.

4.3.3.4 Protection of Installed Pipe.

As the Work progresses, the interior of the pipe shall be protected from and cleaned of all dirt, cement, extruded joint materials, debris, and other extraneous materials. Whenever pipe laying is stopped for any significant length of time, such as at the end of a Workday, the unfinished end shall be protected from displacement, floatation, cave-in, and in-wash of soil or debris. A suitable temporary tight-fitting plug, stopper or bulkhead shall be placed in the exposed bell or groove end of the pipe.

Water shall not be allowed to rise in the excavation until the joint materials and/or concrete cradle or encasement has hardened and cannot be damaged by the water. Particular care shall be used to prevent disturbance or damage to the pipe and the joints during backfilling or at any other time. No walking or Working over the pipe, except as necessary for placing and compacting backfill, or operating compaction equipment directly over the pipe shall be allowed until a minimum of 24 inches of cover over the outside top of the pipe has been placed. Mechanical compaction in this zone shall be with manual pneumatic tampers or other hand-operated methods which will not damage the pipe.

4.3.3.5 Property Service Connections.

Property service connections shall be installed at the locations and with the pipe sizes shown on the Plans. Manufactured wye and tee fittings and reducers shall be used for new sewer line installations, unless noted otherwise in the Contract. The property service connection pipe shall be laid on a uniform grade from the sanitary sewer to the property line. Where a stack is required, the pipe shall be laid on a uniform grade from the top of the stack to the property line. The pipe depth at the property line shall be at least 30 inches in easements, and shall be 4 feet below the final street grade, unless shown otherwise on the Plans or directed by the City of Shepherdsville. Where no final street grade has been established, the depth of the connection shall be as directed by the City of Shepherdsville. For existing sewer lines, property service connections shall be made with the City of Shepherdsville approved wye, tee saddles or insert-a-tees only.

Four or six-inch corrugated PVC property service connections will not be allowed.

When necessary, the Contractor shall furnish and install a short length of sewer pipe to allow the T-branch to be positioned at a right angle to the required location of the property service connection pipe.

When required, in accordance with Section 4.3.2.5. of these Specifications, concrete encasement shall be installed on the property service connection. This Work shall be incidental to the installation of the service connection.

At the upstream end of each property service connection, the Contractor shall install a watertight stopper or cap. For any thermoplastic pipe other than SDR-35, an SDR-35 adapter shall be installed at the end of each property service connection. The Contractor shall mark the end of each property service connection with a 2x4 board which extends from the pipe to approximately 3 feet above the ground surface and marked with green paint (Catalog No. 4634 Sewer Green Fluorescent by Rainbow Manufacturing, or approved equal).

4.3.3.6 Stacks.

Stacks shall be constructed at the locations and to the height shown on the Plans or directed by the City of Shepherdsville. Stacks shall be constructed in accordance with the City of Shepherdsville's Standard Drawings.

4.3.3.7 Stoppers and Bulkheads.

When the open ends of pipes or fittings smaller than 18 inches in diameter are to be sealed, the openings shall be sealed with stoppers, cemented into place using a rubber gasket between the stopper and bell or socket. Openings 18 inches in diameter or larger shall be sealed with brick masonry or concrete bulkheads at least 4 inches thick.

All openings into pipes shall be protected from the entrance of earth, water or other extraneous materials. If a temporary bulkhead is constructed to prevent sewage from backing into the excavation or to prevent extraneous material from entering the sewer, the Contractor shall be responsible for reconstructing, repairing or replacing those portions of the existing sewer removed or damaged by this operation.

When an existing bulkhead is to be removed, its removal shall be coordinated with the City of Shepherdsville.

During construction, use a mechanical plug, properly braced and tied off, when tying into an existing sewer. The plug shall remain until the sewer lines are accepted by the City of Shepherdsville. It is the Contractor's responsibility to remove the plug prior to approval of flow being allowed into the system. The Contractor shall assume full responsibility for any damage or claims due to the installation and removal of the plug.

4.3.3.8 Marking Tape for Force Mains and Property Service Connections.

Detectable marking tape shall be as specified in Section 4.2.7 of these specifications, buried approximately 12 inches below the finished grade except under pavement, when it shall be 24 inches into the subgrade over all force mains and property service connections.

4.3.4 Cast-In-Place Pipe

4.3.4.1 General.

Cast-in-place pipe construction shall be performed in accordance with the applicable provisions of Section 6 of these Specifications.

4.3.4.2 Construction Joints.

When shown on the Plans, concrete shall be placed in the invert and the arch sections of the barrel in two separate operations. A keyed construction joint shall be formed between the invert and arch sections. Transverse construction joints shall be constructed with keys and at locations shown on the Plans. PVC waterstops shall be placed at all longitudinal and transverse construction joints in cast-in-place sanitary sewer barrels.

4.3.4.3 Concrete Collar.

Where cast-in-place pipes join precast pipe, a concrete collar shall be constructed around the joint, as shown on the Plans.

4.3.5 Leakage Testing for Sanitary Sewers

4.3.5.1 General.

Testing shall be scheduled 48 hours in advance in order for the City of Shepherdsville to provide an inspector on site. The Contractor shall perform leakage tests on sanitary sewer pipes and force mains to ensure that installed pipes are not subject to excessive infiltration or exfiltration. Sanitary sewer pipes installed in areas where other underground facilities will be constructed subsequent to the sanitary sewer shall be tested twice; at the completion of the sanitary sewer installation, and following the installation of

the other underground facilities. All leakage testing must be performed in the presence of a representative of the City of Shepherdsville. No leakage testing shall be performed prior to jetting.

When conducting any leakage test, the Contractor shall provide all meters, weirs, gages, water, equipment and personnel necessary to perform the test as specified. The City of Shepherdsville shall provide the inspection personnel, stopwatch, recording forms and calculations to demonstrate if the test passed or failed.

If a pipe installation fails to pass the requirements as specified herein, the Contractor shall repair or replace all defective materials or Workmanship, and conduct additional leakage tests necessary to demonstrate that the repaired section meets the leakage requirements. If requested by the City of Shepherdsville the Contractor shall submit in writing a method of repair, and must be approved by the City of Shepherdsville before repair can begin.

4.3.5.2 Low-Pressure Air Tests.

When conducting a low-pressure air test, the Contractor shall securely install and brace all plugs prior to pressurizing the pipe. Personnel shall not be allowed to enter manholes when the sewer pipe is pressurized. Low-pressure air tests shall be conducted in accordance with the following:

- (A) Reinforced Concrete Pipe - ASTM C 924, Recommended Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Test Method.
- (B) Polyvinyl Chloride Pipe (PVC), Corrugated PVC Pipe, Polyethylene Pipe, Corrugated Polyethylene Pipe - UNI-B-6 Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe. The "half-time" testing method will be accepted for these pipes only if the section of pipe being tested has a zero drop in pressure for half the test time specified for the pipe's length to diameter ratio.
- (C) Vitrified Clay Pipe - ASTM C 828, Recommended Practice for Low-Pressure Air Test of Vitrified Clay Pipe Lines.

4.3.5.3 Infiltration/Exfiltration Tests for Concrete Pipe.

Reinforced concrete pipe may be tested for direct infiltration or exfiltration in lieu of performing low-pressure air tests. Tests shall be performed in accordance with ASTM C 969, Standard Practice for Infiltration and Exfiltration

Acceptance Testing of Installed Precast Concrete Pipe Lines, except that the allowable rate of infiltration or exfiltration shall be 150 gallons per 24 hours

per inch diameter per mile of pipe. Regardless of the leakage test results, any spurting or gushing streams of water entering the sewer or manhole shall be sealed.

4.3.5.4 Hydrostatic Tests for Force Mains.

Force mains shall be tested by performing a hydrostatic test. The force main shall be completely filled with water and subjected to an internal pressure of 100 psi or twice the surge plus operating pressure, whichever is greater, not to exceed 125 percent of the maximum pressure rating for the pipe, measured at the downstream end. The pressure shall be held for a period of 2 hours. During the test, leakage from the force main shall be measured. The maximum allowable leakage shall be 1/2 gallon per inch diameter per 1,000 feet of pipe per hour.

4.3.6 Deflection Tests for Storm Sewers and Sanitary Sewers.

The Contractor shall test all thermoplastic main line pipe by use of a calibrated mandrel, or other device approved by the City of Shepherdsville, to ensure that no pipe deflection has occurred greater than 5 percent of the inside diameter of the pipe. Pipe shall be fully backfilled at least 15 days prior to testing. The Contractor shall test the entire length of the sewer installed. Any pipe section exhibiting greater than 5 percent deflection shall be replaced and retested. Should this time frame for testing be waived, and the City of Shepherdsville requires a second deflection test after 30 days, it will be at the Contractor's expense.

Deflection testing shall be performed at the time of the first or final air test. If conditions warrant, the City of Shepherdsville inspector may request additional tests to be performed after final restoration.

NOTE: When failure of the second Air Test requires repair of the main line sewer, an additional deflection test shall be required.

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SECTION 5
CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS
STRUCTURES

5.1 DESCRIPTION OF WORK

This Work shall consist of the construction of manholes, inlets, catch basins, junction boxes, headwalls, box culverts and other sanitary sewer or storm drainage structures of the kind and dimensions shown on the Plans. The construction shall be accomplished in accordance with these Specifications and in conformity with the lines, grades, cross-sections, and details shown on the Plans or established by the City of Shepherdsville. The Work shall include such labor, material, equipment, removal and abandonment of structures, brick masonry, cast-in-place concrete construction, precast concrete construction, rims and covers, frames and grates, miscellaneous iron castings, and all other items as may be necessary to complete the structures as shown on the Plans.

5.2 MATERIALS

5.2.1 Concrete

Concrete for all cast-in-place sanitary sewer and storm drainage structures shall be Class A concrete as specified in Section 6 of these Specifications.

5.2.2 Steel Reinforcement

Deformed steel reinforcing bars shall be Grade 60 bars of the sizes, dimensions, spacings and locations shown on the Plans. Steel reinforcement and its storage shall be as specified in Section 6 of these Specifications.

5.2.3 Grout

Grout shall consist of a mixture of water and cement or cement with fly ash, or water and one part cement or cement with fly ash to two parts mortar sand as defined in Section 804.05 of the KTC Specifications, by volume. The water may be adjusted to produce a mixture of a consistency suitable for job conditions; however, not over 5 1/2 gallons of water shall be used per sack of cement.

5.2.4 Non-Shrink Grout

Non-shrink grout shall be an approved non-shrink, non-staining grout consisting of either a mixture of hydraulic cement, water, fine aggregate, and an approved non-ferrous expansive admixture, or a packaged commercial product and shall meet the requirements of Section 601.06 of the KTC Standard Specifications.

5.2.5 Precast Structures

Any use of precast structures must be so noted on the Plans, including a typical detail for each type of structure for the Project.

Structures which require specially designed footings, cut-off walls, etc. will not be allowed as precast.

Openings in precast structures for pipes shall be the outside diameter of the pipe plus a maximum of 6 inches. In order to use non-shrink grout, the opening shall be the outside diameter of pipe plus 3 inches. (Outside diameter of pipe plus 4 1/2 inches is permissible when tapered hole forms are utilized).

For precast structures (other than those with knockout panels) the opening around the pipe shall either be filled with non-shrink grout for the wall thickness of the structure or the pipe shall be encased with minimum 6 inch collar of concrete from the inside face of the wall to 1'-0" outside the outer face of the wall. The pipe shall be adequately supported to prevent settling while the grout or the concrete encasement is setting up. The inside faces of the structure walls shall be finished with a trowel and wet brush finish.

For circular structures and rectangular structures (other than those with knockout panels) the minimum vertical distance from the holes for the pipes to the top of the structure wall shall be 4 inches. If this vertical distance is less than 12 inches, then additional reinforcing steel shall be furnished for this section. The top slab must be designed for HS-20 loading.

For precast structures with knockout panels, holes for the pipes shall not be cut into the structural members (i.e., top beams and corner columns) and non-shrink grout shall not be allowed to be placed around the pipes. The pipes shall be encased with concrete a minimum 6 inch collar around the outside of pipe or a minimum of 3 inches beyond the hole knocked in the wall, whichever is greater. Also, the concrete encasement shall extend from the inside face of the wall to 1'- 0" outside the outer face of the wall.

Precast structures with knockout panels shall not be used with more than 2 feet of earth cover unless load calculations are supplied.

For rectangular structures where pipe will be installed in adjacent walls (other than those with knockout panels), at least 6 inches of wall (measured from the interior corner) is required on each side of the pipe beyond the precast opening for the pipe. This rule is not applicable for structures which have pipe installed in opposite walls or where one outlet reinforced concrete pipe is utilized.

A wash is required in the bottom of catch basins to provide positive drainage (sloped toward outlet).

Precast structure in roadways other than installed sanitary manholes and wetwells shall have a minimum of two 4” weepholes. There will be a 2 cubic foot burlap or plastic sack filled with No. 57 stone over the weepholes.

5.2.5.1 Precast Manhole Sections

All precast concrete manhole risers, cones, grade rings, flat slabtops, and bases shall conform to the requirements of ASTM C 478, Standard Specification for Precast Reinforced Concrete Manhole Sections, and the City of Shepherdsville's Standard Drawings. All cone and transition sections shall be eccentric in shape. Base and riser sections shall be custom-made with openings to meet indicated pipe alignment conditions. The following applies as to the maximum inside diameter (or horizontal dimension) of pipe to be used with a given size of manhole.

<u>Diameter of Structure</u>	<u>Maximum Size Pipe*</u>
4'- 0"	24 inches
5'- 0"	36 inches
6'- 0"	48 inches

*Outside diameter may be considered on a case-by-case basis for other pipe materials. The minimum distance allowed between precast holes for the pipes shall be 12 inches, or one-half the outside diameter, whichever is larger.

5.2.5.2 Precast Structures (Except Manholes)

If precast structures are furnished, the following requirements shall apply. The structures furnished shall be products on the list of approved precast structures on file with the City of Shepherdsville. To be considered for addition to the list, five copies of shop drawings shall be submitted for review. The shop drawings shall show details of any variation from the City of Shepherdsville's Standard Drawings and shall include any special installation instructions necessary. Specifications for any special materials for joint construction shall be submitted with the shop drawings, and samples of joint materials shall be submitted when requested.

5.2.6 Watertight Sewer Pipe Connections

Watertight sewer pipe connections shall be elastomeric gaskets or couplings manufactured in accordance with ASTM C 923, Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures and Pipes.

5.2.7 Joint Sealants

Rubber and plastic joints shall meet the requirements of AASHTO M 198, Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets, for Type A (Rubber Gaskets), Type B (Flexible Plastic Gaskets) Gaskets, or Forsheda Rubber Gaskets. Bituminous mastic joint sealing material shall

not be allowed in the construction of manhole joints. Type B (flexible plastic) gaskets may not be used in sanitary sewer installations.

5.2.8 Waterstops

Waterstops shall be extruded from an elastomeric plastic compound, the basic resin of which shall be polyvinylchloride. The compound shall contain any additional resins, plasticizers, stabilizers, or other materials needed to ensure that when the material is compounded it will meet the physical property requirements shown below:

<u>Physical Property</u>	<u>Required Value</u>	<u>Test Method</u>
Tensile Strength (Die "C")		
Sheet Material	2,000 psi	ASTM D 412
Finished Waterstop	1,700 psi	ASTM D 412
Ultimate Elongation (Die "C")		
Sheet Material	350% Min.	ASTM D 412
Finished Waterstop	300% Min.	ASTM D 412
Stiffness in Flexure	750 psi Min.	ASTM D 747
Accelerated Extraction		CRD C 572
Tensile Strength (Die "C")	1,750 psi	ASTM D 412
Elongation (Die "C")	300%	ASTM D 412
Effect of Alkali (After 7 Days)		
Change in Weight	-0.1 to 0.25%	
Change in Hardness, shore Durometer	+ or - 5%	
Low Temperature Brittleness	-35°	ASTM D 746
Specific Gravity	1.3	ASTM D 792

When required, the Contractor shall submit a manufacturer's certificate stating that all of the physical property requirements specified above for the sheet material have been satisfied. Field splices for waterstops shall be performed by heat-sealing the adjacent surfaces in accordance with the manufacturer's recommendations. Waterstops shall be manufactured with an integral cross-section which shall be uniform within plus or minus 1/8 inch in width, and the web thickness or bulb diameter within plus 1/16 inch and minus 1/32 inch.

5.2.9 Manhole Steps

Manhole steps shall be polypropylene plastic-coated steel bar with threads having anti-skid properties for hand and foot grips. Manhole steps shall be cast, epoxy grouted, or attached by mechanical means into the walls of the manholes in such manner as to conform with ASTM C 478. Steps shall be spaced not more than 12 inches vertically on centers and shall be so arranged that the lowest rung is no more than 12 inches above the bench, and the top rung is 18 inches below the structure rim

or frame. The steps shall be arranged out of alignment of the flow channel, and shall be centered on the grate or lid opening.

5.2.10 Castings

Castings shall be of the standard City of Shepherdsville type as detailed on the City of Shepherdsville's Castings Standards. Castings shall be of uniform good quality, free from scale, lumps, blowholes, shrinkage, distortions or other defects. They shall be smooth and thoroughly cleaned by shot-blasting. Castings shall meet the requirements of ASTM A 48, Standard Specification for Gray Iron Castings, for Class No. 35-B, Gray Iron. Manhole rims and covers and inlet frames and grates shall be machined or ground at touching surfaces so as to seat firmly and prevent rocking. Any set not matching perfectly shall be removed and replaced.

5.2.11 Manhole Inverts

Manhole Inverts on 8" size lines may have a constant grade of .4% through the structure unless one of the lines exceeds a 10% grade. All grades exceeding 10% on 8" lines and all other pipe sizes shall continue to have their grade ending at the manhole P.I.

5.3 EXECUTION OF WORK

5.3.1 Modification to Existing and Proposed Structures

5.3.1.1 Removal

Existing structures to be removed shall be indicated on the Plans or as directed by the City of Shepherdsville. The City of Shepherdsville reserves the right to retain or reject salvage of any materials encountered. Unless otherwise directed by the City of Shepherdsville, all castings shall be retained by the City of Shepherdsville. All salvage materials retained by the City of Shepherdsville shall be delivered to the appropriate storage yard as directed by the City of Shepherdsville. All remaining materials shall become the property of the Contractor who will be responsible for disposing of same. The excavation shall be backfilled in accordance with Section 3 of these Specifications.

5.3.1.2 Abandonment

Existing structures to be abandoned in place shall be as shown on the Plans or as identified by the City of Shepherdsville. After removing structure frames, covers, grates, and similar items, all pipes shall be bulkheaded as specified in Section 4 of these Specifications. The walls shall be lowered to 2 feet below final grade if in earth or to 12 inches below subgrade if in pavement. The remaining structures shall be filled with crushed stone or sand. In paved areas or where directed by City of Shepherdsville, a 12 inch thick plain concrete slab shall be installed over the manhole or structure top such that it

extends 12 inches beyond the outside face of the manhole or structure. City of Shepherdsville reserves the right to retain or reject salvage of any materials encountered. All remaining materials shall become the property of the Contractor who will be responsible for disposing of same.

5.3.2 Wastewater Treatment Plant Decommissioning

5.3.2.1 General

The Contractor shall furnish all labor, materials, equipment and incidentals required to eliminate the wastewater facilities, including all demolition and removal Work, for the wastewater treatment plant(s) (WWTP) as specified herein.

The Contractor shall submit to the City of Shepherdsville for review and acceptance a written plan and schedule for the elimination of the WWTP(s) including the demolition, removal and disposal Work. This plan and schedule shall include certain elements and milestones specified for the subject WWTP(s). After the Contract is awarded and prior to commencement of the Work, the Contractor shall meet with the City of Shepherdsville to discuss the transfer of flow to the new sanitary sewer system and demolition, removal, and disposal plan. The plan shall include a schedule for disconnection of existing utility services and procedures for the careful removal and disposal of building materials and existing sewage, bio-solids, grit and mixed liquor which may be in tanks, lagoons, etc. Included in the plan must be a detailed description of the methods and equipment to be used for each operation and the sequence of operations.

Do not proceed with elimination of the facilities until the City of Shepherdsville has given written acceptance of the elimination plan.

Specific guidelines for the removal and disposal of material contained in the various individual treatment units are provided below. These guidelines are intended to provide the Contractor with a method of elimination that will meet the approval of the City of Shepherdsville, the Bullitt County Board of Health and the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Waste Management (DWM) and Division of Water. The Contractor is responsible for obtaining all demolition permits, including any transportation permits required to transport the material to their appropriate disposal site(s), prior to commencement of Work. Two (2) copies of these permits shall be submitted to the City of Shepherdsville prior to commencement of Work.

Modifications to the landfill disposal site's existing permit(s) are required by the Division of Waste Management regarding the disposal of wastewater by-product materials at the landfill. The City of Shepherdsville is responsible for preparing the "Application To Accept An Additional Waste Stream" to be submitted to the Kentucky Division of Waste Management (DWM),

including obtaining the required laboratory test results required by both DWM and the landfill. A copy of the permit modification letter from DWM to the landfill allowing them to accept the additional waste stream will be provided to the Contractor prior to commencement of Work.

5.3.2.2 Existing Facility Elimination

Unless otherwise directed by the City of Shepherdsville, the Contractor shall provide the City of Shepherdsville with written notification as stated in the special provisions prior to removing a facility from service.

The Contractor shall utilize the following steps during the process of removing a facility from service. These steps will generally include, but are not limited to:

- (A) Influent Diversion: Discontinue wastewater flow to the existing facility by permanent influent diversion to the newly constructed and approved City of Shepherdsville sanitary sewer system, in accordance with the Contract.
- (B) Supernatant and Mixed Liquor: Carefully remove and transfer the liquor supernatant and mixed liquor to the newly constructed and approved City of Shepherdsville sanitary sewer system in accordance with the City of Shepherdsville's directions.
- (C) Equipment: Remove grit and bio-solids from the previously submerged equipment to render the equipment salvageable.
- (D) Three to Five Percent Bio-solids: Bio-solids which remain in liquid holding tanks or lagoons after removal of supernatant and mixed liquor that have no greater than 3% - 5% solids concentration with no additional water added, may be removed and hauled to a septage receiving facility approved by the City of Shepherdsville. A waste hauler must be permitted by the Board of Health and registered with the City of Shepherdsville in order to dispose of waste at the SRF. It is the Contractor's option and responsibility to make arrangements for disposal of 3% - 5% solids, by volume, in the manner and pay all associated costs and fees; the Contractor may handle this bio-solids component in the same manner described in Paragraph (E) below.
- (E) All Other Bio-solids and Grit: Bio-solids and grit which remain in liquid holding tanks or lagoons shall be dewatered using portable dewatering equipment located on-site. The liquid by-product from the dewatering process can be returned to the newly constructed and approved City of Shepherdsville sanitary sewer system. The Contractor shall use shovels, brooms and/or other appropriate methods to assure that residual grit and/or bio-solids are removed from corners and hard to reach areas of holding tanks and treatment vessels. For lagoons, the

Contractor shall remove all grit and bio-solids down to residual earth or synthetic liner, and stabilize the earth/liner area with hydrated lime to a pH of 10.0 or greater. The dewatered bio-solids material shall then be transported to an approved landfill site.

The Contractor shall be aware that the landfill receiving the dewatered material may randomly sample the material at the landfill and perform filter laboratory testing. If the dewatered material does not pass this test, the landfill will reject the material and not allow its disposal at the landfill. In addition, any evidence of free water in the material will also result in its rejection by landfill personnel. In either case, additional dewatering of the rejected material will be the Contractor's responsibility prior to acceptance and disposal at the landfill.

The Contractor shall have a maximum of 30 days to dewater and/or remove all bio-solids and grit from the facility beginning at the time of wastewater influent flow diversion. During this 30-day time frame, the Contractor is responsible for controlling odors emanating from the facility.

- (F) Utility Disconnection: Disconnect the existing utility services in accordance with the appropriate utility company's recommendations. Utility disconnection shall not occur until all bio-solids and grit materials have been dewatered and/or removed from the facility.

Once the facility is taken out of service, and the steps outlined in Sections (A) through (F) are complete, the Contractor shall provide written notification to the City of Shepherdsville that the facility is prepared for equipment salvage. Unless otherwise directed by the City of Shepherdsville, the Contractor shall then vacate the facility site for a period of time as specified in the special provisions to allow equipment salvage by the City of Shepherdsville or the Owner.

The Contractor is encouraged to supplement any information about the WWTP site, components and waste constituents provided by the Contract, with his own on-site evaluation.

The Contractor shall be responsible for obtaining all demolition and transportation permits, their attendant costs, and all costs associated with pre-bid investigation, removal and disposal of the sanitary wastewater bio-solids and grit material.

5.3.2.3 Existing Facility Demolition and Closure

At the end of the salvage period, the Contractor shall remobilize at the site, stabilize any remaining residual solids with hydrated lime to a pH of 10.0 or greater and proceed with demolition. For the liquid holding tanks that have been stabilized and are to be left-in-place, the Contractor shall break holes in

the bottom of the below grade structures for groundwater pressure relief and demolish/remove the structure(s) to a minimum of 3 feet below finished grade. The remaining void spaces within the structures shall be backfilled with a sand material to 3 feet below finished grade, and then backfilled with select topsoil fill material to finish grade as shown on the Contract. The above-grade structures located at the WWTP facilities and not identified on the Drawings or in the Specifications as "To Remain" or "Do not Disturb" shall also be demolished/removed to a minimum of 3 feet below finished grade and backfilled as described above. For lagoons, the Contractor shall backfill the entire lagoon area with select fill material, as approved by the City of Shepherdsville, and mechanically compact the material to 90% Standard Proctor maximum dry density in accordance with Section 3 of these Specifications. All disturbed areas shall be graded to provide positive drainage; and shall be seeded, fertilized and mulched in accordance with Section 9 of these Specifications.

5.3.3 Connections.

The Contractor shall verify the exact locations and elevations of existing structures or sewers prior to construction and any differences between actual and plan locations and elevations shall be brought to the attention of the City of Shepherdsville before proceeding with the Work. If a bulkhead opening of adequate size or a stub of proper size, elevation, location and direction exists, the connection shall be made as required for normal pipe laying.

For sanitary sewer pipe greater than 12-inches and all drainage pipe an opening may be saw cut in the structure to permit inserting the pipe at the required elevation, direction, and slope. The circumference of the opening shall be sawed to allow approximately two inches of space between the inserted pipe and the structure. Care shall be used to avoid unnecessary damage to existing concrete or brick masonry. All loose material shall be removed from the cut surfaces and the cut surfaces shall be completely coated with non-shrink grout. Before setting the pipe, a sufficient thickness of grout shall be placed at the bottom and sides of the opening for proper bedding of the pipe. After setting the pipe, all spaces around the pipe shall be solidly packed and filled with non-shrink grout which shall be neatly pointed up on the inside to present a smooth joint, flush with the inner wall. When making connections to existing stubs, approved pipe adapters shall be used. Manholes for sanitary sewer pipe that is 12" and smaller shall be core drilled and provided with approved connectors. Modifications to the existing invert shall be made as needed to provide a smooth plastered channel to accommodate the flow from the new pipe.

When reconstruction of a manhole is required, entry into the manhole shall be at the elevation indicated on the Plans or at the invert of the manhole. Entries shall not be allowed on top of the wash unless otherwise directed.

5.3.4 Manholes and Wetwells

Manholes shall be neatly and accurately built in accordance with the Plans and the City of Shepherdsville's Standard Drawings. Precast manhole and wetwell bases, when used for sanitary sewer manholes and wetwells, shall be supplied with watertight sewer pipe connections. When the manhole base slab will consist of cast-in-place concrete, the sewer pipe and the lower precast barrel section shall be in place and supported by concrete blocks prior to placing concrete for the slab. All rough openings between pipes and precast sections shall be thoroughly and completely filled with non-shrink grout, applied so that there will be no leakage around pipes. The grout shall be finished smooth and flush with the interior and exterior manhole or wetwell wall surfaces. Field modifications will be allowed to precast structures if approved by the City of Shepherdsville Inspection. When core drilling is not possible, saw cutting shall be performed when modifying an existing structure.

Manhole inverts shall consist of Class A concrete, placed to conform to the shapes indicated on the City of Shepherdsville's Standard Drawings. Inverts shall include both channel and wash sections with channels so constructed as to create the least resistance to flow. A smooth, uniform dense finish shall be required. Inverts may be either precast or cast-in-place. Joints between precast manhole sections shall be sealed with approved flexible plastic gaskets (type B), rubber gaskets (type A), or rubber O-rings. Flexible plastic gaskets (type B) will not be allowed for use in sanitary sewer installations. The minimum size of flexible plastic gaskets shall be 1-1/2 inch in diameter. Joint sealant materials shall be of the sizes recommended by the manufacturer to provide watertight seals between precast manhole sections. When requested, the Contractor shall furnish information showing that the sizes of the joint sealants being supplied meet the manufacturer's recommendations. When indicated on the Plans, provisions for future sewers shall be provided at manholes by providing 12 inch long stubs of the sizes, lines and grades shown. The upstream ends shall consist of the bell or spigot ends, and they shall be sealed with removable stoppers or bulkheads. If the specified length of any stub is exceeded, it shall be at no additional cost to City of Shepherdsville, unless the extra length is ordered by the City of Shepherdsville. Drop inlets shall be constructed at manholes where indicated on the Plans as per the City of Shepherdsville standard drawings. Manhole barrel sections shall be supplied with openings for upper and lower inlet pipes. The annular spaces between the inlet pipes and the manhole walls shall be filled with non-shrink grout. Grout shall be finished smooth and flush with the adjoining interior and exterior manhole wall surfaces. Encasement of the outside drop pipe shall be with Class B concrete. In case of precast, concrete encasement shall be doweled with reinforcing steel and shall extend a minimum of 2 L.F., or to the undisturbed soil.

Manhole frames shall be placed in the positions shown on the Standard Drawings and shall be set to the correct elevations or adjusted to match final grade. Frames shall be set concentrically with the precast concrete collars and in beds of grout or Butyl resin (i.e. rubber gaskets, type B) may be used when the remaining annular space is filled with grout so that the spaces between the collars and the bottom flanges of the frames shall be completely filled and made watertight. Bituminous mastic and grout shall extend to the outer edges of the masonry and shall be finished smooth and flush with the tops of the flanges. Frames shall be anchored in the concrete collars and anchors

placed. A frame shall not be disturbed until the grout has hardened to adequate strength.

Chimney seals are required on all manhole frames. Chimney seals should be installed on the inside and shall be installed after paving and restoration procedures. Chimney seals should be designed to prevent leakage of water for a life of 25 years. The chimney seals shall extend from the frame to the manhole, covering all collars. Expansion bands shall have a minimum adjustment range of 2 diameter inches. The one piece expansion bands used to compress the sleeve against the manhole shall be a minimum 16 gauge stainless steel conforming to ASTM A-240, Type 304, with a minimum width of 1.75 inches. The rubber sleeve shall be molded from high grade rubber compound conforming to the applicable requirements of ASTM C-923. The sleeve shall have a minimum 1500 psi tensile strength, maximum 18% compression set and a hardness of 48(+/-)5.

Vacuum testing of the sanitary sewer manholes and wetwells are required prior to acceptance by the City of Shepherdsville. A vacuum of 10" Hg should be placed on the manhole, and the time measured for the vacuum to drop to 9" Hg shall be as follows:

60 seconds for 48"
75 seconds for 60"
90 seconds for 72"

This test will be performed on all manholes by the contractor and witnessed by the City of Shepherdsville's personnel.

In the event of initial failure, manholes must be repaired accordingly to achieve desired results.

Persons wishing to have the City of Shepherdsville's Sewer Department assume responsibility of newly installed manholes can contact City Hall at 502-543-2923.

5.3.5 Small Structures

Inlets, catch basins, drains, junction structures, and other small structures shall be neatly and accurately built in accordance with the Plans and the City of Shepherdsville's Standard Drawings. The structure shall be either of cast-in-place concrete or of precast concrete, provided the precast sections have been approved by City of Shepherdsville. Inlet and outlet pipes shall be cut off flush with the inside surfaces of the wall. Pipe bells shall not be allowed inside the structure wall. The pipes shall intersect at the structure so that the invert channel between the inlet and outlet pipes can be smoothly formed. Invert channels shall be of Class A concrete and shall conform to the shapes indicated on the Plans, City of Shepherdsville's Standard Drawings, or as otherwise directed. The invert channels shall be so constructed as to cause the least possible resistance to flow. The shapes of the invert channels shall conform uniformly to inlet and outlet pipes. Smooth and uniform finishes will be required. All inlets, and junction structures deeper than 4 feet, as

measured from the top of the rim or frame to the invert of the structure, shall be provided with steps unless otherwise shown on the Plans or directed by the City of Shepherdsville.

Steps shall be spaced not more than 12 inches vertically and shall be so arranged that the lowest rung shall not be more than 12 inches above the bench, and the top rung shall be 18 inches below the structure rim or frame. The steps shall be arranged out of alignment of the flow channel, and shall be centered horizontally of the grate or lid opening.

All cast-in-place structures shall be built using Class A concrete. The structures shall be built on prepared foundations and conform to the dimensions and shapes shown on the Plans and the City of Shepherdsville's Standard Drawings. The construction shall conform to the methods, forms, placement, protection, and curing for concrete as specified in Section 6 of these Specifications.

Any required reinforcement shall be of the kind, type, and size and shall be located, spaced, bent, and fastened as shown in the Plans and the City of Shepherdsville's Standard Drawings. Installed concrete reinforcing shall be approved by the City of Shepherdsville before any concrete is placed.

Connections for inlet and outlet pipes shall conform to the sizes, alignments, and elevations shown on the Plans. The sealing around pipes for small sanitary sewer structures shall conform to Subsection 5.3.2. of these Specifications.

Waterstops shall be required at construction joints for cast-in-place sanitary sewer structures. Waterstops shall be installed and securely held in place during concreting, in accordance with the manufacturer's recommendations.

Precast sections may be used in the construction of small structures provided that such sections have been approved by the City of Shepherdsville.

No sledge hammer modifications are allowed to precast structures. Saw cuts should be utilized when modifying an existing structure.

When shown on the Plans, cast iron grates and lids shall be attached to the frames, or to the concrete in the event there are no frames, with chains of sufficient lengths to permit moving for clean out and maintenance purposes.

5.3.6 Concrete Box Culverts, Retaining Walls and Headwalls

5.3.6.1 Footings

Footings shall be constructed to the elevations shown on the Plans, but such depths may be increased when it is determined by the City of Shepherdsville that the increases are necessary to provide sufficient bearing or to prevent undermining. Footing elevations should only be raised when solid rock is encountered at elevations above those shown.

The outside faces of all footings of concrete headwalls for pipe, box, or arch culverts shall be formed to full depths of the footings. Whenever the natural foundation material is insufficiently stable to support the structure or whenever it is anticipated that high water may cause excessive erosion around the footings, the City of Shepherdsville may order extra Work performed as necessary to provide the structure with adequate support or protection.

5.3.6.2 Culvert Inverts, Aprons, Curtain Walls, and Headwalls

All culverts, except those founded on solid rock, shall be constructed with a substantial concrete slab through the invert or stream bed. This slab shall terminate at each end of the culvert in apron walls, curtain walls, or cutoff walls carried to a depth that will eliminate danger of undermining. Inverts for concrete culverts shall be paved with a reinforced concrete slab, unless otherwise directed.

Apron or cutoff walls shall, in general, be carried down at both ends to the depths shown, but may be ordered to additional depths necessary to prevent undermining. The outside faces of inlet and outlet concrete aprons or cutoff walls for single span or multiple span culverts shall be formed for the full depths of the aprons or cutoff walls.

The City of Shepherdsville may direct the space between wings to be paved. In this event, the apron walls will extend in a straight line between the ends of the wings, or at such locations as may afford the best protection.

When headwalls for pipe culverts are located at the shoulder of a road, the tops of the headwalls shall be parallel to the shoulder line for both line and grade. When shown on the Plans, the KTC Standard Drawings for pipe culvert headwalls list dimensions from the face of concrete to steel reinforcement as clear distances and dimensions for bar spacings as center to center of bars.

Otherwise, the City of Shepherdsville's Standard Drawings shall be used for determining the sizes and reinforcing steel requirements. Precast concrete pipe headwalls shall conform to the requirements of Subsection 5.2.5. of these Specifications.

When weep holes are required they shall be PVC lined, in accordance with Sec. 610.07 of the KTC Standard Specifications, and shall be incidental to construction of the structure.

Surfaces shall be finished in accordance with the requirements of Section 601.26 of the KTC Standard Specifications or as directed by the Engineer.

5.3.6.3 Retaining Walls

Gravity type or non-reinforced retaining walls shall be constructed of Class B concrete and shall be constructed as shown on the Plans. Reinforced concrete retaining walls shall be constructed of Class A concrete and shall be constructed as shown on the Plans.

5.3.6.4 Placing Concrete

Concrete shall be placed as specified in Section 6 of these Specifications. The base slab or footing shall be placed and allowed to harden before the remainder of the structure is constructed. When shown on the Plans or directed by the City of Shepherdsville, suitable provisions shall be made for bonding the walls to the base by means of longitudinal keys formed by insertion and subsequent removal of beveled timbers. Base slabs, footings, and apron walls shall be constructed as monolithic units, when practicable. When construction joints are necessary, they shall be placed at right angles to the culvert barrel or retaining wall and suitable provision shall be made for bonding adjacent sections by means of keys formed by beveled timbers.

Before concrete is placed in the walls, the footings shall be thoroughly cleaned of all debris, or other extraneous material and the surface carefully chipped and roughened in accordance with the method of bonding construction joints, as specified under Section 6 of these Specifications.

In the construction of all box culverts having a clear height of 5 feet or more, concrete in the side walls shall be placed and allowed to set before the top slab is placed.

For culverts having a clear height of less than 5 feet, the culvert may be poured monolithic when the Contractor so desires. When this method of construction is used, any necessary construction joints shall be vertical and at right angles to the axis of the culvert.

Each wingwall shall be constructed as a monolithic unit. Construction joints, where unavoidable and when not shown, shall be horizontal.

5.3.6.5 Placing Fill

Surfaces shall be finished in accordance with the requirements of Section 601.26 of the KTC Standard Specifications. Backfill or embankment shall not be placed against culverts, retaining walls, and headwalls until permission is given by the City of Shepherdsville. Backfill and embankment shall be constructed as specified in Section 3 of these Specifications.

5.3.7 Adjusting Manholes and Catch Basins

All frame height and alignment adjustments shall be subject to field inspection by the City of Shepherdsville and be subject to correction as directed by the City of Shepherdsville.

Concrete brick (conforming to ASTM C-55 for Type II Grade 5) may be used when adjusting the casting no more than 4 inches.

Precast concrete riser rings may be used when the casting is raised more than 4 inches or when total combined height of existing and proposed exceeds 4 inches. If the concrete riser ring height will exceed 12 inches, use 1 ft. barrel sections. Use the least number of standard size rings as required for proper grade.

All workmanship shall be first class and in conformity with the City of Shepherdsville Specifications.

No wood shims, wood blocks or shot rock shall be used to adjust or reset the frame height.

In pavement, the excavated area around the manhole or catch basin that is raised shall be backfilled with a minimum of 8 inches Class "A" concrete to a level 2 inches below the new top of grate or lid elevation. The remaining 2 inches shall be paved with Class "I" Bituminous concrete surface.

Prior to raising manhole or catch basin frames, the Contractor, Design Engineer, and the City of Shepherdsville representative shall inspect for damaged frames and grates or lids. Damaged frames, grates or lids shall be replaced by the Contractor at no expense to the City of Shepherdsville unless item was damaged prior to start of construction.

5.3.8 High Density Polyethylene (HDPE) Grade Adjustment Rings

Plastic adjustment rings shall be manufactured from polyethylene plastic as identified in ASTM D 1248 (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 D 1248. Recycled material meeting the above requirement may be used.

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SECTION 6

THE CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS

CONCRETE

6.1 DESCRIPTION OF WORK

Concrete shall consist of a mixture of Portland cement, fine aggregate, coarse aggregate, and water, with air entertainment as specified, combined in the proportions and mixed to the consistency specified, and shall be formed or cast to dimensions indicated on the Plans or as directed by the City of Shepherdsville. The Contractor shall provide materials, material proportions, equipment, and construction methods that will ensure that concrete produced meets the requirements of these Specifications.

6.2 MATERIALS

6.2.1 Portland Cement Concrete

6.2.1.1 Portland Cement

Portland cement shall meet requirements set forth in ASTM C 150, Standard Specification for Portland Cement, for Type I or Type II cement, and the requirements set forth in ASTM C 595, Standard Specification for Blended Hydraulic Cements, for Type IP cement.

6.2.1.2 Water

Water used in mixing or curing Portland cement concrete shall meet the requirements set forth in Section 803 of the 1998 KTC Standard Specifications.

6.2.1.3 Fine Aggregates

Fine aggregates shall meet the requirements set forth in Section 804 of the 1998 KTC Standard Specifications.

6.2.1.4 Coarse Aggregates

Coarse aggregates shall meet the requirements set forth in Section 805 of the 1998 KTC Standard Specifications.

6.2.1.5 Air-Entraining Admixtures

Air-entraining admixtures shall meet the requirements set forth in ASTM C 260, Standard Specification for Air-Entraining Admixtures for Concrete, except the chloride content shall not exceed one percent by weight.

6.2.1.6. Chemical Admixtures.

Chemical admixtures shall meet the requirements set forth in ASTM C 494; Standard Specification for Chemical Admixtures for Concrete, except the chloride content shall not exceed one percent by weight.

6.2.1.7 Fly-Ash

Fly ash shall meet the requirements set forth in ASTM C 618, Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete, for Class F Fly Ash. The loss on ignition shall not exceed 3.0 percent, except 4.0 percent will be permitted when the uniformity requirements of ASTM C 618 are met.

6.2.2. Concrete Reinforcement

6.2.2.1 Steel Bars

Steel reinforcing bars shall be deformed bars meeting the requirements of ASTM A 615, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement. All bar reinforcement shall be Grade 60 bars. When epoxy coated steel reinforcing bars are used, epoxy coated tie wire shall be required.

6.2.2.2 Welded Steel Wire Fabric

Welded steel wire fabric shall meet the requirements set forth in ASTM A 185, Standard Specification for Steel Welded Wire Fabric for Concrete Reinforcement.

6.2.2.3 Polypropylene Fibers

Fibers shall be 100 percent polypropylene fibers specifically designed for use as concrete reinforcement and shall contain no reprocessed olefin materials. No textile waste materials or other textile products will be allowed. The polypropylene fibers shall meet the following requirements:

	<u>MIN.</u>		<u>MAX.</u>
Melt Temperature	320 F		
Specific Gravity	0.87	-	0.93
Tensile Strength	70	-	110 ksi.
Fiber Fineness	Less than 100 Denier		
Fiber Length	3/4 inch		
Dosage Rate	2 Lbs/Cy		

6.2.3 Curing and Finishing Materials

6.2.3.1 Concrete Curing Materials

Concrete curing materials shall meet the requirements set forth in Section 823 of the 1998 KTC Standard Specifications, for type 1D Clear, Class B.

6.2.3.2 Masonry Coating Materials

Masonry coating materials shall meet the requirements set forth in Section 828 of the 1998 KTC Standard Specifications.

6.3 EXECUTION OF WORK

6.3.1 Care, Storage, and Handling of Concrete Materials

Aggregates, cement, and fly ash shall be furnished, stocked and handled at the plant in accordance with the requirements set forth in Section 601.03 of the KTC Standard Specifications.

6.3.2 Admixtures

Chemical admixtures to improve workability, retard and/or accelerate the time of set shall be used where specified or directed. When not specified or directed for use, these admixtures may be used only upon written permission. Determination of quantities of water-reducing and retarding admixture required to produce the desired results shall be the responsibility of the Contractor. The Contractor shall also establish the quantity of air-entraining admixture necessary to produce a concrete mixture having a net air content, by volume, of 5.5 plus or minus 1.5 percent.

6.3.3 Proportioning

Proportioning of concrete mixtures shall be in accordance with Section 601.03.03 of the 1998 KTC Standard Specifications. For concrete exposed to sewage, the mixture shall contain the necessary proportions of Type II, Type IP, or Type I cement and fly ash to ensure a maximum Tricalcium Aluminate content of 8 percent of the total weight of cementitious materials.

6.3.4 Class of Concrete

The following classes of concrete shall be as specified in Section 601.03.03 of the 1998 KTC Standard Specifications and shall be used in the types of construction designated, unless shown otherwise on the Plans, in the Contract, or directed by the CITY OF SHEPHERDSVILLE. Concrete of all classes and for all uses above grade shall be air-entrained.

6.3.4.1 Class AA Concrete

Class AA concrete shall be used in structural concrete. It shall have a minimum 28-day compressive strength of 4,000 psi, a minimum slump of 2 inches and a maximum slump of 4 inches. For fiber reinforced concrete, a tolerance of ± 1 inch shall be allowed outside the minimum and maximum specified.

6.3.4.2 Class A Concrete

Class A concrete shall be used in cast-in-place sewers, headwalls, catch basins, manholes, small retaining walls, culverts, sidewalks, curbs, driveways, pavements, paved ditches and paved channel linings. It shall have a minimum 28-day compressive strength of 3,500 psi, a minimum slump of 2 inches and a maximum slump of 4 inches. For fiber reinforced concrete, a tolerance of ± 1 inch shall be allowed outside the minimum and maximum.

6.3.4.3 Class B Concrete

Class B concrete shall be used in concrete encasements, caps, cradles, stacks, gravity retaining walls and for all non-reinforced concrete deposited as fill for cavities or voids and mass footings. It shall have a minimum 28-day compressive strength of 2,500 psi, a minimum slump of 3 inches and a maximum slump of 5 inches. For fiber-reinforced concrete, a minimum slump of 2 inches and a maximum slump of 6 1/2 inches is allowed.

6.3.4.4 Class M Concrete

Class M concrete shall be used for high early strength in driveways and sidewalks, when required by the Special Provisions or the plans. It shall meet the requirements for Class M concrete set forth in Section 601.03.03 of the 1998 KTC Standard Specifications.

6.3.4.5 Flowable Fill

Flowable fill shall be used as required by the Special Provisions or the plans. It shall meet the requirements for flowable fill set forth in Section 601.03.03 of the 1998 KTC Standard Specifications.

6.3.5 Batching and Mixing

6.3.5.1 General

The concrete shall be batched and mixed in the quantities required for immediate use. Unless otherwise specified or directed, all concrete shall be manufactured by ready-mixed methods.

6.3.5.2 Ready-Mixed Concrete

Ready-mixed concrete shall be manufactured and supplied in accordance with ASTM C 94, Standard Specification for Ready-Mixed Concrete, Alternate No. 3. The placement shall commence within 60 minutes of batch to trucks as indicated on ticket. The interval between delivery of separate batches placed continuously in the Work shall not exceed 20 minutes unless otherwise permitted by the City of Shepherdsville. Batch tickets with batch weight shown, shall be provided to the City of Shepherdsville when requested.

6.3.5.3 Hand-Mixed Concrete

Hand mixing will not be permitted, except in case of emergency or in case of isolated small units such as pipe headwalls and then only by permission of the City of Shepherdsville. When hand-mixing is permitted, proportioning by volume will be allowed and mixing shall be done only on water-tight platforms. The sand shall be spread evenly over the platform and then the cement spread upon it. The sand and cement shall then be thoroughly mixed while dry by means of shovels until the mixture is of a uniform color, after which it shall be formed into a crater and water added in an amount necessary to produce mortar of the proper consistency. The total water content shall not exceed that specified in Section 601.03.03, of the 1998 KTC Standard Specifications. The material on the outer portion of the crater ring shall then be shoveled to the center and the entire mass turned and sliced until a uniform consistency is produced.

The coarse aggregate shall then be added to the mortar and the entire mass turned and re-turned at least 6 times and until all coarse aggregate particles are thoroughly coated with mortar and the mixture is of a uniform color. Hand-mixed batches shall not exceed 1/2 cubic yard.

6.3.6 Forms

6.3.6.1 General

All forms shall be mortar-tight, true to the dimensions, lines, and grades of the structure, and of sufficient strength to prevent appreciable deflection during placing concrete. Aluminum or aluminum alloy forms will not be permitted except when provision is made to prevent their direct contact with the concrete, or be detrimental to masonry coating if the surface will be coated.

The inside surfaces of forms shall be cleaned of all dirt, mortar, and foreign material. Forms, which will later be removed, shall be thoroughly coated with form oil, prior to use. The form oil shall be a commercial quality form oil or other equivalent coating which will permit ready release of the forms and will not discolor the concrete, or be detrimental to masonry coating if the surface will be coated.

Concrete shall not be deposited in forms until all Work connected with constructing the forms has been completed, all materials required to be embedded in the concrete have been placed for the unit to be poured, and the City of Shepherdsville has inspected forms and materials. Such Work shall include removal of all dirt, chips, sawdust, water, and other foreign material from the forms.

Forms for all concrete surfaces, which will not be completely enclosed or hidden below the permanent ground surface, shall conform to the requirements herein for forms for exposed surfaces. Interior surfaces of underground sewers and structures will be considered to be completely enclosed surfaces.

Forms for exposed concrete surfaces shall be designed and constructed so the formed surfaces of fasteners, or wales. Plywood forms shall be at least 3/4 inch thick and shall be placed with the face grain perpendicular to the studs or joists, unless the Contractor furnishes calculations showing that excessive deflection or stresses will not occur when the grain is parallel to the studs or joists. The clear span between supporting studs or joists shall be placed no more than 20 times the thickness of the form facing and in no case shall the deflection exceed 1/360 of the clear span. Should any form or forming system, even though previously reviewed prior to use, produce a surface with excessive undulations, its use shall be discontinued until modifications satisfactory to the City of Shepherdsville have been made.

All exposed surfaces of each element in a concrete structure shall be formed with the same forming material or with materials which produce similar surface texture, color, and appearance.

Forms for exposed surfaces shall be faced with form panels. A form panel shall be considered to be the continuous section of form facing material, unbroken by joint marks, against which concrete is placed.

Form panels for exposed surfaces shall be plywood conforming to the requirements of U. S. Product Standard PS-1 for Exterior B-B (Concrete Form) Class I Plywood or any material other than plywood which will produce a smooth uniform concrete surface substantially equal to that which would result from use of such plywood. Only form panels in good condition, free of defects, such as scars, dents, or delaminations, shall be used for exposed surfaces.

Form panels for exposed surfaces, in general, shall be furnished and placed in uniform widths of 3 feet or more and in uniform lengths of 5 feet or more, except where the dimensions of the member formed are less than these dimensions. Panels shall be arranged in symmetrical patterns conforming to the general lines of the structure. Form panels on each side of the panel joint

shall be precisely aligned, by means of supports or fasteners common to both panels, to result in a continuous, unbroken concrete plane surface.

Forms for exposed surfaces shall be constructed with chamfer strips no less than 3/4 inch by 3/4 inch attached to prevent mortar runs and to produce smooth, straight chamfers at all sharp edges of the concrete.

Form fasteners consisting of form bolts, clamps, or other devices shall be used as necessary to prevent spreading of the forms during concrete placement. The use of ties consisting of twisted wire loops to hold forms in position will not be permitted.

Metal ties or anchorages within the form shall be constructed to permit their removal to a depth of at least one inch from the face without injury to the concrete. All fittings or metal ties shall be of such design that upon their removal the cavities, which will remain, will be the smallest possible size. Cavities, regardless of their position in the completed construction, shall be rammed and filled with mortar and the surface shall be sound, smooth, even, and uniform in color.

For narrow walls where access to the bottom of forms is not readily attainable otherwise, the lower form boards shall be left loose so they may be removed for removal of all chips, dirt, sawdust, or other extraneous material immediately prior to placing concrete.

Forms which are intended for re-use shall be maintained in good condition to ensure accuracy of shape, strength, rigidity, water-tightness, and surface smoothness. Forms that are unsatisfactory in any respect in the opinion of the City of Shepherdsville shall not be used and shall be removed immediately from the job site.

6.3.6.2 Removal of Falsework and Forms

In determination of the time for removal of falsework and forms, consideration shall be given to the location and character of the structure, weather, and other conditions influencing hardening of the concrete and materials used in the mixture. Removal of falsework and forms shall be done in accordance with 1998 KTC specifications, Sections 601.03.14 and 601.03.15 unless otherwise directed by the City of Shepherdsville.

Forms shall be removed with care so as not to damage the surface of the concrete structure and shall be the sole responsibility of the Contractor.

6.3.7 Concrete Reinforcing

6.3.7.1 Protection of Steel Reinforcing

Proper care shall be used in handling and storing steel reinforcement or epoxy coated steel reinforcement to prevent bending, excessive rusting, or coating with objectionable substances. Steel reinforcement, when incorporated in the Work shall be reasonably free from dirt, paint, oil, grease, loose/thick rust, and other foreign substances, and when deemed necessary, shall be cleaned to the satisfaction of the City of Shepherdsville.

6.3.7.2 Bending Steel Reinforcing Bars

Steel reinforcing bars shall be bent cold. Bars shall be bent accurately to the dimensions and shapes shown on the Plans and to within tolerances designated in the CRSI Manual of Standard Practice. Bars shall be bent in the shop before shipment and shall not be bent in the field, unless otherwise directed by the City of Shepherdsville.

6.3.7.3 Placing and Fastening

All steel reinforcement shall be accurately placed in positions shown and firmly held in position during placement and hardening of concrete. All steel reinforcement, shall be spaced to within a tolerance of plus or minus 1/2 inch and placed to within a tolerance of plus or minus 1/4 inch of specified clearance from the face of concrete. Dimensions shown from the face of concrete to bars are clear distances. Bar spacings are from center to center of bars. Bars shall be tied at all intersections, except where spacing is less than one foot in both directions, then alternate intersections shall be tied. Epoxy coated steel reinforcement shall be tied with coated tie-wire.

Distances from forms shall be maintained by means of stays, blocks, ties, hangers, or other approved supports. Supports for holding reinforcement from contact with the forms shall be approved precast blocks composed of mortar or approved metal chairs. The tips of metal chair supports, which are in contact with the surface of the concrete, shall be plastic-coated steel. The steel placed in reinforced concrete slabs shall also be securely tied down to prevent any possibility of steel rising above the specified elevation during placing, vibrating, and finishing the concrete.

The top mat and bottom mat of bars shall be separated by precast mortar blocks or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe, and wooden blocks shall not be permitted as separators. Reinforcement in any member shall be securely placed and then inspected and approved before the placing of concrete begins. Concrete placed in violation of this provision may be rejected.

6.3.7.4 Splicing

No splicing of reinforcement will be permitted, except those splices of the types and at the locations shown, without written permission from the City of

Shepherdsville. Acceptable splices may include lapped splices, welded splices, mechanical splices, or other positive connection splices shown on the Plans or directed by the City of Shepherdsville.

Lapped splices, shall have lengths of not less than 40 times the nominal diameters of the reinforcement being spliced, unless otherwise shown on the Plans. Lapped splices in areas not designated on the Plans shall be made at points of low tensile stress, and the bars being spliced shall be rigidly clamped or wired together in an approved manner.

Rolls of welded steel wire mesh shall overlap each other by 2 cells, to maintain a uniform strength, and shall be securely fastened at the ends and edges.

Welded splices shall be in conformance with the AWS Reinforcing Steel Welding Code, current edition. Bars to be welded shall be butted and welded so as to develop, in tension, at least 125 percent of the specified yield strength of the bars. Welded splices will not be permitted unless shown on the Plans or approved by the City of Shepherdsville.

6.3.7.5 Fiber Reinforcing

When fiber reinforcing is required by the Plans or Contract, the polypropylene fibers shall meet article 6.2.2.3 requirements. The fibers shall be added after other ingredients have been placed in the mixer and prior to leaving the batch plant. Each batch delivery ticket shall indicate the amount of fibrous concrete reinforcement material per cubic yard added to each batch of concrete. Wire mesh reinforcement shall not be used in conjunction with fiber reinforcement.

6.3.8 Placing Concrete

6.3.8.1 General

Unless other provisions are agreed upon, the contractor shall give the City of Shepherdsville inspector 48-hour advance notice before concrete placement.

Concrete shall be delivered to its final position of placement within the time required for delivery after mixing in accordance with ASTM C 94 and within the required time interval between delivery of batches as specified in Section 6.3.5.2. Forms and reinforcement shall be moistened with water immediately before placing the concrete.

All equipment used for handling and/or placing concrete shall be such that it will accommodate concrete of the proportions and consistencies as specified. No adjustments in mixture proportions will be made to accommodate equipment, which is not capable of handling concrete of specified proportions

and consistencies. Equipment used to transfer concrete from truck mixers or agitators shall be of adequate design and/or dimensions to deposit concrete of the specified slump.

Water shall be completely removed from all excavations before concrete is deposited. When it is necessary to deposit concrete under water, placement shall be in accordance with the requirements specified under Section 601.03.09, Part B of the 1998 KTC Standard Specifications. The City of Shepherdsville's approval must be obtained prior to placing concrete under water.

In general, concrete shall not be placed unless otherwise shown on the Plans or directed by the City of Shepherdsville.

The method and manner of placing concrete shall be such as to avoid segregation or separation of aggregates or displacement of reinforcement. The use of long chutes, troughs, belts, and pipes for conveying concrete from the point of delivery to the forms will be allowed only upon written permission. When such conveyers are allowed and the quality of concrete or methods of placing or working it therein are not satisfactory, the Contractor shall discontinue their use and equip his plant so that concrete will be placed in a satisfactory manner. Troughs, pipes, or chutes used as aids in placing concrete shall be arranged and used in such a manner that ingredients of the concrete are not separated.

Where steep slopes are required, the chutes shall be equipped with baffle boards or be in short lengths that change the direction of movement. All chutes, troughs, and pipes shall be maintained clean and free from coating of hardened concrete by thoroughly flushing with water after each run or when out of operation for more than 30 minutes. Water used for flushing shall be discharged clear of concrete in place. The troughs, pipes, and chutes shall be either metal or metal-lined and shall extend as nearly as possible to the point of deposit. Aluminum or aluminum alloy troughs, pipes, or chutes will not be permitted.

Dropping concrete in excess of 5 feet without the use of pipe or tremies, or depositing a large quantity at any point and running or working it along the forms will not be permitted. The discharge end of the pipe shall be maintained as close to the point of deposit as is feasible. Concrete placing shall be such to entirely fill but not bulge or distort the forms or to disturb their alignment.

Special care shall be exercised to fill each part of the forms by depositing concrete as near its final position as possible, to work the coarser aggregate back from the face and to force concrete under and around reinforcing bars without displacing them. After concrete has taken its initial set, care shall be

exercised to avoid jarring the forms or placing any strain on ends of projecting reinforcement.

Concrete shall be compacted either by vibration as described herein or with approved spading tools. When vibration or spading is used, it shall be distinctly understood that formation of honeycombs, voids, or air pockets against the forms will not be allowed.

Vibration shall be internal. Vibrators shall be of types and designs capable of transmitting vibration to the concrete at frequencies to adequately consolidate the concrete. Vibration shall be of sufficient intensity and duration to cause flow or settlement of the concrete and complete compaction, but shall not be used to cause concrete to flow over long distances in the forms. The Contractor shall provide and use a sufficient number of mechanical vibrators to ensure that compaction can be started immediately after concrete has been deposited in the forms. The mechanical vibrator shall not be attached to the forms or reinforcing steel or applied to the surface of the concrete. The vibrator shall be applied to the concrete immediately after deposit of the concrete and shall be moved throughout the mass, thoroughly working the concrete around the reinforcement, embedded fixtures, and into angles and corners of the forms.

Vibration shall be of such duration to accomplish thorough compaction and complete embedment of reinforcement and fixtures, but shall not be unduly prolonged to cause segregation or undesirable laitance at the surface of the lift being consolidated. Forms shall be designed to provide for requirements of vibration.

Concrete shall be placed in continuous horizontal layers, the thickness' of which shall not exceed 12 inches, unless otherwise specified for different types of structures. In any given layer, consecutive batches shall be placed and compacted before the preceding batch has taken its initial set. Each layer of concrete shall retain a rough surface in order to secure efficient bonding with the next layer. A succeeding layer placed before the underlying layer has set shall be compacted in a manner that will entirely break up and obliterate the tendency to produce a cold joint between layers.

The operations of depositing and compacting concrete shall be conducted to form a compact, dense, and impervious mass of uniform texture having smooth faces on exposed surfaces. When any section of concrete is defective, it shall be removed and satisfactorily replaced or repaired as directed.

6.3.8.2 Weather Limitations and Protection

Concrete shall be maintained at a minimum temperature of 45°F for three calendar days after placement and at a minimum temperature of 40°F for an

additional four calendar days. When required, the Contractor shall submit a written outline of the method to be used for protecting concrete. The Contractor shall designate one of his employees to be responsible in order that he may be contacted by the City of Shepherdsville in unexpected situations. The City of Shepherdsville reserves the right to discontinue concrete placement when the means of protection and/or method of placement do not produce satisfactory results.

In cold weather, 40°F or below, all water and/or aggregate shall be heated so the temperature of the mixed concrete shall be no less than 50°F or more than 90°F at the time of placement.

When artificial heat is used, means shall be provided to maintain adequate moisture in the air within the enclosure. Surfaces of all concrete shall be maintained in a moist condition. When artificial heat is used, the temperature of concrete near the source of heat shall not exceed 80°F, and the temperature of concrete remote from the source of heat shall not be less than that designated (45°F or 40°F) for the time of curing after placement. When stoves or salamanders are used, adequate provisions shall be made for fire protection.

In hot weather, efforts shall be made to maintain temperature of the mixture below 90°F. The temperature of the concrete mixture immediately before placing shall be between 50°F and 90°F. When the ambient air temperature is above 90°F, the forms, reinforcing steel, and other surfaces which will come in contact with the mixture shall be cooled to below 90°F by means of a water spray or other approved methods. Excess water shall be allowed to drain or shall be removed from the forms before concrete is placed.

The Contractor shall assume all risks connected with placing concrete under these conditions and permission given by the City of Shepherdsville to do the Work will in no way relieve the Contractor of responsibility for proper results. Should concrete placed under such conditions prove unsatisfactory, it shall be removed and replaced with satisfactory concrete and no allowance will be made for removing and replacing the defective concrete.

6.3.9 Curing Concrete

6.3.9.1 General

All surfaces, which are to receive a masonry coating finish, shall be wet-cured. All other concrete, shall either be wet-cured or shall be cured by application of a membrane forming compound.

At any time the City of Shepherdsville determines concrete on the Project is not being properly cured, all or any concreting operations on the Project may be suspended.

At any time during the curing period when the atmospheric temperature is 45°F or less, the concrete shall be protected so as to satisfy the temperature requirements specified in Subsection 6.3.8.2. of these Specifications.

6.3.9.2 Wet Curing

Concrete shall be cured for a period of at least seven calendar days, beginning immediately after placement and finishing, by the frequent application of water to all surfaces so as to keep them continuously damp during the full seven-calendar-day curing period. Exposed concrete surfaces shall be protected from drying by application of a double thickness of wet burlap or similar material and the burlap or other approved material shall be kept continuously wet for a period of seven or more calendar days.

When the structure or any portion thereof is enclosed and artificial heat is provided for protection, the requirement of moisture for curing will not be waived. When steamlines are used for heating, the pipe shall be left loose so as to permit the escape of sufficient steam into the housing in order to maintain a moist atmosphere at all times. When stoves or salamanders are used, vessels containing water shall be maintained on each stove or salamander to maintain a moist atmosphere at all times.

6.3.9.3 Membrane Curing

The membrane forming curing compound shall not be diluted or altered prior to use, but shall be thoroughly agitated immediately prior to use. When the compound is too viscous for application, it shall be warmed in a water bath to approximately 100°F prior to application.

The compound shall be uniformly applied to a surface by use of an approved pressure sprayer. Curing compound may be applied in one application provided uniform and satisfactory coverage is achieved. If the City of Shepherdsville directs that two applications are required because one application is not satisfactory, then each application shall be at the rate of one gallon per 300 or less square feet. The first application shall be started as soon as practicable after the final finish and as directed by the City of Shepherdsville and the second application shall be started as soon as the first application is finished. The total actual application rate shall be at least one gallon per 150 square feet actual coverage.

Curing compound shall not be applied to construction joints, reinforcing steel, or surfaces, which are to receive a masonry coating. When curing compound is applied to surfaces upon which the compound is not permitted for use, it shall be removed by sandblasting.

The curing compound shall be protected and maintained in an acceptable condition for a period of at least seven calendar days. Surfaces upon which the curing compound is damaged before the end of the seven-calendar-day curing period shall be moistened and resprayed with curing compound.

6.3.10 Surface Finish

6.3.10.1 General

Unless otherwise indicated on the Plans, the surface finish that shall be applied to various parts of concrete structures shall be as follows:

Ordinary,
Masonry Coating Finish, or
Floated Surface Finish.

Ordinary Surface Finish shall be applied to all concrete surfaces. Unless otherwise specified in the Contract, and provided requirements here in are satisfactorily met, ordinary surface finish shall be considered as a final finish on all surfaces not required to have a Masonry Coating Finish or a Floated Surface Finish.

6.3.10.2 Ordinary Surface Finish

During concrete placement, care shall be taken that methods of compaction used will result in a smooth surface of even texture free from honeycombs, water, and air pockets, and that the coarse aggregate is forced away from the forms in order to leave a mortar surface.

As soon as the concrete has set sufficiently, the forms shall be carefully removed and all metal ties, anchorages, or tie wires used within the forms to hold them to correct alignment and location shall be removed as specified in Subsection 6.3.6.2. of these Specifications. Immediately following removal of forms, all fins and irregular projections shall be removed from all surfaces, except those not to be exposed in the completed Work. On all surfaces, cavities and depressions resulting from removal of form ties and all other holes, honeycomb spots, broken corners or edges, and other defects shall be thoroughly cleaned, saturated with water, and carefully pointed and trued with a mortar of the same cement and fine aggregates mixed in the same proportions as used in the class of concrete being finished. The mortar used shall not be more than 30 minutes old and the mortar patches shall be cured as specified for the structures.

After the mortar has thoroughly hardened, it shall be finished with a carborundum stone to obtain a uniform and smooth surface the same color and texture as in the surrounding concrete. When required, honeycomb areas shall be chipped out before pointing. All open and filled contraction and

expansion joints in the completed Work shall be carefully tooled and free of all mortar and concrete. The joint filler shall be exposed for its full length with clean true edges.

The objective of these requirements is to obtain smooth and even surfaces of uniform color and texture without unsightly bulges, patched areas, depressions, and other imperfections. The degree of care in building forms and the character of materials used in form work, and the care with which concrete is placed will be factors in determining whether additional finishing of concrete will be required.

6.3.10.3 Masonry Coating Finish

After the concrete surfaces of members designated to have a Masonry Coated Finish have been inspected and accepted as having a satisfactory Ordinary Surface Finish, the concrete surfaces shall be cleaned of all dust, foreign matter, and form oil, and an approved Masonry Coating Finish shall be applied.

All surfaces to receive a masonry coating shall be thoroughly cleaned and free of oil, form oil, grease, dust, dirt, mud, curing compound, release agents, loose patching mortar, or any other substance deleterious to bonding. The ordinary surface finish to which the masonry coating is to be applied shall be approved by the City of Shepherdsville before application of the masonry coating.

All surfaces to receive a masonry coating shall be checked for the presence of dust by wiping a dark cloth across the surface of the concrete. If a white powder can be seen on the dark cloth, the concrete shall be cleaned by wire brushing, grinding, or water blasting and then allowed to thoroughly dry before the masonry coating is applied. The surface will be rechecked for the presence of dust after cleaning.

All surfaces to receive a masonry coating shall be checked for the presence of oily conditions by sprinkling or fogging water on the surface of the concrete. If the water stands in droplets without spreading out immediately, this indicates the surface is contaminated with an oily substance, and cleaning, using a detergent and water followed by thorough rinsing with water, will be required. The surface will be rechecked for the presence of oily conditions after cleaning.

All surfaces to receive a masonry coating shall be thoroughly dry before coating is applied, unless the coating manufacturer specifically recommends the surface to be wet. Surfaces will not be considered dry unless an absorbent paper pressed tightly against the surface does not show any trace of moisture.

Coating application shall be suspended any time the ambient temperature or the temperature of the concrete does not comply with the coating manufacturer's recommendations.

Prior to application of the materials, the Contractor shall furnish the City of Shepherdsville with copies of the coating material manufacturer's brochures or booklets. Masonry coating materials shall be applied in strict conformity with the manufacturer's written instructions, except that in each instance the concrete surface shall be prepared to the satisfaction of the City of Shepherdsville before application of the material is started and the material shall be applied at a uniform rate of 50 plus or minus 10 square feet per gallon.

Any portions of the coating which are not clean, uniform in color, texture, thickness, tightly bonded, or which are damaged prior to final acceptance of the Project shall be satisfactorily repaired or removed and replaced with an acceptable finish and coating.

Care shall be exercised to secure a neat uniform appearance and to prevent the coating from being dripped, sprayed, or otherwise deposited upon concrete or steel surfaces not designated to receive the coating. Any objectionable deposits or material shall be removed and the surfaces repaired to the satisfaction of the City of Shepherdsville.

6.3.10.4 Floated Surface Finish

Horizontal surfaces that do not receive the Masonry Coating Finish shall be finished by placing an excess of materials in the form and removing or striking off such excess with a wooden template, forcing coarse aggregate below the mortar surface. After the concrete has been struck off as described, the surface shall be thoroughly worked and floated by hand with a wooden float leaving a fine grained, smooth-sanded surface.

Sidewalks and driveways shall receive a broom finish, prior to beginning the curing process.

6.3.11 Sampling and Testing

6.3.11.1 Personnel

Structural concrete, such as foundations and any pour larger than 5 cubic yards, shall be sampled and tests will be performed throughout the work at the minimal frequencies indicated or more often as necessary to determine whether concrete supplied is of the quality specified. Tests will be performed by the Agency designated by the City of Shepherdsville to provide concrete testing on Projects involving the City of Shepherdsville facilities, according to procedures outlined below. On private developments and other than the

City of Shepherdsville advertised Projects, the testing company must be designated in writing and be approved by the City of Shepherdsville prior to concrete placement. If the concrete plant is designated, the City of Shepherdsville may elect to pay for samples to be taken from the same mix in order to run tests in parallel.

The technician who samples and tests concrete shall have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the minimum guidelines for Certification of Concrete Field Testing Technicians, Grade I in accordance with the American Concrete Institute.

6.3.11.2 Sampling Fresh Concrete

Concrete shall be sampled in accordance with the procedures set forth in ASTM C 172, Standard Specification for Sampling Freshly Mixed Concrete.

6.3.11.3 Slump Test

Slump tests shall be performed in accordance with the procedures set forth in ASTM C 143, Standard Test Method for Slump of Portland Cement Concrete.

6.3.11.4 Air Content

The air content shall be determined by the volumetric or pressure methods in accordance with the procedures set forth in ASTM C 173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method, or ASTM C 231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

6.3.11.5 Test Cylinders

Concrete test cylinders shall be made and cured in accordance with the procedures set forth in ASTM C 31, Standard Practice for Making and Curing Concrete Test Specimens in the Field. Unless otherwise specified, four test cylinders shall be molded for each set. Cylinders to be used for determining form removal time shall be stored at the site as near to the concrete being represented as possible.

6.3.11.6 Compressive Strength Tests

The compressive strength of test cylinders shall be determined in accordance with the procedures set forth in ASTM C 39, Standard Test for Compressive Strength of Cylindrical Concrete Specimens.

6.3.11.7 Frequency of Tests

Unless otherwise directed by the City of Shepherdsville, a minimum of one set of test cylinders shall be made daily for each 50 cubic yards or portion thereof placed in each structure. Two cylinders shall be tested at 28 days to check the adequacy of the concrete mix. The remaining cylinders may be tested, as needed, to meet the provisions of Section 601.03.14 of the 1998 KTC Standard Specifications, if early form removal is desired.

Slump and air content tests shall be made at the time of concrete placement as often as is necessary for control checks and acceptance purposes, and always when compressive strength specimens are made. If the measured slump or air content falls outside the specified limits, a check test shall be made immediately on another portion of the same sample. In the event of a second failure, the concrete shall be considered to have failed the requirements of these Specifications. The first and last 1/4 cubic yard discharged from the mixer are exempt from the slump and air content requirements of these Specifications.

SECTION 7

CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS

TUNNELING, BORING AND JACKING

7.1 DESCRIPTION OF WORK

This Work shall consist of the installation of sanitary and storm sewer pipe by tunneling or by boring and jacking in accordance with the provisions of these Specifications and in close conformity to the lines and grades shown on the Plans. All excavation shall be unclassified.

7.2 MATERIALS

7.2.1 Steel Tunnel Liner Plates.

The base metal for steel plates shall conform to the chemical requirements of ASTM A 569, Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality. The flat plate (before cold forming) shall conform to the following minimum mechanical properties:

Tensile Strength	42,000 psi
Yield Strength	28,000 psi
Elongation, 2 inches	30%

Nominal plate dimensions shall provide the sectional properties shown in the current edition of the AASHTO Standard Specifications for Highway Bridges. Thickness tolerances shall conform to Paragraph 14 of AASHTO M 167, Standard Specification for Structural Plate for Pipe, Pipe-Arches, and Arches. Steel liner plates shall be of additional thickness or protected by coatings and other means when required in the Contract for resistance to abrasion or corrosion.

7.2.2 Bolts and Nuts

Bolts and nuts used with lapped seams shall be no less than 5/8 inch in diameter. The bolts shall conform to ASTM A 449, Standard Specification for Quenched and Tempered Steel Bolts and Studs, for plate thicknesses equal to or greater than 0.209 inch and A-307, Standard Specification for Carbon Steel Externally Threaded Standard Fasteners, for plate thickness less than 0.209 inch. The nut shall conform to ASTM A 307, Grade A.

Bolts and nuts used for 4-flanged plates shall be no less than 1/2 inch in diameter for plate thicknesses to and including 0.179 inch and no less than 5/8 inch in diameter for plates of greater thickness. The bolts and nuts shall be quick acting coarse thread and shall conform to ASTM A 307, Grade A.

7.2.3 Steel Casing Pipe

Steel casing pipe shall conform to ASTM A 139, Standard Specification for Electric-Fusion (ARC) Welded Steel Pipe. For 30 inch and greater diameter casing pipe, a minimum clearance of 12 inches (total) must be provided between pipe bells and the inside of the casing pipe, except as otherwise stated in these specifications, or as shown on the Plans. On a case-by-case basis a smaller diameter casing will be allowed if the 12-inch minimum clearance and design grade can be achieved. All storm drains, 8 inch or greater gravity sewers and 10 inch or greater force mains shall use a 30 inch minimum diameter casing pipe. A 12 inch diameter casing pipe shall be used for 6 inch or less gravity sewers and 8 inch or less force mains. The minimum wall thickness and grade of the casing pipe shall be as shown on the Plans. Smaller diameter casing pipes will need to be approved prior to construction.

7.2.4 Cement Grout

Cement grout for filling voids outside tunnel liner plates and 30 inch or larger casing pipe, unless shown otherwise on the Plans, shall consist of a mixture of water and one part Type 1 Portland Cement to two parts mortar sand (as specified in Section 804.05 of the 1998 KTC Standard Specifications), by volume, or KTC 1:2 Proprietary Grout Mix #1093. The water shall be adjusted to produce a mixture of consistency suitable for pumping, with a minimum slump of 5 inches and a maximum slump of 9 inches. Provisions shall be made for releasing of air and filling with grout. A pressure of 10 to 15 PSI (23.0 to 35.0 feet of head) shall be used. Cement grout for filling the voids between the carrier and casing pipe shall be a mixture suitable for grouting and shall be approved by CITY OF SHEPHERDSVILLE prior to its use.

Casing pipe may also be filled with blown in sand or pea-gravel. If a casing pipe less than 30-inches in diameter is used, one of these two methods of filling the voids has to be used. If bore is under a state highway, KTC will need to approve the method.

7.3 EXECUTION OF WORK

7.3.1 General

Sewer pipe shall be constructed by tunneling or boring and jacking only at those locations and within limits shown on the Plans or as directed by the CITY OF SHEPHERDSVILLE. Where pipe is required to be installed under railroads, highways, streets, or other facilities by tunneling or boring and jacking, construction shall be made in such a manner that will not interfere with the operation of the railroad, street, highway, or other facility, and shall not weaken or damage any embankment or structure.

If any utility above or adjacent to the tunnel or bore is endangered or has been damaged because of the tunneling or boring and jacking operations or movements of earth caused by such operations, the owner of same shall be notified immediately and shall be given access to the Work to carry out all necessary repairs to such utilities.

If any sewers are damaged, it shall be the responsibility of the Contractor to make the necessary repairs.

The Contractor shall be responsible for protection of utilities, sewers, and drains against damage by his Work. If any public or private property is endangered, or has been damaged as a direct result of the tunneling or boring and jacking operations, it shall be repaired at the Contractor's expense. All cost and expense to the Contractor for carrying out the above requirements shall be at no additional cost to CITY OF SHEPHERDSVILLE.

7.3.2 Dewatering

Prior to commencing, the Contractor shall furnish and operate all necessary pumping equipment of ample capacity and make all necessary provisions to keep tunnels, shafts and pits free of water during construction and to satisfactorily dispose of such water. During placing of concrete, drainage and pumping shall be so arranged that concrete is placed in the dry and that no water will flow over the concrete until it has hardened.

7.3.3 Line and Grade

Line and grade shall be checked frequently by the Contractor's Professional Land Surveyor and not less than once per day. Results from these checks shall be provided to CITY OF SHEPHERDSVILLE. The Contractor also shall assist the CITY OF SHEPHERDSVILLE in checking line and grade as often as the CITY OF SHEPHERDSVILLE deems necessary to ensure that proper tolerances in line and grade are being met.

Tunneled and bored and jacked sections of sewers shall be completely installed prior to construction of adjoining sections. If permitted by the CITY OF SHEPHERDSVILLE, minor adjustments in the line and/or grade of the adjoining sections shall be allowed to compensate for slight deviations from the Plan line and grade of the installed tunneled sections.

7.3.4 Tunneling

7.3.4.1 Submittals and Approvals

Tunnel support systems shall be with steel liner plates, ribs and lagging, steel casing pipe or other systems approved by the CITY OF SHEPHERDSVILLE. The Contractor shall furnish a detailed Tunneling Plan for review by the CITY OF SHEPHERDSVILLE. The Plans shall contain a description of the tunneling method and equipment proposed, tunnel support system, shop drawings, details and cross-sections, a schedule of operations, and the proposed work hours. Tunnel construction shall not commence until the CITY OF SHEPHERDSVILLE has reviewed the submittal and provided approval of the Plan. The CITY OF SHEPHERDSVILLE's approval shall in no way relieve the Contractor of his sole responsibility for the execution of

this Work or any liability. When tunnel construction shall be beneath a Railroad right-of-way, the Tunneling Plan shall also be subject to the approval of the Railroad.

7.3.4.2 Safety

All Work shall conform with applicable Subsections of the Kentucky Occupational Safety and Health Standards for the Construction Industry and 29 CFR, Part 1926, Subpart S, "Tunneling".

7.3.4.3 Working Hours

Work hours must be approved by the CITY OF SHEPHERDSVILLE as part of the construction schedule submittal. Tunnel construction operations may progress for 24 hours a day, except on Sundays. When Work is done at night, the Contractor shall provide adequate safety precautions such as watchmen, barricades, lights, etc., and any mechanical equipment used in the construction operations shall be of a type that produces a minimum amount of noise to avoid creating a nuisance.

7.3.4.4 Tunnel Shafts.

Shafts shall be constructed at the locations shown on the Plans. If not shown on the Plans, shafts shall be constructed at locations selected by the Contractor, subject to approval by the CITY OF SHEPHERDSVILLE. Temporary construction shafts shall be of adequate size and properly constructed and equipped to meet all requirements of safety to personnel and to the Work. All shafts shall be barricaded, lighted, fenced, and properly guarded from the beginning of the excavation until the completion of the construction requiring the shaft. A substantially constructed ladder shall be provided in each shaft and shall be kept in safe, good repair, clean, and clear of debris.

Provisions shall be made at each shaft so that plumb lines suspended on the centerline of the sewer at each end of the shaft will hang freely from the surface.

7.3.4.5 Tunnel Construction.

The Contractor shall carry out the Work of tunneling and supporting the tunnel face, roof, walls, and floor so that there will be no fall, flow, caving, or heaving of earth or other materials into the tunnel excavation. If there should be any fall or movement of earth into the tunnel at any time, the Contractor shall proceed with the Work with all necessary precautions and in such a manner as will ensure the safety of life and of all sewers, utilities and public and private property above and adjacent to the tunnel.

The Contractor shall furnish, place and maintain all sheeting, bracing or lining required to support the tunnel floor, roof, sides, and face until the pipe and its bedding, jointing, encasement and backfilling have been completed.

All liners shall remain in place. Care shall be used in trimming the surfaces of the excavated section and in placing the liners or sheeting and bracing so that the required minimum clearance between the outside of the pipe and the final position of the liners, sheeting and bracing in the tunnel will be attained without any deviation in sewer alignment. Sheeting or lining must be placed and held tightly against the trimmed earth surface of the excavated section so that complete filling of voids may be achieved between the earth and the lining or sheeting placed against it. No part of the lining, bracing, or flanges of steel liner plates shall project closer to the outside top of the pipe than 12 inches, or to the outside bottom of the pipe than 4 inches, unless shown otherwise on the Plans.

7.3.4.6 Prevention of Loss of Earth Materials

Cavities or spaces between the actual surfaces of excavation and the tunnel liner plates or sheeting, shall be completely filled with cement grout. Grout shall be placed under pressure through grout nipples in the steel liner plates or grout holes in sheeting. The grout holes shall be at minimum 10 feet centers and the grout placed in such sequence as to ensure the complete filling of all cavities and spaces and of carrying loads uniformly from the undisturbed material to the tunnel lining or sheeting. Grouting shall be done at frequent intervals simultaneously with the tunnel construction and immediately whenever a loss of material occurs. In no case should the tunnel be left ungrouted if Work is to be stopped or suspended for any extended period of time.

At the end of each working day, or whenever a delay in the tunneling is anticipated, the Contractor shall construct a bulkhead to prevent the caving of soil at the working face. The bulkhead shall be required unless the CITY OF SHEPHERDSVILLE specifically grants permission to omit the bulkhead.

Wherever unstable conditions are encountered and the Contractor is unable to proceed without loosening earth or creating voids outside the tunnel lining, the Contractor shall presolidify the soil around the area to be excavated by freezing the soil or injecting an approved chemical that will permit the tunnel excavation to proceed without any loss of earth material, or other method approved by the CITY OF SHEPHERDSVILLE. Before any stabilization of earth materials is begun, the Contractor shall obtain approvals. Stabilization shall be performed at no additional cost to the CITY OF SHEPHERDSVILLE.

7.3.4.7. Installation of Carrier Pipe

All pipe used in tunnels shall be of the type shown on the Plans or in the Contract and shall be of the size and strength class required.

After the tunnel section is excavated, lined, and braced, the carrier pipe shall be placed on and supported by steel rails, a concrete pad, or other approved supports. The supporting system shall assure line and grade and shall allow sufficient space below the pipe for placing concrete. Care shall be used to

avoid damage to the pipe or to the liner plates. The carrier pipe shall be rigidly braced to prevent its displacement when the annular space is backfilled.

The space between the carrier pipe and sides of the roof of the tunnel shall be completely filled with grout or with pea gravel or No. 9 crushed stone by pneumatic backstowing. The grout or granular material shall be uniformly placed and compacted to fill all spaces between the outside of the pipe and inside surface of the sheeting or lining. If filling with grout is selected, a 6-inch diameter Schedule 40 or SDR35 PVC pipe shall be placed and secured in the tunnel next to the carrier pipe to allow continued flow of any groundwater in the adjacent sewer trench. The drain pipe shall extend beyond the grout and at least 2 feet into the crushed stone encasement on both ends of the tunnel.

Temporary shafts shall be completely abandoned. Unless otherwise specified in the Plans or Contract, all sheeting, bracing, and similar items may be removed unless the Contractor requests and receives authorization from the CITY OF SHEPHERDSVILLE to leave it in place. No payment will be made for such items left in place at the Contractor's option.

7.3.5 Boring and Jacking.

7.3.5.1 Submittals and Approvals

Boring and jacking support systems shall be with steel casing pipe or other systems approved by the CITY OF SHEPHERDSVILLE. The Contractor shall furnish a detailed Boring and Jacking Plan for review by the CITY OF SHEPHERDSVILLE. The Plans shall contain a description of the Boring and Jacking method and equipment proposed, boring and jacking support system, shop drawings, details and cross-sections blocking system, a schedule of operations, and the proposed Work hours. Boring and Jacking construction shall not commence until the CITY OF SHEPHERDSVILLE has reviewed and approved the submittal. The CITY OF SHEPHERDSVILLE's approval shall in no way relieve the Contractor of his sole responsibility for the execution of this Work or any liability. When boring and jacking construction shall be beneath a Railroad right-of-way, the Boring and Jacking Plan shall also be subject to the approval of the Railroad.

7.3.5.2 Boring and Jacking Equipment and Construction

When required by the Plans, sewers shall be constructed within steel casing pipe which have been jacked or pushed into bored holes. The holes shall be bored from the low or downstream end, unless site conditions dictate otherwise and the CITY OF SHEPHERDSVILLE provides approval.

The access pit shall be of sufficient size to provide ample working space for the boring and jacking equipment, guide rails, reaction blocks, bracing, spoil removal, and sections of pipe as required. Provisions shall be made for the erection of guide rails in the bottom of the pit by providing a crushed stone

base where applicable. The Contractor shall be responsible for providing stable foundation and wall supports during boring operations.

The boring and jacking machine to be used shall be in good mechanical condition and capable of advancing the bore hole within the required limits of accuracy. The Contractor shall push the casing pipe as the bore progresses. All cutting heads shall be removable without retracting the casing pipe. Backstops and guide rails shall be of sufficient strength and rigidity to support the thrust of the boring and jacking machine without displacement. Guide rails shall be accurately laid to line and grade and maintained in this position until completion of the boring and jacking operation. A smooth casing pipe of sufficient strength and diameter shall be forced into the bored hole to provide a tight fit against the earth sides of the bore hole. The casing pipe shall be of minimum diameters as specified in Section 7.2.3. of these specifications. Joints between sections of the casing pipe shall be welded with a continuous circumferential weld. Following installation, the casing pipe shall be carefully inspected to ensure that the carrier pipe can be properly placed.

During placement of the carrier pipe in the casing, the carrier pipe shall be blocked or otherwise supported to secure the proper flow line elevations throughout its full length and to ensure that backfilling at the bottom, sides and top of the pipe can be done without any displacement or floating. The carrier pipe shall be placed in the casing pipe only by such method that will keep the pipe joints in compression. Any method tending to unjoint the pipe while being placed will not be permitted. When the casing pipe is 30" or larger, the spaces between the casing and the outside of the casing pipe shall be filled solidly with cement grout placed under pressure, after the entire casing pipe is in place. Grout meeting the requirements of Section 7.2.4. shall be pumped at a pressure between 10 and 15 PSI (23.0 to 35.0 feet of head). Provisions shall be made for the removal of all air and complete filling of the voids with grout mixture. Before placing grout inside the casing pipe, the exterior of the casing pipe shall be grouted on 10 feet centers and the carrier pipe shall be carefully inspected for uniformity of grade along its alignment and any required corrections shall be made. Particular attention shall be given to ensuring that the pipe will be solidly supported by the selected backfill at its bottom and sides. The method of injection of grout under mechanical pressure shall be approved by the CITY OF SHEPHERDSVILLE. Grout shall be placed by filling the casing pipe, through 4 inch diameter holes placed on 10 feet centers, beginning at the downstream end and proceeding upstream.

The space between the carrier pipe and sides of the casing pipe shall be completely filled with grout or with granular material by pneumatic backstowing, in accordance with the methods described in Section 7.3.4.7. If filling with grout is selected, a 6-inch diameter drain pipe shall be placed and secured next to the carrier pipe to provide through drainage of any

groundwater. This drain pipe shall be installed as described in Section 7.3.4.7.

Boring and jacking will be allowed for force main pipe, sanitary sewer, property service connections, and storm drains. In each of these instances, four linear feet of green marking tape, as specified in Section 4.2.7. of these specifications, shall be placed at the edge of pavement on each side.

When unforeseen obstructions or conditions require abandonment of a partially completed bore hole, plug end of pipe by filling with grout. Then the Contractor shall backfill the abandoned bore hole and start a new hole. The Contractor shall receive no compensation for any expenses incurred by any unsuccessful attempt.

SECTION 8

CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS

ROADWAY CONSTRUCTION AND REHABILITATION

8.1 DESCRIPTION OF WORK

8.1.1 General

This Work shall consist of milling and paving operations necessary to restore all existing pavements which were damaged or removed by the Contractor's operations and construction and paving operations necessary to provide new bituminous concrete pavement. Existing pavements shall be restored to conditions at least equal to their conditions before construction. Complete resurfacing or road construction shall be performed when required in the Special Provisions. The Contractor shall notify the City of Shepherdsville 48 hours prior to placement of binder, base or surface so areas that are to be paved can be approved by the City of Shepherdsville.

8.1.1.1 City, County, and State Paved Surfaces

Streets, alleys, sidewalks, curbs, and gutters originally constructed by ordinance or maintained by the City of Shepherdsville, and highways, roads and walks constructed and/or maintained by the Kentucky Transportation Cabinet (KTC) or the Bullitt County Department of Public Works and Transportation, which are wholly or partially removed, damaged or disturbed by the Contractor's operations, shall be promptly restored to the appropriate Agency's standards or as detailed in the Special Provisions.

8.1.1.2 Other Roadway Surfaces

Other roadway surfaces not constructed or maintained by the City of Shepherdsville, the Kentucky Transportation Cabinet or the Bullitt County Department of Public Works and Transportation, which are wholly or partially removed, damaged, or disturbed by the Contractor's operations, shall be restored with like or better materials to a condition as good as or better than existed prior to the beginning of the Work, so that movement of traffic, both vehicular and pedestrian, through the restored way shall be as free, safe, and unimpeded as before.

8.1.2 Maintenance or Indemnity Bond

The Contractor shall provide a Maintenance or Indemnity Bond to cover the cost of all claims, loss or damage and expenses of reconstruction or additional Work occurring because of settlement of backfill in the trenches under paved surfaces.

This bond will only apply to cuts in existing City of Shepherdsville roadways and the bond amount will be established by the City of Shepherdsville’s Engineer.

8.1.3 CITY OF SHEPHERDSVILLE Road Construction Standards

All new bituminous concrete pavements on City of Shepherdsville owned or maintained facilities and private roadways shall be constructed in accordance with the provisions in these Specifications. Included are the construction activities associated with the preparation of the subgrade, the placement and compaction of the aggregate base material, and the placement and compaction of bituminous concrete pavement materials. Also included are the submittals required prior to the placement of the pavement materials, and the test and inspection procedures required for acceptance of the finished product.

8.2 MATERIALS

8.2.1 Bituminous Concrete Binder and Surface

These materials shall meet the requirements for Class I mixtures as set forth in Sections 403.02 and 403.03.03 of the 1998 KTC Standard Specifications, and as summarized in the following table.

LABORATORY MIX DESIGN CRITERIA (50 BLOW MARSHALL METHOD)
CLASS I MIXTURES

<u>Property</u>	<u>Requirements</u>	
	<u>Binder</u>	<u>Surface</u>
Minimum Stability (pounds)	1,500	1,500
Flow (inches)	0.08 to 0.16	0.08 to 0.16
Air Voids (%)	3.0 to 5.5	3.5 to 6.0
Minimum VMA (%)	12.5	14.5

Prior to construction of the bituminous concrete binder, the Contractor shall submit a job-mix formula for both the bituminous concrete binder and surface courses. As a minimum the job-mix formula shall include the grain-size distribution of the aggregate, the asphalt cement content, the stability, flow and percent air voids as determined by KM 64-411, the percent VMA as determined by KM 64-429, and the percent retained tensile strength as determined by KM 64-628. Additionally, the Contractor shall supply the raw test data used to design the job-mix formula. These test data shall include, as a minimum, graphs of unit weight, stability, flow, air voids, and VMA.

A Job Mix Formula previously approved by the CITY OF SHEPHERDSVILLE will generally be accepted, but must still be submitted for each Project.

8.2.2 Bituminous Tack Coat

This material shall meet the requirements for SS-1h emulsified asphalt as set forth in Section 806.07 of the 1998 KTC Standard Specifications.

8.2.3 Portland Cement Concrete

This material shall meet the requirements for Class A concrete as set forth in Section 6 of these Specifications.

8.2.4 Aggregate Base

This material shall meet the requirements for dense graded aggregate (DGA) as set forth in Section 805.15 of the 1998 KTC Standard Specifications. If not from a previously approved source, prior to construction of the aggregate base, the Contractor shall submit a grain-size distribution for the aggregate base material. The grain-size distribution shall be developed in accordance with KM 64-620. The oven-dry bulk specific gravity, determined in accordance with KM 64-607, shall be submitted with the grain-size distribution. Testing of the aggregate base shall be performed by an Independent Testing Laboratory or by a Certified Aggregate Technician employed by the supplier.

8.2.5 Fill Materials

These materials shall be used in the construction of fill to the specified lines, grades, and cross-sections. The fill shall consist of selected excavated material meeting the requirements of Section 3.3.2.2. or borrow material meeting the requirements of Section 3.2.3. of the current City of Shepherdsville Standard Specifications.

8.3 EXECUTION OF WORK

8.3.1 Pavement Cut Back

Existing pavements shall be saw cut along straight lines running parallel to and on each side of the trench. They shall be cut such that the new pavement surface will be constructed in uniform widths at least 50 feet in length measured along the trench. Pavement material shall be removed and disposed of. An additional saw cut shall be made 12 inches back on each side of the trench, after trenching Work is complete, extending down to the base material or subgrade soil. The exposed base material, if present, or subgrade soil shall be refilled and compacted with manual tampers or rollers to a density equal to 95 percent of standard Proctor density, as determined by ASTM D 698.

For Portland cement concrete pavements, if saw cuts are within 4 feet of a formed joint in the existing pavement, then the existing slab shall be broken and removed to the joint.

8.3.2 Roadway Excavation Protective Covering (Steel Plates)

The objective is to provide optimal drive ability on all streets throughout the year. Avoiding damage to snow removal equipment from objects in the street is a seasonal issue. While the County and the City of Shepherdsville recognize and encourage

placing plates over roadway excavation sites to enable traffic to pass over the site when Work is not proceeding, the desire is also that the plates be minimally disruptive and meet all safety standards.

Requirements for Collector, Arterial Streets, and County through Roads:

November 1 to March 31: Recessed plates at all sites where Project lasts longer than two working days. No flat plates allowed.

April 1 to October 31: Recessed plates or beveled plates pinned to road surface.

Requirements for Residential Streets:

November 15 to March 31: Recessed or pinned beveled plates where Project lasts longer than two working days. No flat plates allowed.

April 1 to November 14: Recessed or beveled plates allowed where construction lasts five days or longer.

8.3.3 Manhole Adjustments

From November 1 to March 31 of the following year, manhole lids shall be adjusted in conjunction with placement of bituminous concrete pavement courses in order to avoid damage to snow removal equipment. Work related to maintaining manhole lids flush with the roadway surface shall be incidental to surfacing.

8.3.4 Pavement Milling

After milling and texturing, the finished surface shall provide a smooth riding surface free from gouges, ridges, oil film, and other imperfections of workmanship, having a uniform texture, and true to the required grade and cross section. The elevation of the longitudinal edges of adjacent cuts shall not differ more than 1/8-inch. When practicable, vertical longitudinal faces shall not be left during non-working hours to expose public traffic. When it is necessary to expose public traffic to longitudinal faces, the faces shall be no more than 1-1/4 inches in height and shall be tapered in a manner approved by the City of Shepherdsville, to avoid creating a hazard for traffic.

Where sound pavement has been gouged, torn, or otherwise damaged during the milling operations, or damage is done to any property of any kind including utility frames, grates, and covers, repairs shall be made by the Contractor at no cost to the City of Shepherdsville.

Lateral limits extend from the inside edge of the integral curb and gutter section a distance of at least 6-feet 6-inches into the existing pavement area. Remove existing pavement material that extends into the gutter portion of the integral curb and gutter section.

8.3.5 Pavement Restoration For Utility Cuts - Milled Streets

The compacted bituminous concrete binder course shall be 4-inches for subdivision streets and 6-inches (2-3 inch thick layers) on County through roads for utility cuts, including cuts for property service connections.

8.3.6 Bituminous Concrete Paving

8.3.6.1 General

Bituminous concrete paving shall be in accordance with Sections 403.01 through 403.03 of the 1998 KTC Standard Specifications.

8.3.6.2 Temperature and Weather Limitations

No paving shall take place between November 15 and April 1 without written permission from the City of Shepherdsville. Bituminous paving shall not be placed on any wet surface or when the ambient air temperature is less than that specified in the following table.

TEMPERATURE LIMITATIONS

<u>Bituminous Mixtures</u>	<u>Minimum Ambient Air Temperature for Placing (Degrees Fahrenheit)</u>
Bituminous Concrete Surface, 1" thick or less	45
Bituminous Concrete Surface, thicker than 1"	40
Bituminous Concrete Binder	35
Leveling and Wedging	45

The bituminous mixture shall be maintained at the following temperatures.

MIXING AND LAYING TEMPERATURES
(Degrees Fahrenheit)

Aggregates	Min 240 - Max 325
Asphalt Cement	Min 225 - Max 325
Mixture at Plant (measured in truck)	Min 240 - Max 325
Mixture When Placed (measured in truck when discharging)	Min 225

8.3.6.3 Dense Graded Aggregate Base Course

Where required in the Project Special Provisions or Plans, dense graded aggregate (DGA), having been thoroughly mixed with water in a twin shaft pugmill-type mixer shall be delivered to the site. The amount of water added shall be an amount which will provide the mixture with satisfactory moisture

content for compaction to the specified in-place density. The plant-mixed material shall be transported in such manner as to deliver the mix to the Project without loss of moisture or segregation. Only the aggregate base material which can be properly placed and compacted shall be transported to the site. DGA should not be stored or stockpiled on the job site without written permission from the City of Shepherdsville. During placement, the base material shall be wetted as directed to maintain the moisture content at the level necessary to ensure proper compaction. Unless otherwise permitted, the compacted depth of each layer shall be no less than 3 inches or more than 6 inches. Each layer shall be compacted to a density of no less than 84 percent of solid volume density throughout the layer. The density determination shall be based on the oven-dry bulk specific gravity as determined by KM 64-607. Manually operated tampers or walk-behind rollers will be required in trenches and other restricted areas inaccessible to paving rollers.

DGA base material in trench areas will be placed as soon as practicable. Trench backfill which was flushed and jetted will have drained and completed its settlement before base material is placed. If paving operations are not to begin immediately, the aggregate base shall be placed even with the existing pavement surface, and the roadway shall be opened to traffic. Any damage which occurs to the exposed base, such as raveling or the formation of potholes, shall be repaired immediately by the Contractor. All edges of the repaired areas shall be sealed.

Immediately prior to paving, the Contractor shall remove aggregate base material from trench areas. The thickness of the material to be removed shall equal the thickness of the bituminous concrete required in the trench area, as stated in the Special Provisions. Aggregate base remaining in the trench, but loosened by this operation, shall be wetted and recompact, as directed by the City of Shepherdsville.

Construction scheduling operations shall be coordinated so that the aggregate base is completely covered with the specified pavement courses before Work is suspended for the winter months, or for any other long delays.

8.3.6.4 Portland Cement Concrete Base

When required on the Plans or in supplemental specifications, Class A concrete, shall be used as base material in trench and cut back areas. The thickness of the concrete base shall be as shown on the Plans or in the supplemental specifications. All concrete Work shall conform to Section 6 of these Specifications. Prior to placing bituminous surface over the concrete base, the concrete shall be thoroughly cleaned, and shall be sprayed with tack coat material as specified in Subsection 8.3.6.6. of these Specifications.

8.3.6.5 Cleaning Existing Pavements

The Contractor shall clean all pavement areas which are to receive tack coat and bituminous surface course. Cleaning shall be with water jets, mechanical sweepers, and hand brooms, as necessary to completely remove all foreign materials from surfaces which are to be paved.

8.3.6.6 Tack Coat

Tack coat shall be applied to the cleaned pavement, prior to the application of wedging, leveling, or surface course. The tack coat material shall be applied uniformly at a rate of 0.40 gallons per square yard. The tack coat shall be allowed to cure to a dark black color before surface course material is applied.

"Fresh Oil" signs shall be placed where they are clearly visible during the period that tack coat material has been applied to a roadway. The signs shall not be removed until the tack coat has been paved over with the bituminous surface.

8.3.6.7 Leveling and Wedging

Leveling and wedging of uneven, irregular areas, including pre-existing conditions and paved shoulders, shall be performed when necessary, to provide a smooth, uniform base upon which the bituminous surface will be placed. The bituminous mixture for leveling and wedging shall be placed with a paving machine. After satisfactory spreading of the mixture has been completed, the mixture shall be thoroughly compacted by a paving roller. Tack coat material shall be applied to areas which have received wedge or leveling course. Cost shall be incidental to surfacing. Areas that are heaved or otherwise deformed due to Contractor's operations, shall be removed and restored to original contours in accordance with section 8.3.6.3.

8.3.6.8 Edge Keys

Edge keys will be required at the paving limits where new bituminous pavements join existing pavements. An edge key shall consist of a cut in the existing pavement 2 feet wide by 1 inch deep, and shall extend across the complete width of the roadway. The Contractor shall use care when making edge key cuts, to ensure that the specified depth is not exceeded by using a milling machine.

8.3.6.9 Driveways and Entrances

Edge keys will not be required at driveways and entrances. The bituminous surface course shall be tapered to allow a smooth transition from the edge of the pavement into the existing driveway. Feathering of the edge will be acceptable. The edge of new paving at driveways and entrances shall be straight and parallel to the curb or centerline of the roadway.

8.3.6.10 Adjustment of Shoulders

When the placement of bituminous surface results in an abrupt vertical transition at the edge of pavement, the Contractor shall place and compact additional material within a 1 to 2-foot distance from the edge of the pavement. For purposes of these Specifications, “abrupt vertical transition” shall mean a 2½-inch vertical drop over a horizontal distance of less than 6 inches. The material placed shall be of the same character as the existing shoulder material. It shall be graded so as to provide a smooth transition from the pavement surface to the original shoulder.

8.3.7 Temporary Paving

8.3.7.1 Temporary Surface

Temporary pavements shall be constructed over trenches as shown on the Plans in areas of heavy traffic or where safety is a concern as directed by the City of Shepherdsville. Temporary paving shall consist of a 6 inch thick compacted aggregate base and a 2 inch compacted bituminous Class I binder. The thicknesses specified are minimums and may be increased by the Contractor, if in his opinion, a thicker base or surface is warranted. The temporary paving shall be maintained by the Contractor and depressions and potholes which develop shall be promptly repaired. Prior to constructing the permanent paving, all temporary binder and base material shall be removed from the trenches and wasted away from the Project.

8.3.7.2 Temporary Roads

All temporary roads shall be constructed of the materials and to the dimensions shown in the Plans.

8.3.7.3 Temporary Trench Surface

Upon completing backfill Work in roadways the Contractor shall immediately place DGA over trench areas to provide a temporary travel surface, at no additional cost to the City of Shepherdsville.

8.3.7.4 Construction Entrances

Construction entrances shall be constructed as shown on the Plans as specified in the Standard Drawings.

8.3.8 Bituminous Road Construction

8.3.8.1 Clearing and Grubbing

This item of Work shall consist of clearing, grubbing, removing and disposing of all vegetation, structures and debris, which are located within the

designated limits of the proposed pavement. All Work shall be performed in accordance with Section 2 of the City of Shepherdsville Standard Specifications.

8.3.8.2 Preparation for Placement of Fill.

Prior to the placement of any fill material or the placement of any pavement materials, the surface of the cleared and grubbed area shall be thoroughly inspected by the City of Shepherdsville Inspector. The entire surface shall be "proof-rolled" using a loaded pan, a loaded tri-axle dump truck, a loaded single-axle dump truck or a heavy flat-drum roller. The City of Shepherdsville Inspector shall observe the behavior of the surface for signs of pumping, rutting or excessive settlement.

Areas which pump, rut, settle, or exhibit other undesirable behavior shall be undercut to firm material and backfilled, stabilized in place using KTC No. 2 crushed aggregate, or aerated and compacted in-place.

8.3.8.3 Placement of Fill Material

This item of Work shall include placing and compacting fill material to the specified lines, grades and cross-sections.

Only acceptable materials shall be used to construct the fill. Fill material shall not be placed on frozen areas, or areas containing snow or ice.

Where required on the Plans, benches with horizontal and vertical faces shall be excavated into the original ground.

The fill material shall be placed and compacted in uniform horizontal layers not exceeding twelve inches in thickness, loose measurement. Each layer shall be thoroughly compacted to a minimum of 95 percent of standard Proctor density at moisture content between plus two percent and minus four percent, as determined by ASTM D 698. Each layer shall be properly compacted before the next succeeding layer is placed.

8.3.8.4 Subgrade

Final grading shall be performed to construct the subgrade to the lines, grades, and cross-sections indicated on the plans. The surface of the subgrade shall be compacted to a uniform slope at a uniform density throughout. High areas shall be removed by scarifying and low areas shall be filled by placing and compacting suitable material.

When a sheepsfoot roller is used, the compaction shall be finished with a steel-wheel roller, a multiple-wheel pneumatic-tire roller, or other suitable equipment having sufficient weight to smooth out and compact the indentations made by the sheepsfoot roller.

Once final grading is complete, the embankment shall be maintained at the specified line, grade, and cross-section and at the specified density and moisture content. If the material subsequently loses its density or moisture content, it shall be recompact to the proper density at the required moisture content.

The subgrade shall show no deviation greater than one-half inch in 10 feet from the specified section and shall be constructed uniformly so that the base, binder, and surface courses can be constructed within their specified tolerances.

8.3.8.5 Aggregate Base

Dense graded aggregate base shall conform to the requirements of Section 8.3.6.3. of these Specifications. In addition, initial layers of aggregate base shall be maintained to a uniform grade and cross-section during compaction. The final layer shall be shaped to the specified line, grade and cross-section. When the final layer is to be trimmed to the final grade by an automatic grading machine, the final layer shall be constructed approximately one-half to one inch above grade, so that the grading machine cuts constantly. After the final pass of the grading machine, the surface shall be wetted and rolled. The surface of the finished aggregate base shall be smooth and uniform and shall not deviate by more than one-half inch from the specified cross-section. The longitudinal grade shall not deviate more than three-eighths of an inch within ten feet in any direction.

8.3.8.6 Bituminous Tack Coat

Tack coat material shall be applied to the cleaned surface of the underlying bituminous concrete course prior to the application of the surface course. The tack material shall be applied at a rate of 0.40 gallons per square yard.

The tack coat shall be allowed to cure to a dark black color before the surface course is applied.

Upon approval of the City of Shepherdsville, the application of the tack coat may be eliminated when the surface course is placed within 48 hours of the placement and compaction of underlying binder course, provided the binder is not disturbed during curing.

8.3.8.7 Bituminous Concrete

Bituminous concrete pavement shall be in accordance with Section 403.01 through 403.03 of the 1998 KTC Standard Specifications. The in-place density of the pavement shall be a minimum of 98% of the density as determined by the control strip method outlined in KM-432.

8.3.9 Portland Cement Concrete Paving

Portland cement concrete paving shall be performed in accordance with Sections 501.01 through 501.03 of the 1998 KTC Standard Specifications.

8.4 INSPECTION AND TESTING

8.4.1 General

The paving operations, including subgrade preparation, placement and compaction of the base, and the placement and compaction of the bituminous concrete pavement shall be performed in the presence of the City of Shepherdsville inspector. Field and laboratory testing shall be performed by an agency designated or approved by the City of Shepherdsville to provide pavement inspection and materials testing. Acceptable methods of performing field density tests are specified in Section 3.3.8.3. of the City of Shepherdsville Standard Specifications.

8.4.2 Field Inspection

In addition to routine visual inspection, periodic field measurements of the thickness of the granular base shall be performed by the inspector. Areas lacking in thickness shall be noted and reported to the Contractor.

During placement of the bituminous concrete pavement, field measurements of the temperature of the mix in the truck bed shall be performed to ensure compliance with the Project specifications. Measurements of the course thickness shall be performed by the inspector during placement. Discrepancies shall be noted and reported to the Contractor.

8.4.3 Field Density Testing

8.4.3.1 Embankment

As a minimum, one field density test shall be performed on the compacted fill for each 500 cubic yards of material placed, with a minimum of one test performed each lift and one test performed each shift (day). Additional density tests shall be performed when directed by the City of Shepherdsville, or when there is a suspicion of a change in material, moisture content, or degree of compaction control.

8.4.3.2 Granular Base

As a minimum, field density tests shall be performed on the granular base at the rate of one test per 2,000 square feet, with a minimum of one test per shift during which granular base is placed.

8.4.3.3 Bituminous Pavement

As a minimum, one field density test shall be performed on the bituminous pavement for every 200 linear feet of material placed, with a minimum of one test per shift during which bituminous pavement is placed.

8.4.4 Laboratory Testing

8.4.4.1 General

Laboratory tests shall be performed on the materials used for construction of the granular base and the bituminous concrete pavement. Testing shall be performed by an agency designated or approved by the City of Shepherdsville to provide materials testing.

8.4.4.2 Granular Base

Sampling and laboratory testing of the granular base material shall be performed when difficulties are experienced by the Contractor, in obtaining the specified density, or when the inspector suspects that the material used for the granular base does not meet the Project specifications.

As a minimum laboratory testing shall consist of the performance of a moisture content test (ASTM D 2216), a specific gravity test (KM 64-607) and a wet sieve analysis (KM 64-620).

8.4.4.3 Bituminous Concrete Pavement

Sampling and laboratory testing of the bituminous concrete pavement material shall be performed on a regular basis on the City of Shepherdsville Projects. Samples of the bituminous concrete materials shall be tested, both in the morning and in the afternoon on Projects involving the full-time placement of pavement. On smaller Projects, a minimum of one sample shall be obtained per Project.

When requested, the Contractor shall submit to the CITY OF SHEPHERDSVILLE a sample of the asphalt cement being used in the batching of the bituminous paving mix. Samples shall be obtained, identified and delivered to the inspector in accordance with KM 64-404.

Laboratory testing shall consist of the performance of an extraction test (KM 64-405) and a sieve analysis (KM 64-406).

8.5 DRIVEWAYS

8.5.1 Concrete Driveways

Driveways to be reconstructed shall be restored with 6 inches of Class "A" concrete, 4 inches DGA and formed and shaped as designated on the Plans. The concrete shall be reinforced with polypropylene fiber at 2 pounds per C.Y. as specified in Section

6.2.2.3. Contraction joints shall be constructed as required by the City of Shepherdsville. Non-extruding, preformed expansion joint material, 1/2 inch thick, shall be used at back of curb and against any abutting concrete, unless otherwise directed by the City of Shepherdsville.

8.5.2 Asphalt Driveways

Driveways to be reconstructed shall be restored with 4 inches of compacted DGA as a base and 2 inches bituminous concrete surface Class I, shaped as designated on the Plans.

8.5.3 Stone Driveways

Driveways to be constructed shall be restored with 4 inches of crushed stone to match existing stone driveway, shaped as designated on the Plans.

8.6 CLASSIFICATION OF STREETS

Arterial Streets.

Streets designed or utilized primarily for high vehicular speeds or for heavy volumes of traffic.

Collector Streets.

Streets which carry or will carry intermediate volumes of traffic from local streets to arterial streets.

Minor-Local Streets.

Streets used primarily for access to abutting properties and which carry or will carry limited volumes of traffic.

Marginal Access Streets.

Streets parallel to and adjacent to arterial streets and which serve to reduce the number of access points to the arterial streets.

Cul-de-sacs.

A minor street which has only one outlet to other streets; a street which dead-ends.

Alleys.

Streets used primarily for vehicular service access to the backs or to the side of properties which otherwise abut on streets.

8.7 MINIMUM PAVEMENT STANDARDS

Alley	Collectors	Commercial
<u>Cul-de-sac</u>	Marginal Access Streets	<u>Industrial</u>
4" #3 Stone	<u>Minor Local Streets</u>	6" #3 Stone
4" DGA	4" # 3 Stone	4" DGA
	4" DGA	

2" Binder
1" Surface

2" Binder
1" Surface

4" Binder
1.5" Surface

Due to soil conditions, the amount of #3 stone may be omitted if shot rock or slate is used as the base, upon approval from the City Engineer. Upon recommendation from a geotechnical engineer, the minimum pavement standards listed above may be waived upon approval from the City's Engineer.

8.8 LOT NUMBERS

The subdivision developer shall be responsible for painting lot numbers on the concrete curb directly in front of the property corners for each lot in the subdivision. The lot numbers shall be stenciled using black paint and be a minimum of 2" in height. Lot numbers shall be painted immediately after the property corners have been set.

8.9 MINIMUM WIDTH OF RIGHT-OF-WAY

Arterial	60 feet
Collector	50 feet
Minor	50 feet
Marginal Access	50 feet
Cul-de-Sac	100 feet

8.10 MINIMUM WIDTH OF PAVEMENT

Arterial	32 feet
Collector	20 feet with 2' curb and gutter
Minor	20 feet with 2' curb and gutter
Marginal Access	20 feet with 4' shoulder
Cul-de-Sac	70 feet with 2' curb and gutter
Private Roadway	18 feet

8.11 MINIMUM GRADE FOR DRAINAGE

Minimum grade for all roadways shall be 0.5%.

8.12 MAXIMUM ALLOWABLE GRADE

Arterial	5%
Collector	7%
Minor	12%
Marginal Access	12%
Cul-de-Sac	12%

8.13 MINIMUM SITE DISTANCE

Arterial	300 feet
Collector	300 feet
Minor	100 feet
Marginal Access	80 feet
Cul-de-Sac	80 feet

8.14 MINIMUM RADIUS OF HORIZONTAL CURVES

Arterial	400 feet
Collector	100 feet except for street intersection corners
Minor	100 feet except for street intersection corners
Marginal Access	-
Cul-de-Sac	-

8.15 MINIMUM LENGTH OF VERTICAL CURVES

Arterial	200 feet but not less than 50 ft for each 1% difference of grade
Collector	100 feet but not less than 25 ft for crest curve and 35 ft for sag curve for each 1% difference in grade.
Minor	100 feet but not less than 25 ft for crest curve and 35 ft for sag curve for each 1% difference in grade
Marginal Access	80 feet
Cul-de-Sac	70 feet

8.16 MINIMUM LENGTH OF TANGENTS BETWEEN REVERSE CURVES

Arterial	300 feet
Collector	100 feet except when excessive grades may be reduced to reasonable grades by shortening tangent.
Minor	100 feet except when excessive grades may be reduced to reasonable grades by shortening tangent.
Marginal Access	50 feet
Cul-de-Sac	50 feet

8.17 STREET LIGHT REQUIREMENTS

The developer shall submit to the City Engineer for approval, the type and location of all street lights to be located within a subdivision prior to installation of the lights.

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SECTION 9

CITY OF SHEPHERDSVILLE STANDARD SPECIFICATIONS

CHANNEL AND SLOPE STABILIZATION, SITE RESTORATION AND CLEAN UP

9.1 DESCRIPTION OF WORK

9.1.1 Channel and Slope Stabilization

This work consists of the stabilization of channels, waterways and ditches using grass linings, erosion control blankets, turf reinforcement mats and “hard” linings such as Class II and Class III channel lining, rip rap, mattresses, gabions and concrete paved channels.

9.1.2 Site Restoration

This work shall consist of topsoil replacement, permanent soil stabilization, and sodding to restore or establish vegetative cover on the site.

9.1.3 Clean Up

This Work shall consist of daily and final clean-up of the project site.

9.2 MATERIALS

9.2.1 Agricultural Limestone

Agricultural limestone shall contain not less than 85 percent of calcium carbonate and magnesium carbonate combined and shall be crushed so that at least 85 percent will pass the No. 10 sieve and 100 percent will pass the 3/8 inch sieve.

9.2.2 Dolomitic Limestone

Natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 90 percent passes a No. 10 sieve and not less than 50 percent passes a No. 100 sieve.

9.2.3 Fertilizer

Manufactured fertilizer shall be a standard commercial fertilizer, Grade 10-10-10, or 20-10-10 as specified herein, containing the specified percentages by weight of nitrogen (N), phosphate (P₂O₅) and potash (K₂O). A minimum of 50% of the nitrogen (N) shall be slow release nitrogen or the fertilizer shall be a complete formula. The fertilizer shall be furnished in standard containers with the name,

weight, and guaranteed analysis clearly marked. The containers will ensure proper protection in handling and transporting the fertilizer. All commercial fertilizer shall comply with the Kentucky Fertilizer Law.

9.2.4 Permanent Seed

The seed shall meet the requirements set forth in Section 827.04 of the 1998 KTC Standard Specifications. If requested, the Contractor shall furnish a certified laboratory report from an accredited commercial seed laboratory showing the analysis of the seed furnished and approving the seed purity and germination. The report shall be signed by a Senior Member of the Society of Commercial Seed Technologists. The seed mixture to be used for permanent seeding shall be as follows and shall be the Turf Quality Tall Fescue mixture unless the Contract stipulates otherwise.

All seeding rates specified in these specifications and in the Contract shall be in terms of the rate of pure live seed to be seeded. The actual seeding rate shall be calculated using the following formula:

$$ASR = \frac{10,000 (PLSR)}{(\%GERM) (PURITY)}$$

where: ASR = Actual Seeding Rate (lbs/1000 sf)
PLSR = Pure Live Seed Seeding Rate (lbs/1000sf)
% GERM = Percent Germination
PURITY = Pure Seed Content (Percent)

Permanent Seed Mixtures

- (A) Turf Quality Tall Fescue - Use blend of three or four of the top ten performing varieties listed in the most current edition of the Kentucky Turfgrass Research (published by the University of Kentucky College of Agriculture), mixed in equal proportions. Seed at a pure live seed rate of 8 lbs./1000 sq. feet.
- (B) Kentucky Bluegrass - Use mixture of 85 percent Bluegrass with 15 percent Perennial Ryegrass. The Bluegrass blend should consist of two or three of the top ten performing varieties listed in the most current edition of the Kentucky Turfgrass Research (published by the University of Kentucky College of Agriculture), mixed in equal proportions. Seed at a pure live seed rate of 2 lbs./1000 sq. feet.
- (C) Kentucky 31 Tall Fescue - For use in channels subjected to sustained, high velocity flows and in general rough turf areas. Use mixture of 70 percent of Kentucky 31 Fescue, 15 percent Creeping Red Fescue, 10 percent Redtop,

and 5 percent Dutch Clover. Seed at a pure live seed rate of 3 lbs./1000 sq. feet.

- (D) Native Grass - For use in riparian and/or wildlife sensitive areas. Use mixture of grasses and forbs as specified below.

The following seed mixture shall be applied at the pure live seed rate of 0.23 lb/1000 sq. feet. (10 lb/acre).

Grasses

Hystrix patula - Bottle brush grass	0.10 lb/1000 sq. ft. (4.5 lb/acre)
Andropogon virginicus - Broomsedge	0.05 lb/1000 sq. ft. (2.25 lb/acre)
Chasmanthinum latifolium - River Oats	0.05 lb/1000 sq.ft. (2.25 lb/acre)

Forbs

Oenothera bienis - Evening primrose	0.01 lb/1000 sq.ft. (0.5 lb/acre)
Eupatorium regofum - Black snake root	0.006 lb/1000 sq.ft. (0.2 lb/acre)
Solidago altissima OR Solidago canadensis (Goldenrod)	0.006 lb/1000 sq.ft.(0.25 lb/acre)

9.2.5 Straw Mulch

Straw for mulching shall be baled wheat, oat, barley or rye straw. It shall be reasonably free from weed seeds, foreign matter, or chaff and shall not contain any Johnson Grass, Canada Thistle, or Nodding Thistle. Straw for mulching shall be reasonably bright in color and shall not be musty, moldy, or otherwise of low quality, and shall not contain any chemicals toxic to plant growth.

9.2.6 Wood Cellulose Fiber Mulch

Wood cellulose fiber may be used in place of straw material or as a mulch anchor. Wood cellulose fiber mulch shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state. Wood cellulose fiber mulch shall not contain any germination or growth inhibiting elements. Wood cellulose fiber mulch shall be dyed green or contain a green dye in the tackifier that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry. Wood cellulose fiber mulch shall conform to the following parameters: fiber length to approximately 10mm diameter approximately 1 mm., pH range 4.0 to 8.5, maximum ash content of 1.6% and minimum water holding capacity of 90%.

9.2.7 Mulch Anchoring

9.2.7.1 Jute Netting

Undyed jute yarn woven into a uniform, open, plain weave mesh with approximately one inch openings, weighing not less than 90 pounds per 100 square yards, or in rolls.

9.2.7.2 Photodegradable Plastic Netting

Photodegradable plastic netting for holding down mulch shall consist of extruded, oriented, photodegradable plastic net (colored green) having a minimum width of 45 inches, 5/8 inch to 3/4 inch mesh openings and weighing approximately 3 pounds per 1,000 square feet. Photodegradable plastic netting shall not be used in natural and/or riparian areas.

9.2.7.3 Staples

Staples shall be V-shaped and made from No. 11 gage steel wire, or another approved material, having an effective driving depth of at least 8 inches or a 1 or 2 inch crown. Means other than steel staples shall be used in residential areas.

9.2.7.4 Tackifier

Synthetic/chemical binders, emulsions and slurries used to and or mulch. These products shall be non-toxic and biodegradable. No asphalt emulsions shall be allowed.

9.2.8 Sod

Sod shall be well-rooted Turf Quality Tall Fescue or Kentucky Bluegrass as directed by the City of Shepherdsville or as stipulated by the Contract. The sod shall be completely free from noxious weeds, and reasonably free from other objectionable grasses and weeds and stones or other foreign materials detrimental to the development and future maintenance of the sod. The source of sod shall be covered with grass having a height of no more than 3 inches and shall be available for inspection and approval prior to cutting.

9.2.9 Erosion Control Blankets

Erosion control blankets (straw, coconut fiber, wood fiber, etc.) shall meet the requirements set forth below, shall not be damaged or torn, and shall meet the manufacturer's specifications.

9.2.9.1 Wood (Excelsior) Blankets

Wood blankets shall consist of a machine produced mat of curled wood fibers, 80 percent of which shall be 6 inches or longer in length with consistent thickness and fibers evenly distributed over the entire area.

Blankets designated on the Plans as "High Velocity" shall be covered on both sides with heavy duty plastic netting having a mesh opening of approximately 3/4 inch by 3/4 inch. Other blankets shall be covered on one side with the plastic netting. The blanket shall be supplied in rolls 48 inches wide and shall weigh approximately 1.6 lbs./square yard.

9.2.9.2 Straw Blankets

Straw blankets shall consist of a machine-produced mat of 100% agricultural straw evenly distributed over the entire area of the mat. The top side of the blankets designated for use on mild slopes (3:1 or flatter) and low-flow swales shall be covered with polypropylene netting having an approximate 1/2 inch x 1/2 inch mesh size. The blanket shall be sewn together with cotton thread. Other blankets shall be covered on both sides with the polypropylene netting. The blanket shall be sewn together with cotton thread. It shall be supplied in rolls weighing approximately 0.5 lbs/square yard. When required, accelerated photodegradable netting shall be provided to assure blanket deterioration in 30 to 45 days.

9.2.9.3 Straw/Coconut Fiber Blankets

The blanket shall consist of a machine produced mat of 70% agricultural straw and 30% coconut fiber evenly distributed over the entire area of the mat. The top side of the blanket shall be covered with UV stabilized polypropylene netting having an approximate 5/8 inch x 5/8 inch mesh, and the bottom side shall have a polypropylene netting with an approximate 1/2 inch x 1/2 inch mesh size. The blanket shall be sewn together with cotton thread. It shall be supplied in rolls weighing approximately 0.5 lbs/square yard.

9.2.9.4 Coconut Fiber Blankets

Coconut fiber channel lining shall consist of a machine-produced mat of 100% coconut fiber evenly distributed over the entire area of the mat. The blanket shall be covered on top and bottom with UV stabilized polypropylene netting having an approximate 5/8 inch x 5/8 inch mesh size. The blanket shall be sewn together with black polyester thread. It shall be supplied in rolls weighing approximately 0.5 lbs/square yard.

9.2.9.5 Recycled Nylon Fiber Blanket

The nylon fiber permanent channel liner shall consist of a machine-produced mat of 100% recycled nylon fiber evenly distributed over the entire area of the mat. The top side of the blanket shall be covered with UV stabilized polypropylene netting having an approximate 1/2 inch x 1/2 inch mesh size, and the bottom net shall be UV stabilized polypropylene with a 5/8 inch x 5/8

inch mesh size. The blanket shall be sewn together with black polyester thread. It shall be supplied in rolls weighing approximately 0.8 lbs/square yard.

9.2.9.6 Seed-Incorporated Blankets

The seed-incorporated blanket shall consist of 2-ply 100% recycled, unbleached, cellulose tissue. Unless specified otherwise in the Contract, a standard seed mix of 66% Ky 31 Tall Fescue and 33% Annual Ryegrass at a rate of .05 lbs/sq. yard shall be uniformly distributed upon the bottom ply of cellulose tissue and fully overlaid with a top cellulose ply to provide complete envelopment of the seed layer. The seed-filled cellulose medium shall be sewn to the bottom side of the specified erosion control blanket. The seed filled

9.2.9.7 Biodegradable Blankets

Biodegradable erosion control blankets shall be composed of straw, straw/coconut fiber, or coconut fiber mats meeting the specifications of those given in Subsections 9.2.9.2, 9.2.9.3, and 9.2.9.4 above. The blanket shall be covered on top and bottom with woven natural fiber netting having an approximate 1/2 inch x 1 inch mesh size. The blanket shall be sewn together with biodegradable thread. It shall be supplied in rolls weighing approximately 0.5 lbs/square yard.

9.2.10 Erosion Control Fabrics

Erosion fabrics (coir, jute, etc.) shall meet the requirements set forth below, shall not be damaged or torn, and shall meet the manufacturer's specifications.

9.2.10.1 Coir Fabrics

The coir erosion control fabric shall consist of 100% natural coir drawn from coconut husks. The yarn shall be wheel spun, well cleaned, evenly spun and uniformly twisted. The fabric shall have an open weave construction. The weight of the fabric, allowable water flow velocities, maximum shear stress and its durability shall equal or exceed the fabric(s) specified on the Plans or in the Contract.

9.2.10.2 Jute Fabrics

Jute erosion control fabrics shall be manufactured using woven jute that is undyed and unbleached. The fabric shall have an open weave construction. The weight of the fabric, allowable water flow velocity, maximum shear stress and its durability shall equal or exceed that of the jute fabric(s) specified on the Plans or in the Contract.

9.2.11 Turf Reinforcement Mats

Turf reinforcement mats shall be manufactured using synthetic materials, natural materials, or a combination of both. Turf reinforcement mats shall be those specified on the Plans or in the Contract. No substitutions are allowed unless directed by the City of Shepherdsville and approved by the City of Shepherdsville.

9.2.12 Anchors for Erosion Control Blankets, Erosion Control Fabrics, and Turf Reinforcement Mats

9.2.12.1 Staples

Staples for securing the erosion control blankets shall be U-shaped and made from No. 11 gage (minimum) steel wire or other approved material with an effective driving depth of at least 8 inches on disturbed soil and 6 inches on undisturbed soil. Staples shall have a 1-inch to 2-inch crown. Staples shall meet and be installed according to the blanket manufacturer's specifications. If any conflict exists between the manufacturers and the City of Shepherdsville's specifications, the more stringent requirements shall be met unless otherwise directed by the City of Shepherdsville. The Contractor shall supply a set of specifications for the City of Shepherdsville's use. Means other than steel staples or pins shall be used to anchor blankets, fabrics and mats in residential areas.

9.2.12.2 Pins

Pins may be steel, plastic or wood. They must meet or exceed the requirements or recommendations of the blanket, fabric or mat manufacturer. Means other than steel staples or pins shall be used to anchor blankets, fabrics and mats in residential areas.

9.2.12.3 Dead Stout Stakes

Dead stout stakes shall be constructed using 2-inch x 4-inch (nominal) hardwood lumber, 18 to 24 inches in length, cut diagonally across its length to form two stakes. The length of stakes shall be in accordance with the specifications of the manufacturer of the erosion control product.

9.2.12.4 Wood Stakes for Securing Sod

Wood stakes shall be 1-inch x 1-inch untreated pine with a minimum length of 6 inches.

9.2.13 Concrete

Concrete paved ditches and channels shall be constructed using Class A Concrete as defined in Section 6 of these Specifications.

9.2.14 Concrete Reinforcement

Deformed steel reinforcing bars, welded wire fabric, and polypropylene fibers shall be as defined in Section 6 of these Specifications.

9.2.15 Aggregate for Class II Channel Lining

Aggregate for Class II Channel Lining shall be limestone meeting the general requirements of Section 805 of the 1998 KTC Specifications. This material shall be produced by using a crusher, grizzly, or sieve with openings of 9 inches and by such additional processing as may be necessary so that no more than 20 percent of the finished product will pass through square openings 5 inches by 5 inches.

9.2.16 Aggregate for Class III Channel Lining and Rip-Rap

Material for Class III Channel Lining and Rip-Rap shall meet the general requirements of Section 805 of the 1998 KTC Specifications. No less than 80 percent, by volume, of individual stones shall range in size from 1/4 to 1-1/2 cubic feet. Stones of smaller sizes are permissible for use in filling voids in the upper surface and dressing to proper slope.

9.2.17 Aggregate for Mattresses

Aggregate for mattresses shall be hard, durable, clean limestone meeting the general requirements of Section 805 of the 1998 KTC Specifications. Stone size shall be from three (3) to six (6) inches for nine (9) inch deep units. For units of six (6) inch nominal depth, the stone size shall not exceed four (4) inches unless directed by the CITY OF SHEPHERDSVILLE.

9.2.18 Aggregate Fill for Gabions

Aggregate fill for gabions shall meet the general requirements of Section 805 of the 1998 KTC Specifications except that stones used shall be from four (4) to eight (8) inches in size for units over 12 inches deep. In units 12 inches deep, stone size shall be from four (4) to six (6) inches, unless otherwise directed by the CITY OF SHEPHERDSVILLE.

9.2.19 Mattress Units

Mattress units shall meet the requirements of Section 813.14 of the 1998 KTC Specifications, unless otherwise stated in these Specifications. The nominal diameter, after zinc coating, of the mesh wire and lacing wire shall be 0.0866 inches (U.S. Gage No. 13); and of selvage wire shall be 0.1063 inches (U.S. Gage No. 11).

All wire gages are subject to tolerances in accordance with ASTM A 640-1982 Table 3.

A City of Shepherdsville inspector may sample each shipment of mattresses for testing of the wire size and zinc coating. Any other tests deemed necessary by the City of Shepherdsville shall be performed at the Contractor's expense. Other tests may include load test, elongation test, or test of tensile strength in accordance with the following standards:

- (A) TENSILE STRENGTH of all wire used for manufacturing the gabions and lacing wire shall be in accordance with ASTM A 641, measured before fabrication of netting.
- (B) LOAD TEST shall be conducted in accordance with Federal Specifications (QQ-W-461 H Class 3).
- (C) ELONGATION TEST shall be conducted in accordance with Federal Specifications (QQ-W-461 H Class 3).

Acceptance will be based on laboratory results or visual inspection.

9.2.20 Gabion Baskets

Gabion baskets shall meet the requirements of Section 813.14 of the 1998 KTC Specifications. In addition, gabions shall be manufactured in such a manner that their sides, ends, lid and diaphragm(s) can be assembled to form rectangular units of the specified dimensions. The front, base, back and lid shall be woven into a single unit, with ends and diaphragm(s) factory connected to the base. The nominal diameter, after zinc coating, of the mesh wire shall be 0.1180 inches (U.S. Gage No. 11); of selvage wire shall be 0.1535 inches (U.S. Gage No. 9); and of lacing and connecting wire shall be 0.0866 inches (U.S. Gage No. 13).

All wire gages are subject to tolerances in accordance with ASTM 641A-71A (1980) Table 3.

A City of Shepherdsville inspector may sample each shipment of gabion baskets for testing of the wire size and zinc coating. Any other tests deemed necessary by the City of Shepherdsville shall be performed at the Contractor's expense. Other tests may include load test, elongation test, or test of tensile strength in accordance with the following standards:

- (A) TENSILE STRENGTH of all wire used for manufacturing the gabions and lacing wire shall be in accordance with ASTM A 641, measured before fabrication of netting.

- (B) LOAD TEST shall be conducted in accordance with Federal Specifications (QQ-W-461 H Class 3).
- (C) ELONGATION TEST shall be conducted in accordance with Federal Specifications (QQ-W-461 H Class 3).

Acceptance will be based on laboratory results or visual inspection.

9.2.21 Anchor Bars

Anchor bars for mattress units shall be Grade 40, or better, steel reinforcing bars of the dimensions shown on KTC Standard Drawing No. RDD-030-04.

9.2.22 Geotextile Fabric

Geotextile fabric for use as a filter beneath aggregate channel linings shall be a woven or non-woven fabric consisting only of long chain polymeric filaments or yarns such as polypropylene, polyethylene, polyester, polyamide or poly-vinylidene-chloride formed into a stable network such that the filaments or yarns retain their relative position to each other. The fabric shall be inert to commonly encountered chemicals, and free of defects or flaws which significantly affect its physical and/or filtering properties.

The fabric shall be formed in widths of at least 6 feet. Sheets of fabric may be sewn together to form fabric widths as required. The sheets of fabric shall be sewn together at the point of manufacture or other approved locations.

The geotextile manufacturer is responsible for establishing and maintaining a quality control program so as to assure compliance with the requirements of this Specification.

During all periods of shipment and storage, the fabric shall be wrapped in a heavy duty protective covering to protect the fabric from direct sunlight, ultraviolet rays and temperatures greater than 140°F, mud, dirt, dust, and debris.

The Contractor shall furnish, with each shipment of fabric, a Certificate of Compliance from the manufacturer of the fabric. The Certificate shall attest that the fabric meets the chemical, physical, and manufacturing requirements stated in this Specification. The Certificate also shall include actual test results for each physical requirement of this specification, as shown in the following table.

<u>Property</u>	<u>Minimum Value</u> ¹	<u>Test Method</u>
Grab Strength (lbs.)	200	ASTM D 4632

Elongation (%)	15	ASTM D 4632
Sewn Seam Strength ² (lbs.)	180	ASTM D 4632
Puncture Strength (lbs.)	80	ASTM D 3787
Burst Strength (psi)	320	ASTM D 3786
Trapezoid Tear (lbs.)	50	ASTM D 4533
Apparent Opening Size (U.S. Std. Sieve)	Hole Size Equal to or Smaller than a U.S. #40 Sieve (0.425 mm)	Corps of Engineers Standards CW-02215
Permeability (cm/sec)	0.010	AASHTO M 288
Ultraviolet Degradation at 500 hours	70% Strength Retained for all Classes	ASTM D 4355
Flow Rate (gal./min./ft ²)	40	AASHTO M 288

¹Minimum. Use value in weaker principal direction. All numerical values represent minimum average roll value (i.e., test results from any sampled roll in a lot shall meet or exceed the minimum values in the table). Stated values are for non-critical, non-severe applications.

²Values apply to both field and manufactured seams.

9.2.23 Fastener Pins

Fastener pins for use when fabric is installed in underdrain systems shall be formed of No. 9 or heavier steel wire and shall be at least 12 inches long with a 4 inch right angle bend on one end.

Fastener pins shall be installed according to manufacturer's specifications. The Contractor will supply a set of specifications for the City of Shepherdsville's use.

9.3 EXECUTION OF WORK

9.3.1 Channel and Slope Stabilization

9.3.1.1 General

- (A) Site Preparation and Earthwork. Site preparation and earthwork shall be performed in accordance with Sections 2 and 3 of these Specifications. The area to receive channel lining, ditch lining or slope protection shall be graded and shaped to conform to the cross-sections indicated on the Plans, within a tolerance of plus or minus 0.2 foot from the slope lines and grades.
- (B) Geotextile Fabric. When shown on the Plans or in the Contract, geotextile fabric meeting the requirements of Section 9.2.22. shall be used as a filter between subgrade and aggregate channel lining, rip-rap slope protection mattresses and gabions. The fabric shall be placed in the manner and at the locations shown on the Plans. At the time of installation, fabric will be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation or storage. The surface to receive the fabric shall be prepared to a relatively smooth condition free of obstructions, debris or sharp objects that may puncture the fabric. Construction equipment will not be permitted to operate directly on the fabric. The fabric shall be protected at all times during construction from contamination by surface runoff and any fabric so contaminated shall be removed and replaced with uncontaminated fabric. Fabric shall be covered within fourteen (14) calendar days after placement; fabric not covered within the time shall be removed and replaced at the Contractor's expense if damage or deterioration is evident, as determined by the City of Shepherdsville. Fabric not covered within thirty (30) calendar days after placement shall be removed and replaced at no additional cost to the City of Shepherdsville. Field splices at edges or ends of the fabric made by sewing shall be sewn by use of a portable sewing machine which produces a lock stitch. The thread shall be of a material meeting the chemical requirements specified for the plastic yarn. The adjacent sheets of fabric shall be sewn the full length of the boundary between them. The strength across the seam shall be at least 90 percent of the fabric strength in that direction. Geotextile fabric shall be placed with the long dimension parallel to the channel or toe of slope and shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. If more than one strip is necessary, the strips shall overlap a minimum of 18 inches. Transverse laps shall be placed so that the upstream strip laps over the downstream strip. Horizontal laps shall be placed so that the lower strip laps over the upper strip. Laps may be eliminated provided the joint is sewn as specified.

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

The fabric shall be protected from damage due to the placement of the slope protection or channel lining by limiting the height of drop of the material to no greater than 3 feet or by placing a cushioning layer of sand on top of the fabric before dumping the material, at the Contractor's option. The Contractor shall demonstrate that the placement technique will prevent

damage to the fabric. Placement of material shall begin at the toe and proceed up the slope.

9.3.1.2 Grassed Channel Lining

Grassed channel lining shall be established in accordance with the seeding or sodding procedures outlined above. When shown on the Plans, erosion control blankets shall be utilized for protection in lieu of mulch and netting.

9.3.1.3 Erosion Control Blankets

Installation requirements shall be in accordance with manufacturer's instructions and the Contract Documents. If any conflict exists between these methods, the more stringent requirements shall be met unless otherwise directed by the City of Shepherdsville. Contractor shall submit the manufacturers recommended installation method to the City of Shepherdsville for approval. The area to be covered shall be properly prepared, fertilized and seeded in accordance with these Specifications before the blanket is placed. The blanket shall be unrolled in the direction of the water flow. When using two blankets side by side in the ditch, the seam shall not be in the center of the ditch, but offset by 6 to 12 inches. The blanket shall be butted snugly at their ends and sides and secured.

The blankets shall be secured using staples driven vertically in the ground. Four staples shall be used at the start of each roll. Staples shall be placed in rows on each side and in the middle at intervals of 2 feet. Two rows of staples shall be placed alternately between the side and middle row of staples at 2 feet intervals.

9.3.1.4 Turf Reinforcement Mats

Turf reinforcement mats shall be installed in strict accordance with the Contract Documents and the manufacturer's installation requirements. If any conflict exists between these methods, the more stringent requirements shall be met unless otherwise directed by the City of Shepherdsville. The Contractor shall submit the manufacturers recommended installation method to the City of Shepherdsville for approval. No substitution may be made for the Turf Reinforcement Mat specified in the Contract unless it is directed by the City of Shepherdsville.

9.3.1.5 Class II and III Channel Lining

Channel Lining Class II and III shall be constructed to the dimensions shown on the Plans or directed by the City of Shepherdsville. The stone may be dumped in place, and the placing shall be conducted in a manner to produce a surface of approximate regularity, varying no more than 3 inches from a true

plane. Hand placing will not be required except as necessary to correct any surface irregularities exceeding the specified tolerance.

9.3.1.6 Rip-Rap Slope Protection

Unless otherwise shown on the Plans or unless solid rock is encountered, rip-rap slope protection shall begin in a trench 2 feet below the natural ground. Where solid rock is encountered, the lower terminus of the slope protection shall be keyed into rock.

Rip-rap shall be constructed to a minimum thickness of 2 feet measured perpendicular to the slope unless otherwise specified in the Contract. The stone may be dumped in place and placing shall be conducted in a manner to produce a surface of approximate regularity not varying more than 6 inches from a true plane.

9.3.1.7 Mattresses

Construction requirements shall be in accordance with the manufacturer's instructions and with these Specifications. If any conflict exists between these methods, the more stringent requirements shall be met unless otherwise directed by the City of Shepherdsville. The Contractor shall submit the manufacturer's recommended assembly method to the City of Shepherdsville for approval.

In assembling the mattresses, a single mattress base shall first be removed from the bundle, unfolded flat on the ground, and flattened to remove any kinks and bends. The mattress shall then be assembled individually, by erecting the sides, ends and diaphragm(s), ensuring that all creases are in the correct position and the tops of all sides level. The four corners of the mattress shall be laced first, after overlapping the mesh, followed by lacing the edges of the internal diaphragm(s) to the sides. The recommended lacing procedures consist of cutting a length of lacing wire approximately 1 1/2 times the distance to be laced, not to exceed five (5) feet, securing the wire terminal at the corner by looping and twisting, then proceeding to lace with alternating single and double loops at approximately four (4) to five (5) inch intervals.

The assembled mattresses are carried to the job site and placed in their proper location. For structural integrity, all adjoining empty mattresses must be laced along the perimeter of their contact surfaces in order to obtain a monolithic structure.

Mattresses may be filled by almost any type of earth-handling equipment such as backhoe, gradall, crane, etc. Along all exposed mattress edges, the outer layer of stone shall be carefully placed and packed by hand in order to

ensure proper alignment and a neat, compact, square appearance. The last layer of stone shall be level with or slightly higher than the top of the mattress to allow proper closing of the lid.

The lids shall be stretched tight over the fill, using crowbars or lid closing tools, until the lid meets the perimeter edges of the front and end panels. The lid shall then be tightly laced along the edges, ends and diaphragm(s) in the same manner as described for assembling mattresses per manufacturer's recommendation. Adjacent lids may be wired down simultaneously. All ends of wire shall be turned into mesh on completion of each mattress.

WELL-PACKED FILLING WITHOUT UNDUE BULGING AND WITH SECURE LACING IS ESSENTIAL IN ALL STRUCTURES.

If the mattress unit is placed on a grade, the placing of the stone shall begin at the bottom of the slope and progress upgrade.

When a complete mattress unit cannot be installed on the slope because of space limitations, the unit shall be cut to fit, in the manner indicated on the Plans.

When mattress units are placed on a 5% or greater grade, or when otherwise required, anchor bars shall be driven in place at the locations shown on the KTC Standard Drawing No. RDD-030-04.

9.3.1.8 Gabions

Construction requirements shall be in accordance with the manufacturer's instructions and with these Specifications. If any conflict exists between these two methods, the more stringent requirements shall be met unless otherwise directed by the City of Shepherdsville.

Individual gabion baskets shall be assembled by placing flat on the ground, flattening any kinks or bends, and then erecting the sides, ends and diaphragms. All creases shall be in the correct position and the tops of all sides level. The four corners of the gabions shall be laced together with alternating single and double loops at 5 inch intervals, with both sides of the lacing wire secured by looping and twisting. Internal diaphragms shall be installed, and laced in a similar way. Lacing wire should be cut to a length of approximately 1 1/2 times the distance to be laced-not to exceed five (5) feet. Individual assembled baskets shall be placed in their proper location and all adjoining gabions connected. This connection shall be accomplished using individual tie wires looped and twisted at approximately 3 inch intervals along the entire perimeter of the contact surfaces.

Gabions may be filled by almost any means of earth-handling equipment such as backhoe, gradall, crane, etc. Along all exposed gabion faces, the outer layer of stone shall be carefully placed and packed by hand in order to ensure proper alignment and a neat, compact, square appearance.

Each course of gabions shall be stretched to proper alignment by partially filling the first gabion in line for anchorage, and stretching the connected gabions, in increments not to exceed 100 linear feet, using a come-along or other means of at least one-ton capacity. Gabions shall be kept in tension while being filled. Gabion joints shall be controlled to avoid any unraveling. Gabions shall be carefully filled in one-foot layers, in a manner that will minimize voids. Two connecting wires shall be placed in each direction between each layer in all cells by looping lacing wire around two mesh openings in the front and back face, and in the ends and diaphragms. The ends of the connecting wires shall be securely twisted to prevent their loosening under tension.

Cells in each course of gabions shall be filled in stages, i.e. at no time shall any cell be filled to a depth exceeding one foot more than the adjoining cell. The last layer of stone shall be leveled with the top of the gabion to allow proper closing of the lid and provide an even surface for the next course. Lids shall be stretched tight over the stone fill using crowbars or similar methods, until the lid meets the edges of the front and ends. The lid shall be tightly tied along all edges, ends, and diaphragms in the same manner as required for connecting adjoining gabions.

Succeeding courses of tiers shall be placed and connected as specified for the first course. Baskets for succeeding courses shall be placed so vertical joints are offset at least 18 inches from course to course, unless otherwise shown on the Plans or Standard Drawings. Gabions shall be placed as headers or stretchers in accordance with the Standard Drawings. Each course of gabions shall be tied to the lower course after stretching but before filling, by use of individual tie wires and diaphragms. Vertical edges at each end of the wall that are not connected to an adjoining gabion shall be reinforced by looping and twisting individual tie wires at approximately 3 inch spacing the full length of such edges.

Place backfill behind gabion walls simultaneously with the gabion construction operation in accordance with Section 3.3.5 of these Specifications.

Care shall be exercised during all gabion wall construction to ensure the stone fill is firmly in place, bulging or distortion of the filled baskets is minimal, and all lacing and tying is thoroughly wound, looped and twisted to preclude loosening in service.

9.3.1.9 Concrete Paved Channels and Ditches

- (A) Subgrade Preparation. Soft or yielding materials shall be removed, replaced with suitable earth materials, and compacted to provide a firm foundation. Material type and method of application shall be submitted by the Contractor and approved by the City of Shepherdsville. The subgrade shall be moist when concrete is placed.
- (B) Concrete Work. The requirements for concrete formwork, reinforcement, placing concrete, removal of forms, removal of defective concrete, curing and finishing of concrete as defined in Section 6 of these Specifications shall apply to the construction of concrete channel and ditch lining.
- (C) Drainage. Weep holes, consisting of 4 inch pipe or formed to 4 inches in diameter, covered on the backside with geotextile fabric and stone, shall be placed at horizontal intervals not to exceed 20 feet in concrete paved ditch walls, unless shown otherwise on the Plans. The outlet invert elevations of weep holes in channel walls shall be placed 4 inches above the water surface level of the channel. Adequate provisions shall be made for thorough drainage of backfill as specified in Section 206.03.05 of the 1998 KTC Specifications or as shown on the Plans.
- (D) Joints. Transverse expansion joints shall be provided as shown on the Plans or Standard Drawings in concrete channels and at all existing concrete structures and as instructed by the City of Shepherdsville. Expansion joints shall be constructed at right angles to the centerline of the channel and throughout the channel bottom and sidewalls in conformance with the Plans. The thickness of the preformed expansion joint material shall be as directed by the City of Shepherdsville and shall be to the full depths of the slab and walls. Formed or sawed transverse contraction joints (1/2 the depth of the concrete) will be required at 20 foot maximum intervals along concrete paved ditches. Contraction joints shall be placed or installed as soon as the concrete initial set will allow.
- (E) Reinforcement. Steel reinforcing bars shall be used as reinforcement in vertical sidewalls and slabs for concrete channel lining. Polypropylene fibers shall be used as reinforcement in concrete ditch or sloped channel wall lining unless shown otherwise on the Plans.
- (F) Finish. Sidewalls for concrete paved channels shall be given an ordinary surface finish and the bottom slab shall be given a floated surface finish as defined in Section 6 of these Specifications.

Concrete paved ditches shall be given a floated surface and broom finish. Concrete paved channels shall be tool edged when finishing.

- (G) Concrete Storm Drains. Existing and new storm drains intercepted by the channel shall be formed into sidewalls and cut off flush and smooth with the inside face of the wall so as to not leave obstructions along the wall. Channel sidewalls shall be poured monolithically around pipe sections. Intercepted drains shall be oriented at right angles to the wall or skewed in the direction of the channel flow. The steel reinforcement shall be placed around each pipe end as it intersects the channel wall in accordance with the Plans. Existing pipe intercepted by the channel shall be extended as required for proper connection and pipe extensions will be of the same material as the existing pipe.
- (H) Backfilling. Immediately after the concrete has set sufficiently and the forms have been removed, the spaces on each side of the ditch paving shall be filled with suitable earth material and thoroughly compacted. Full backfill behind vertical channel sidewalls shall not be placed until representative test samples of the concrete used in the channel lining attain a compressive strength of 3,500 pounds per square inch. In addition, the concrete shall have been placed a minimum of seven days. Backfill shall be brought up simultaneously behind the sidewalls to maintain uniform loading. Placement and compaction of the backfill shall be in accordance with Section 3 of these Specifications.

9.3.2 Site Restoration.

9.3.2.1 General

- (A) Planning. The Contractor shall notify the City of Shepherdsville at least 48 hours in advance of the time he intends to begin sowing seed or placing sod and shall not proceed with such Work until permission to do so has been granted by the City of Shepherdsville. Before starting seeding or sodding operations on any area, final dressing and the preparation of the seed bed or sod bed shall have been completed in accordance with these Specifications. All seeding, sodding and related operations shall be continuous operations. The following schedule shall be followed for seeding or sodding operations, unless otherwise permitted or directed by the City of Shepherdsville.

<u>Work Item</u>	<u>Accepted Work Interval</u>
Permanent Seeding	Feb. 15 to May 15 or

9.3.2.2 Topsoiling

Topsoil Replacement

Topsoil shall be replaced at no additional cost to the City of Shepherdsville.

Site Preparation

Maintain grades on the areas to be topsoiled according to the Plans. Adjust grades and elevations for receipt of topsoil.

Subsoil Roughening

Immediately prior to spreading topsoil, loosen the subgrade by disking or scarifying to a depth of at least 4 inches to ensure bonding of the topsoil and subsoil. If no amendments have been incorporated, loosen the soil to a depth of at least 6 inches before spreading topsoil.

Spreading Topsoil

Uniformly distribute topsoil to a minimum compact depth of 2 inches on 3:1 slopes and 4 inches on flatter slopes. Do not spread topsoil while it is frozen or muddy or when the subgrade is wet or frozen.

Correct any irregularities in the surface that result from topsoiling or other operations to prevent the formation of depressions or water pockets.

Compact the topsoil enough to ensure good contact with the underlying soil, but avoid excessive compaction as it increases runoff and inhibits seed germination. Light packing with a roller is required where high-maintenance turf is to be established.

9.3.2.3 Permanent Seeding.

- (A) Preparing the Seed Bed for Turf and Natural Areas. Each area to be seeded shall be scarified, disked, harrowed, raked, or otherwise worked until it has been loosened and pulverized to a depth of not less than three inches. Stones and other foreign materials shall be removed. This operation shall be performed only when the soil is in a tillable and workable condition. Grade 10-10-10 fertilizer, at the rate of not less than 25 pounds per 1,000 square feet, and agricultural limestone, at the rate of not less than 100 pounds per 1,000 square feet, shall be distributed evenly over the seed bed, unless other requirements are shown on the Plans or in the Contract. The limestone and fertilizer shall be lightly harrowed, raked, or otherwise

incorporated into the soil for a depth of approximately one-half inch. Fertilizer need not be incorporated in the soil as specified above when mixed with seed in water and applied with hydraulic equipment. The Contractor shall apply the seed, fertilizer and mulch within 24 hours of preparing the seed bed.

The lime/fertilizer rates shall not relieve the Contractor of his responsibility to provide the proper amounts of these materials. The Contractor is encouraged to have soil analyses performed (at the Contractor's expense) to establish proper lime/fertilizer rates so that satisfactory turf growth is promoted.

- (B) Seeding for Turf. Permanent seed shall be sown as soon as preparation of the seed bed has been completed and thoroughly watered after seeding. Care shall be exercised not to wash seeding by overwatering. Seed shall be sown uniformly by means of a rotary seeder, wheelbarrow seeders, hydraulic equipment, or other satisfactory means, and unless otherwise shown on the Plans or in the Contract, at the rates indicated in Section 9.2.4. Permanent seeding shall be performed only when the soil is in a tillable and workable condition, and only during the acceptable work intervals given in Section 9.3.2.1 (A) of these specifications, unless otherwise permitted or directed by City of Shepherdsville.
- (C) Seeding for Natural Areas. Seeding shall be done, weather permitting, within seven days of all topsoiling. Do not seed if soil is excessively dry or is saturated. Seed during favorable weather conditions. Mix seed with two-thirds of a bushel of moist vermiculite or one-half rate of seed oats per acre prior to sowing. No covering of seed with soil is required. Seeding shall be performed by one of these methods:
- (D) Hand Broadcasting. Hand broadcast seed over open area by walking and sowing seed first in one direction, then walking perpendicular to the first direction while sowing the remaining seed for that area. Rake lightly or drag area to cover seed no deeper than ¼ inch. Roll seeded areas with a water filled roller upon completion of seeding.
- (E) Mechanical Power Drawn Seeder. Sowing shall be performed by a mix mechanical power drawn broadcast seeder capable of uniformly mixing and broadcasting all seed sizes listed in the seed mix. Seed to be planted not deeper than ¼ inch. Seeding operation shall be kept as close as possible to the contours and not up and down slopes. After seeding, cover seed using drag mat. Then compact with land roller, such as a cultipacker or equivalent. With proper equipment, drag matting and cultipacking in one operation is satisfactory.

- (F) Protection for Turf. Placing of materials for protection shall follow seeding as soon as possible, and no later than 48 hours after seeding. In no instance shall the mulch be placed on crusted seeded areas, and any eroded areas shall be repaired and reseeded before protection is applied. The materials shall be placed uniformly, all clumps loosened and scattered, and care shall be taken to avoid thicker applications than those specified.

After the seeding has been satisfactorily completed, the following methods of protection shall be used:

- (G) Straw Mulch Crimping. Straw mulch may be crimped or punched into the soil to a depth of 2 inches to 4 inches using a mulch anchoring tool or a dull, serrated farm disk that is set straight. Crimping shall not cut the mulch. This method shall be used in flat areas and on slopes no steeper than 3H:1V and only where equipment can be operated safely. Machinery shall be operated on the contour. Straw mulch material shall be applied at a rate of 90 lbs per 1,000 square feet.
- (H) Straw Mulch and Netting. This method shall be used on slopes 3H:1V or steeper. Installation of the netting shall be in accordance with the KTC Standard Drawing No. RRE-002-03. Straw mulch material used under netting shall be plain straw and shall be applied at the rate of 90 lbs per 1,000 square feet.
- (I) Tackifier. When approved by the City of Shepherdsville, synthetic/chemical binders and tackifiers may be used in lieu of the above methods for protecting seeded areas. No asphalt emulsions shall be allowed.
- (J) Hydromulch. When approved by the City of Shepherdsville, hydromulch may be used in lieu of the above methods for protecting seeded areas. Wood cellulose fiber mulch shall be applied at the rate of 40 pounds per 1,000 square feet.
- (K) Erosion Control Blankets. Manufactured erosion control blankets (straw, coconut fiber, wood fiber, etc.) shall be utilized when shown on the Plans, as directed by the City of Shepherdsville, or at the Contractor's option in lieu of straw mulch or hydromulch. The areas to be covered shall be properly prepared, fertilized and seeded in accordance with these Specifications before the blanket is placed. The blankets shall be installed according to the manufacturer's specifications. In general, however, the blankets shall be unrolled in the direction of surface water flow. When using two blankets side by

side in a ditch, the seam shall not be in the center of the ditch, but offset by 6 to 12 inches. Individual blanket rolls shall be butted snugly at their ends and sides, and properly secured. The blankets shall be secured using staples driven vertically in the ground. Staple patterns should be in accordance with the manufacturer's specifications. Loose blanket edges shall be stapled and buried in trenches according to the manufacturer's specifications.

Use only the specified erosion control blankets or blankets that meet or exceed their specifications when they are specified on the Plans or in the Contract. When the Contractor elects or is directed to use erosion control blankets to achieve improved protection over conventional mulching and netting or hydromulch, the following guidelines shall be used to select the appropriate blanket type:

<u>Blanket Type</u>	<u>Comments</u>
Straw/Netting Matrix	Generally provides effective protection for 2H:1V to 4H:1V slopes, or low flow swales. Usually degrades in 30 to 90 days, depending on product.
Straw/Coconut/Netting Matrix	Generally provides effective protection for 2H:1V to 1H:1V slopes of medium flow channels. Can provide protection for 6 months to more than one growing season, depending on the product.
Coconut/Netting Matrix	Generally provides long lasting protection (up to 2 years) for slopes of 1H:1V or steeper, or for high discharge channels, depending on the product.
Wood Fiber/Netting Matrix	Light to heavy duty wood fiber blankets are available with short to long term protection capabilities, similar to coconut/straw blankets.
(L) <u>Seed-Incorporated Erosion Control Blankets.</u>	Seed-incorporated erosion control blankets (straw, coconut fiber, wood fiber, etc.) shall

be utilized when shown on the Plans, as directed by the City of Shepherdsville. The areas to be covered shall be properly prepared and fertilized in accordance with these Specifications before the blanket is placed. The blankets shall be installed according to the manufacturer's specifications and the requirements given under Item 9.3.2.3(D) of these specifications.

- (M) Stage II Topdressing. A second application of slow release fertilizer (Grade 20-10-10) shall be applied to seeded areas no sooner than 6 weeks after seeding, but not until a satisfactory stand of vegetation exists. For spring seedings, the fertilizer shall not be applied after May 1, and for fall seedings, the fertilizer shall not be applied after December 1. For spring seedings performed during the period of March 15 to May 15, the Stage II fertilizer shall not be applied until after September 1. The fertilizer shall be distributed evenly over the new grass area at a rate of 12 pounds per 1,000 square feet.
- (N) Maintenance and Repair. For turf areas, all seeded areas shall be cared for and maintained properly to the City of Shepherdsville's satisfaction until final acceptance of the Work and for the duration of the guarantee period. Such care shall include, but not be limited to, watering as necessary, fertilizing, reseeding and repairing of mulch materials as required, and mowing the seeded areas when required by the City of Shepherdsville. When mowing is required, mower blades shall be set at 3 inches for sufficient height to protect the vitality of the growth. Areas which have been previously seeded and mulched in accordance with this Section, but which have been eroded, damaged or failed to successfully establish a stand of grass, shall be repaired as directed by the City of Shepherdsville. All material and labor required to maintain and repair seeded areas shall be furnished by the Contractor at no cost to the City of Shepherdsville. If the City of Shepherdsville directs the Contractor to place additional fertilizer on the area to be reseeded, an additional 4 pounds of agricultural limestone will be required for each additional pound of fertilizer. Natural (native grasses and forbs) areas shall not be mowed.

9.3.2.4 Sodding

- (A) Cutting Sod. Prior to cutting sod, the grass shall be mowed to a height of no more than 3 inches and the mowed area shall be raked to eliminate all clippings, cuts and trash. The sod shall be cut in rectangular sections as required. Sections may vary in length not exceeding 8 feet, but shall be of uniform width of 10 inches or more, and shall be cut to a depth of at least 1 inch and no more than 2 inches. The sod shall be cut to such thickness that practically all of the dense root system will be retained but exposed in the sod strip,

and to such width and length so that it can be handled without undue tearing and breaking. When cut in strips, the sod shall be rolled without damage with the grass folded inside.

The sod shall be cut by means of an approved mechanical sod cutter. During dry weather, the sod shall be watered before cutting to prevent loss of soil while handling. The sod shall not be cut when in a sufficiently wet condition which could interfere with proper handling. All sod must be delivered to the Project and placed within 18 hours after being cut.

- (B) Preparation of Sod Bed. The sod bed shall be loosened to a minimum depth of one inch and shaped to a smooth even surface and shall be graded to such elevation so the sod, when in place, shall be flush with any adjacent seeded or turfed area, pavement, curb, or other structures, except when otherwise directed.

Prior to placing the sod, the fertilizer (Grade 10-10-10) and limestone shall be applied uniformly at the rate specified in Subsection 9.3.2.3; and shall be harrowed, raked, or otherwise incorporated into the soil. The sod bed, when dry, shall be moistened to the loosened depth.

- (C) Placing Sod. Sod shall be placed within 18 hours of being cut and it shall not be placed when the atmospheric temperature is below 32°F, or when the sod or sod bed is frozen, or during other weather or soil conditions detrimental to the Work.

The sod shall be carefully placed by hand so that each section closely joins the adjacent section without overlapping. All open spaces or gaps shall be plugged with sod cut to the appropriate size and shape. When placed on slopes, the sod shall be laid with the long edges of the strips parallel to the contour starting at the bottom of the slope. Successive strips shall be neatly matched and all joints staggered or broken. The sodding shall be carried at least 18 inches beyond the top of the slope to prevent surface water from undermining the sod.

When placed on slopes 2H:1V or steeper and 6 feet or more in height, and in all sodded ditches, each strip or section of sod shall be staked securely with at least 2 wood stakes or wire staples no more than 2 feet apart and driven flush with the surface. Wire staples shall not be used in residential areas.

The sod, after it is placed, shall be wetted thoroughly and tamped or rolled sufficiently to incorporate the roots into the sod bed and to ensure tight joints between the sections or strips.

- (D) Maintenance and Repair. The sod shall be watered as frequently as necessary to maintain and assure it in a moist and living state. After a period of two weeks, or as otherwise directed by the City of Shepherdsville, but not during June, July or August, 20-10-10 fertilizer shall be applied at the rate of 6.0 pounds per 1,000 square feet, and the sod given an additional watering to enhance growth. The Contractor shall not allow any equipment or material to be placed on any sodded area and shall erect suitable barricades and guards to prevent his equipment, labor, or the public from traveling on or over any area planted with sod. Care shall include periodic watering, fertilizing and mowing as necessary to maintain the vitality and appearance of the sod. When mowing is required, mower blades shall be set at 3 inches for sufficient height to protect the vitality of the growth. Sodded areas that become eroded, damaged or failed to successfully establish a stand of grass, shall be repaired and/or replaced as directed by the City of Shepherdsville. All material and labor required to maintain and repair sodded areas shall be furnished by the Contractor at no cost to the City of Shepherdsville. Sod must be living at the time of final acceptance of the Project and through the duration of the warranty period.

9.3.3 CLEAN UP

9.3.3.1 Daily Clean Up

During the progress of the Work, the Contractor shall daily maintain all areas within the limits of his operations from accumulations of waste materials, rubbish and other debris resulting from the Work.

9.3.3.2 Final Clean Up

Before final acceptance of the Work, all rights-of-way, easements, and access roads used by the Contractor, all streams in and over which he has worked, and all ground occupied by the Contractor in connection with the Work shall be cleaned of all debris, construction plant, and materials. Right-of-way and easement areas not designated for alteration by the Contract shall be restored to their original condition in accordance with the Plans and Specifications. Areas which have been sodded or seeded and mulched in accordance with this Section, but which have been eroded, damaged or failed to successfully establish a stand of grass, shall be repaired as directed by the City of Shepherdsville. Waste and debris shall be disposed of in areas approved by the City of Shepherdsville and provided by the Contractor outside of the rights-of-way and easements.

N O T I C E

**DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
INDIVIDUAL PERMIT/LETTER OF PERMISSION AUTHORIZATION
KENTUCKY DIVISION OF WATER INDIVIDUAL 401 WQC**

PROJECT: Bullit County, Item No. 5-117

The Section 404 activities for this project have been permitted under the authority of the Department of the Army Nationwide Individual Permit via a Letter of Permission and Kentucky Division of Water Individual Permit. Impacts shall be limited to those listed within the attached permits and all conditions shall be followed.

If there is need to cross the stream channel with heavy equipment or conduct work from within the stream channel a working platform or temporary crossing is authorized. This should be constructed with clean rock and sufficient pipe to allow stream flow to continue unimpeded.

In order for this authorization to be valid, the attached conditions must be followed. The contractor shall post a copy of this Approval in a conspicuous location at the project site for the duration of construction and comply with the general conditions as required.

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



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

October 3, 2013

Operations Division
Regulatory Branch (South)
ID No. LRL-2009-214

Mr. Danny Peake
Kentucky Transportation Cabinet
Division of Environmental Analysis
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Peake:

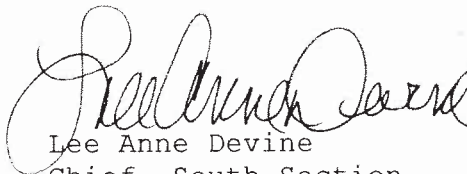
This is in regard to your September 26, 2013, request for a modification to Department of the Army (DA) Permit LRL-2009-214, which authorized the impacts to two perennial streams, nine intermittent streams, ten ephemeral streams, and nine wetlands located in the Brooks Run and Bluelick Creek watersheds. The impacts are associated with the realignment of US 61 between John Harper Highway and KY 44 in Shepherdsville, Bullitt County, Kentucky. Your request indicated the need for a time extension to complete the proposed project. This requested modification is approved. The above referenced permit will expire on December 31, 2015.

This approval is granted in accordance with the plans included in the February 25, 2009 application for Kentucky Transportation Cabinet, Item No. 05-117.00. All other conditions of the original permit remain in full force and effect.

A copy of this letter will be sent to the appropriate coordinating agency (see enclosure for address).

If we can be of any further assistance, please contact us at the above address, ATTN: CELRL-OP-FS, or call Ms. Jennifer Thomason at 502-315-6679.

FOR THE DISTRICT ENGINEER:


Lee Anne Devine
Chief, South Section
Regulatory Branch

Enclosure



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

September 27, 2013

David Waldner, Director
Division of Environmental Analysis
200 Mero St 6th Fl
Frankfort, KY 40601

Re: Water Quality Certification #2009-013-1R(2)
KY 61 - Bullitt Co
2nd RENEWAL
KYTC Item No. 5-117.00
AI No.: 35022
Activity ID: APE20130001
Bullitt County, Kentucky

Dear Mr. Waldner:

Pursuant to Section 401 of the Clean Water Act (CWA), the Commonwealth of Kentucky certifies it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 303, 304, 306, and 307 of the CWA, will not be violated by the above referenced project provided that the U.S. Army Corps of Engineers authorizes the activity under 33 CFR part 330, and the attached conditions are met.

All future correspondence on this project must reference **AI No. 35022**. **The attached document is your official Water Quality Certification; please read it carefully.** If you should have any questions concerning the conditions of this water quality certification, please contact (502) 564-3410.

Sincerely,

A handwritten signature in black ink that reads "James Bicknell".

James Bicknell, WQC Project Manager
Water Quality Certification Section
Kentucky Division of Water

JB:JB

Attachment

cc: Jennifer Thomason, USACE: Louisville District
Lee Andrews, USFWS: Frankfort
Danny Peake, KYTC: DEA

KTC Water Quality Certification
KY 61 - Bullitt Co
Facility Requirements
Permit Number: WQC#2009-013-1R2
Activity ID No.: APE20130001

AAZ0000000001 (KYTC Item No 5-117.00) KY 61 Relocation and Widening 2nd RENEWAL:

Submittal/Action Requirements:

Condition No.	Condition
S-1	The Kentucky Transportation Cabinet shall submit notification: Due prior to construction commencement to the Water Quality Certification Section of the Kentucky Division of Water. This notification shall consist of payment verification for the in-lieu-fee payment amount of no less than \$289,300.00 to the Kentucky Department of Fish and Wildlife Resources Stream Restoration Fund. [Clean Water Act]

Narrative Requirements:

Condition No.	Condition
T-1	The work approved by this certification shall be limited to: - the loss of 458 linear feet of unnamed intermittent stream 1 due to culvert construction (Station 8+720). - the loss of 198 linear feet of unnamed intermittent stream 2 due to culvert construction (Station 8+695). - the loss of 5 linear feet of unnamed intermittent stream 3 due to the placement of fill material (Station 8+693). - the loss of 174 linear feet of unnamed intermittent stream 4 due to culvert construction (Station 8+446). - the loss of 24 linear feet of unnamed intermittent stream 5 due to culvert construction (Station 8+452). - the loss of 275 linear feet of unnamed intermittent stream 6 due to culvert construction (Station 7+928). - the loss of 229 linear feet of unnamed perennial stream 1 due to culvert construction and channel relocation (Station 8+603). - the loss of 215 linear feet of unnamed intermittent stream 8 due to culvert construction (Station 6+580). - the loss of 1315 linear feet of unnamed intermittent stream 8 due to culvert construction (Stations 4+389 and 4+131). - the loss of 0.672 acres of jurisdictional wetlands 1, 2, 4, 5, 6, 7, 8, and 9 due to the placement of fill material. [Clean Water Act]

T-2	The Kentucky Division of Water requires compensatory mitigation for 2,893 linear feet of intermittent and perennial stream impacts associated with this project. The Kentucky Division of Water will require a payment of no less than \$289,300.00 be made to the Kentucky Department of Fish and Wildlife Resources (KDFWR) Stream Restoration Fund. The USACE may require a different amount. [Clean Water Act]
T-3	This certification shall serve as the first Water Quality Certification renewal (as requested by the Kentucky Transportation Cabinet). Additional requests to renew this certification in the future may require further review and additional changes to the originally requested amount of stream mitigation by the Kentucky Division of Water. At that time, the most current and accepted stream mitigation calculations and requirements may be utilized. [Clean Water Act]

KTC Water Quality Certification

KY 61 - Bullitt Co
Facility Requirements
Permit Number: WQC#2009-013-1R2
Activity ID No.: APE20130001

AAZZ0000000001 (continued):

Narrative Requirements:

Condition No.	Condition
T-4	All work performed under this certification shall adhere to the design and specifications set forth in the "Application for Letter of Permission and Section 401 Water Quality Certification, Kentucky Highway 61 Realignment Project" package received by the Kentucky Division of Water on February 27, 2009. [Clean Water Act]
T-5	The Kentucky Transportation Cabinet shall notify the Kentucky Division of Water, Water Quality Certification Section, at the commencement of construction. [Clean Water Act]
T-6	The Kentucky Transportation Cabinet shall notify the Kentucky Division of Water, Water Quality Certification Section, when the project's construction is complete. [Clean Water Act]
T-7	The Kentucky Transportation Cabinet is responsible for preventing degradation of waters of the Commonwealth from soil erosion. An erosion and sedimentation control plan must be designed, implemented, and maintained in effective operating condition at all times during construction. [Clean Water Act]
T-8	The Division of Water reserves the right to modify or revoke this certification should it be determined that the activity is in noncompliance with any condition set forth in this certification. [Clean Water Act]
T-9	If construction does not commence within two years of the date of this renewed certification, this certification will become void. A letter requesting a renewal should be submitted. [Clean Water Act]
T-10	Other permits may be required from the Division of Water for this project. If this project takes place within the floodplain, a permit may be required from the Surface Water Permits Branch. The contact person is Todd Powers. If this project will disturb one acre or more of land, a KPDES general storm water permit will be required from the Surface Water Permits Branch. The contact person is Allen Ingram. Both can be reached at 502-564-3410. [Clean Water Act]



STEPHEN L.
BESHEAR
GOVERNOR

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

LEONARD K. PETERS
SECRETARY

ATTENTION APPLICANT

If your project involves one or more of the following activities, you may need more than one permit from the Kentucky Division of Water.

***building in a floodplain *road culvert in a stream**

***streambank stabilization *stream cleanout**

***utility line crossing a stream**

***construction sites an acre or more**

- **If the project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a Kentucky Pollution Discharge Elimination System (KPDES) stormwater permit shall be required from the Operational Permits Section. This permit requires the creation of an erosion control plan.**

Contact Allen Ingram.

- **Projects that involve filling in the floodplain will require a stream construction permit from the Floodplain Management Section.**

Contact Barry Elmore.

- **Projects that involve work IN a stream, such as bank stabilization, road culverts, utility line crossings, and stream alteration will require a stream construction permit and a Water Quality Certification from the Water Quality Certification Section.**

Contact Alan Grant.

All three contacts listed above can be reached at 502/564-3410. A complete listing of environmental programs administered by the Kentucky Department for Environmental Protection is available from Pete Goodman by calling 502/564-3410.

GENERAL CONDITIONS FOR WATER QUALITY CERTIFICATION

1. Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
2. All dredged material shall be removed to an upland location and/or graded on adjacent areas (so long as such areas are not regulated wetlands), to obtain original streamside elevations, i.e. overbank flooding shall not be artificially obstructed.
3. In areas not riprapped or other wise stabilized, revegetation of stream banks and riparian zones shall occur concurrently with project progression. At a minimum, revegetation will approximate pre-disturbance conditions.
4. To the maximum extent practicable, all instream work under this certification shall be performed during low flow.
5. Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances where such instream work is unavoidable, then it shall be performed in such a manner and duration as to minimize resuspension of sediments and disturbance to substrates and bank or riparian vegetation.
6. Any fill or riprap including refuse fill, shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If riprap is utilized, it is to be of such weight and size that bank stress or slump conditions will not be created because of its placement.
7. If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when work will be done.
8. Removal of existing riparian vegetation should be restricted to the minimum necessary for project construction.
9. Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling 800/564-2380.



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX; (502) 315-6677
<http://www.lrl.usace.army.mil/>
January 27, 2010

3 FEB '10 AM 11:36

Operations Division
Regulatory Branch (South)
ID No. LRL-2009-214-let

Mr. David Waldner
Kentucky Transportation Cabinet
Division of Environmental Analysis
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Waldner:

This is in regard to your application for a Department of the Army (DA) permit dated February 25, 2009 concerning a plan to realign US 61 between John Harper Highway and KY 44 in Sheperdsville, Bullitt County, Kentucky. We have reviewed your application and submitted information and have made the following determinations: the work is minor in nature, will not have a significant impact on the environment and should encounter no opposition.

Based on these determinations, the proposed work satisfies the Letter of Permission (LOP) criteria, as specified in our regulations and the procedures outlined in the LOP No. 200600259-pgj. Therefore, you are authorized, in accordance with Section 404 of the Clean Water Act (CWA), to impact two perennial streams, nine intermittent streams, ten ephemeral streams, and nine wetlands located in the Brooks Run and Bluelick Creek Watersheds. This permission is granted with the following conditions:

1. The project shall be constructed in accordance with plans included in the February 25, 2009 application for Kentucky Transportation Cabinet, Item No. 05-117.00.
2. You shall install and maintain adequate erosion/sedimentation controls around all disturbed earthen areas until such time as those areas have been stabilized and revegetated.
3. You shall pay an in-lieu mitigation fee payment of \$339,000 to the Kentucky Department of Fish and Wildlife Resources Kentucky Stream and Wetland Mitigation Trust Fund. Written proof of payment must be provided to the U.S. Army Corps of Engineers, Louisville District prior to conducting work in "waters of the United States".
4. The time limit for completing the work authorized ends on **December 31, 2013**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.
5. Upon completion of construction you are to notify the District Engineer. The enclosed Completion Report form must be completed and returned to this office.
6. You must agree to comply with the enclosed General Conditions.

This authorization will be effective as soon as we receive your signed acceptance of these conditions. Please sign and date the duplicate copy of this letter in the space provided and return the signed copy in the enclosed envelope. Note that we also perform periodic inspections to ensure compliance with our permit conditions and appropriate Federal laws.

This letter contains a proffered permit for the realignment of US 61 project. If you object to this decision, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this decision you must submit a completed RFA form to the Great Lakes and Ohio River Division Office at the following address:

Ms. Pauline Thorndike
US Army Corps of Engineers
Great Lakes and Ohio River Division
550 Main Street, Rm 10032 CELRD-CM-O
Cincinnati, OH 45201-3222

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **March 23, 2010**. It is not necessary to submit an RFA form to the Division Office if you do not object to the decision in this letter.

Also enclosed with this proffered permit is a preliminary jurisdictional determination (JD). A preliminary jurisdictional determination is not appealable and impacting "waters of the U.S." identified in the preliminary JD will result in you waiving the right to request an approved JD at a later date. An approved JD may be requested (which may be appealed), by contacting me for further instruction.

Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

FOR THE DISTRICT ENGINEER:

Sincerely,



Layna Thrush
Project Manager, South
Regulatory Branch

Enclosures

(I accept the conditions of this authorization):


Kentucky Transportation Cabinet

2/5/10
Date

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): 10 April 2009

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:

Mr. Danny Peake
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

Represented by:
Redwing Ecological Services, Inc.
1139 South Fourth Street
Louisville, KY 40203

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: CELRL, KY 61 Realignment Project, LRL-2009-214

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:

Extends from south central portion of Brooks USGS 7.5 minute quadrangle to northwest corner of Shepherdsville quadrangle, generally following the existing KY 61 from John Harper Highway to KY 44

(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: Kentucky County/parish/borough: Bullitt City: Shepherdsville

Center coordinates of site (lat/long in degree decimal format): Lat. N 38.025°, Long. W 85.694°

Name of nearest waterbody: Brooks Run and Bluelick Creek

Identify (estimate) amount of waters in the review area:

Non-wetland waters: 5,701 linear feet: width (ft) and/or 0.533 acres.

Cowardin Class: R3UB1, R4SB3, R4SB5

Stream Flow: Perennial

Wetlands: 0.744 acres.

Cowardin Class: PEM1, PFO1

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal:

Non-Tidal:

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date:

Field Determination. Date(s): 9 April 2009

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable. This preliminary JD finds that there "may be" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply)

checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Redwing, March, 2009.
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps:
- Corps navigable waters' study:
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: 1:24,000 – Brooks and Shepherdsville.
- USDA Natural Resources Conservation Service Soil Survey. Citation: Soil Survey Geographic Database for Bullitt County, Kentucky (2004).
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps: FEMA Q3 Flood Data (1998). Bullitt County, Kentucky.
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): FSA NAIP Ortho Imagery from kygeonet.ky.gov (2004).
or Other (Name & Date): Site photographs January 19, 20, 21 & February 13, 2009.
- Previous determination(s). File no. and date of response letter:
- Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Layna Thrush 4/14/09
Layna Thrush
Regulatory Project Manager
(REQUIRED)

Dan Peake 4/14/2009
Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining the
signature is impracticable)

Feature	Stream Length (ft)	Acreage	Latitude (decimal degrees)	Longitude (decimal degrees)
Perennial Stream 1	250	0.017	N 38.051	W 85.680
Perennial Stream 2 (Brooks Run)	281	0.145	N 38.035	W 85.690
Perennial Stream 3 (Blue Lick Creek)	302	0.139	N 38.027	W 85.693
Perennial Stream Total	833	0.301		
Intermittent Stream 1	481	0.022	N 38.051	W 85.680
Intermittent Stream 2	231	0.013	N 38.051	W 85.679
Intermittent Stream 3	19	0.001	N 38.051	W 85.679
Intermittent Stream 4	206	0.007	N 38.049	W 85.680
Intermittent Stream 5	24	0.001	N 38.049	W 85.680
Intermittent Stream 6	387	0.031	N 38.045	W 85.683
Intermittent Stream 7	198	0.016	N 38.020	W 85.700
Intermittent Stream 8	1,389	0.048	N 38.017	W 85.703
Intermittent Stream 9	33	0.003	N 37.998	W 85.712
Intermittent Stream Total	2,967	0.143		
Ephemeral Stream 1	295	0.010	N 38.041	W 85.685
Ephemeral Stream 2	380	0.013	N 38.041	W 85.685
Ephemeral Stream 3	275	0.022	N 38.030	W 85.693
Ephemeral Stream 4	105	0.002	N 38.022	W 85.698
Ephemeral Stream 5	38	0.003	N 38.021	W 85.698
Ephemeral Stream 6	59	0.002	N 38.019	W 85.700
Ephemeral Stream 7	360	0.017	N 38.010	W 85.707
Ephemeral Stream 8	129	0.006	N 38.008	W 85.708
Ephemeral Stream 9	34	0.002	N 37.998	W 85.712
Ephemeral Stream 10	226	0.013	N 38.017	W 85.703
Ephemeral Stream Total	1,902	0.093		
Wetland 1	--	0.012	N 38.051	W 85.680
Wetland 2	--	0.024	N 38.049	W 85.680
Wetland 3	--	0.046	N 38.021	W 85.698
Wetland 4	--	0.055	N 38.021	W 85.698
Wetland 5	--	0.018	N 38.019	W 85.700
Wetland 6	--	0.020	N 38.016	W 85.703
Wetland 7	--	0.009	N 38.015	W 85.704
Wetland 8	--	0.040	N 38.001	W 85.710
Wetland 9	--	0.532	N 38.017	W 85.703
Wetland Total		0.756		
Total Jurisdictional Waters	5,701	1.290		

Notes:

*All aquatic resources are non-section 10 (non-tidal)

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Kentucky Transportation Cabinet	File Number: LRL-2009-214	Date: 27 Jan 2010
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
X	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Layna Thrush
US Army Corps of Engineers – Louisville District
PO Box 59
Louisville, KY 40201-0059
(502) 315-6689

If you only have questions regarding the appeal process you may also contact:

Mike Montone
US Army Corps of Engineers – Great Lakes and Ohio River Div
CELRD-PDS-O
550 Main Street, Rm 10032
Cincinnati, OH 45201-3222
(513) 684-6212

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date:

Telephone number:

GENERAL CONDITIONS:

1. Discharges of dredged or fill material into "waters of the U.S." must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site). In determining the minimal impact threshold, the Districts will consider the direct, secondary, and cumulative impacts of the fill or work and any mitigation measures.
2. The permittee shall provide a mitigation/monitoring plan for impacts resulting from the placement of fill into "waters of the U.S." in excess of 300 linear feet of intermittent or perennial stream; the filling of greater than 0.10 acre (4,356 sq. feet) of waters of the U.S; or work causing more than minimal effects, to compensate for impacts to the "waters of the U.S." These impact thresholds are applied for each crossing. When mitigation is required, the permittee will develop the mitigation site concurrently with, or in advance of, the site construction unless the Corps determines on a project specific basis that it is not practical to do so. This will ensure that aquatic functions are not lost for long periods of time (e.g. temporal loss) which could adversely affect water quality and wildlife. The requirement for conservation easements or deed restrictions will be determined on a project specific basis.
3. The permittee shall ensure that sedimentation and soil erosion control measures are in place prior to commencement of construction activities. These measures will remain in place and be properly maintained throughout construction. Sedimentation and soil control measures shall include the installation of straw bale barriers, silt fencing and/or other approved methods to control sedimentation and erosion. Sedimentation and erosion controls will not be placed in "waters of the U.S." except if specifically approved by the District.
4. The permittee shall ensure that areas disturbed by any construction activity, including channel and stream banks, are immediately stabilized and revegetated with a combination of non-invasive plants (grasses, legumes and shrubs) which are compatible with the affected area and will not compete with native vegetation.
5. The permittee shall ensure that no in-stream construction activity is performed during periods of high stream flow or during the fish spawning season (April 1 through June 30) without first contacting the Kentucky Department of Fish and Wildlife Resources (KDFWR) for their expertise on impacts to the fishery resource. Additionally, the discharge of dredged and/or fill material in known waterfowl breeding and wintering areas must be avoided to the maximum extent practicable.
6. The permittee will ensure that the activity authorized will not disrupt movement of those aquatic species indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's specific purpose is to impound water.
7. The permittee shall ensure that all construction equipment is refueled and maintained on an upland site away from existing streams, drainageways and wetland areas. Heavy equipment working in wetlands must be placed on mats or other measures must be taken to minimize soil disturbance.

8. The permittee must comply with any case specific special conditions added by the Corps or by the State Section 401 Water Quality Certification (WQC). The conditions imposed in the State Section 401 WQC are also conditions of this LOP.

9. The permittee shall ensure that no activity authorized by the LOP may cause more than a minimal adverse effect on navigation.

10. The permittee shall ensure proper maintenance of any structure or fill authorized by the LOP, in good condition and in conformance with the terms and conditions of the LOP, including maintenance to ensure public safety. The permittee is not relieved of this requirement if the permitted activity is abandoned, although the permittee may make a good faith transfer to a third party. Should the permittee wish to cease to maintain the authorized activity or desire to abandon it without a good faith transfer, the permittee must obtain a modification to the LOP from the Corps, which may require restoration of the area.

11. The permittee shall not perform any work within any Wild and Scenic Rivers or in any river officially designated as a "study river" for possible inclusion in the system, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity authorized by the LOP will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal Land Management agency in the area (e.g. U.S. Forest Service, Bureau of Land Management, the National Parks Service, or the U.S. Fish and Wildlife Service).

12. The permittee shall not perform any work under the LOP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. The permittee shall notify the Corps and coordinate the proposed action with the USFWS to determine if any listed species or critical habitat might be affected and/or adversely modified by the proposed work. No activity is authorized under the LOP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed. At the direction of the Corps, the permittee shall complete the necessary consultation with the USFWS, satisfying the requirements of Section 7(a)(2) of the Endangered Species Act. The permittee shall not begin work until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. Authorization of an activity under the LOP does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act.

Obligations under Section 7 of the Act must be reconsidered by the Corps Districts if (1) new information reveals impacts of the proposed action may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during consultation, or (3) new species are listed or critical habitat designated that might be affected

13. The permittee shall not perform any activity under the LOP which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places until the District Engineer has complied with the provisions of 33 CFR Part 325, Appendix C. The permittee must notify the District Engineer if the activity authorized by the LOP may affect any historic properties listed, determined to be eligible or which the permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin construction until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the Kentucky Heritage Council.

If the permittee discovers any previously unknown historic or archaeological remains while accomplishing the activity authorized by the LOP, work must be immediately stopped and this office immediately notified regarding the discovery. The District will initiate the Federal, Tribal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

14. The permittee shall not perform any work under the LOP where the discharge of dredged and/or fill material will occur in the proximity of a public water supply intake.

15. No activity, including structures or work in "waters of the U.S." or discharges of dredged or fill material may consist of unsuitable materials (e.g. trash, debris, car bodies, asphalt, etc.) and that materials used for construction or discharge must be free from toxic pollutants in toxic amounts.

16. The permittee shall, to the maximum extent practicable, design the project to maintain pre-construction downstream flow conditions. Furthermore, the work must not permanently restrict or impede the passage of normal or expected high flows and the structure or discharge of fill must withstand expected high flows. The project must provide, to the maximum extent practicable, for retaining excess flows from the site and for establishing flow rates from the site similar to pre-construction conditions.

17. The permittee shall ensure that all temporary fills, authorized under the LOP, be removed in their entirety and the affected areas returned to pre-construction elevation.

18. Representatives from the Corps of Engineers and/or the State of Kentucky may inspect any authorized activity or mitigation site at any time deemed necessary to ensure compliance with the terms and conditions of the LOP, Section 401 WQC, and applicable laws.

19. All work authorized by this LOP must be completed within five years after the date of the Corps authorization letter. If you find you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least three months before the expiration date.

20. The permittee, after completion of work under the LOP, shall submit a signed certification letter regarding the completed work and required mitigation, if applicable. The certification letter will include a statement that the work was done in accordance with the LOP authorization including compliance with all general and special conditions and completion of mitigation work.

21. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of the LOP.

22. For Section 10 waters, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

ADDRESSES FOR COORDINATING AGENCIES

Mr. Todd Bowers
Wetlands Regulatory Section
USEPA, Region IV
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

Mr. Virgil Lee Andrews, Field Supervisor
U.S. Fish & Wildlife Service
J.C. Watts Federal Building, Room 265
330 West Broadway
Frankfort, Kentucky 40601

Ms. Sandra Gruzesky, Director
Kentucky Environmental and Public Protection Cabinet
Division of Water
200 Fair Oaks Lane, 4th Floor
Frankfort, Kentucky 40601

Dr. Jon Gassett, Commissioner
Kentucky Department of Fish and Wildlife Resources
#1 Game Farm Road
Frankfort, Kentucky 40601

Mr. Mark Dennen
Kentucky Heritage Council
State Historic Preservation Officer
300 Washington Street
Frankfort, Kentucky 40601

SPECIAL NOTE FOR CONSTRUCTION LIMITATIONS FROM U.S. FISH & WILDLIFE

THE AWARDED CONTRACTOR SHALL COMPLY WITH THE BIOLOGICAL OPINION DOCUMENT THAT WAS APPROVED BY THE U.S. FISH AND WILDLIFE SERVICE ON SEPTEMBER 10, 2015 AND WAS ISSUED TO THE KENTUCKY TRANSPORTATION CABINET VIA THE FEDERAL HIGHWAYS ADMINISTRATION.

DUE TO THE PRESENCE OF THE FEDERALLY LISTED THREATENED KENTUCKY GLADE CRESS PLANT SPECIES NEAR ALONG THE KENTUCKY HIGHWAY 61 CORRIDOR (KY-61), THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING CONDITIONS:

- * AREAS DISTURBED WITHIN THE PROJECT SECTION 1 (Item 5-117.10) DURING CONSTRUCTION THAT ARE NOT STABILIZED WITH RIP RAP OR EROSION BLANKET WILL BE SEEDED USING ONE OF THE FOLLOWING KYTC STANDARD SEED MIX TYPES:

SEED MIX TYPE I: 50% KENTUCKY 31 TALL FESCUE (FESTUCA ARUNDINACEA), 35% HARD FESCUE (FESTUCA LONGIFOLIA), 10% PERENNIAL RYEGRASS (LOLIUM PERENNE), AND 5% WHITE DUTCH CLOVER (TRIFOLIUM REPENS).

SEED MIX TYPE II: 60% KENTUCKY 31 TALL FESCUE, 20% PERENNIAL RYEGRASS, 10% (BASED ON PURE LIVE SEED) LITTLE BLUESTEM (SCHIZACHYRIUM SCOPARIUM), AND 10% PARTRIDGE PEA (CASSIA FASCICULATE).

SEED MIX TYPE III: 40% KENTUCKY 31 TALL FESCUE, 15% PERENNIAL RYEGRASS, 20% SERICEA LESPEDEZA (LESPEDEZA CUNEATA), 15% PARTRIDGE PEA, AND 10% (BASED ON PURE LIVE SEED) LITTLE BLUESTEM.

- * IN ORDER TO AVOID HABITAT MODIFICATION AND ENCROACHMENT OF INVASIVE SPECIES NEAR KNOWN KENTUCKY GLADE CRESS POPULATIONS, AREAS DISTURBED WITHIN THE PROJECT SECTION 2 (Item 5-117.20) DURING CONSTRUCTION THAT ARE NOT STABILIZED WITH RIP RAP OR EROSION BLANKET WILL BE SEEDED USING THE FOLLOWING SEED MIX:

MODIFIED SEED MIX: 10% REDTOP (AGROSTIS ALBA), 35% CREEPING RED FESCUE (FESTUCA RUBRA), 35% CHEWINGS FESCUE (FESTUCA RUBRA VAR. COMMUTATE), AND 20% PERENNIAL RYEGRASS.

**SPECIAL NOTE FOR
CONSTRUCTION LIMITATIONS FROM U.S. FISH & WILDLIFE
(CONTINUED)**

- * KENTUCKY GLADE CRESS 'IMPACT SITE 1' IS LOCATED NORTH OF THE EXISTING KY-61 WEST OF THE I-65 OVERPASS (38.0222° N LATITUDE, 85.6976° W LONGITUDE). IT CONSISTS OF TWO SMALL CEDAR GLADES, COMPRISING 0.16 ACRES, SURROUNDED BY MATURE WOODS TO THE NORTH AND WEST AND YOUNG WOODS TO THE SOUTH AND EAST. THIS SITE IS LOCATED OUTSIDE OF THE DISTURBED LIMITS OF THE PROPOSED PROJECT (SEE FIGURE 5 KENTUCKY GLADE CRESS IMPACT SITE 1 DEVELOPMENT MAP); HOWEVER, PROTECTIVE ACTIONS WILL BE REQUIRED NEAR THIS AREA AND ADJACENT ACTIVITIES SHOULD COMPLETED AS TO AVOID ANY DIRECT, INDIRECT, OR CUMULATIVE EFFECTS TO THIS KENTUCKY GLADE CRESS POPULATION.

- * A SILT FENCE WILL BE INSTALLED ON THE UPHILL (SOUTHERN) BOUNDARY OF IMPACT SITE 1 PRIOR TO CONSTRUCTION TO INHIBIT DIRECT ENCROACHMENT OF SEDIMENT AND OTHER CONTAMINANTS TO IMPACT SITE 1. THE SILT FENCE WILL BE INSTALLED IN SUCH A WAY THAT THE BOTTOM EDGE WILL BE UNDER THE SURFACE OF THE GROUND TO PREVENT SEDIMENT FROM PASSING UNDERNEATH IT.

- * SILT FENCING AND/OR EXCLUSION FENCING WILL BE PLACED AROUND IMPACT SITE 1 AND SURROUNDING AREA TO ENSURE THAT CONSTRUCTION EQUIPMENT DOES NOT ENTER THE SITE AND DISTURBANCE DOES NOT OCCUR.

- * ALL UTILITY RELOCATIONS REQUIRED FOR THE PROJECT WILL BE ROUTED AROUND IMPACT SITE 1 TO AVOID DIRECT IMPACTS TO THE KENTUCKY GLADE CRESS POPULATION.

- * A WATER LINE WILL BE ROUTED APPROXIMATELY 5.5 METERS (18 FEET) DOWN-GRADIENT FROM THE WESTERN-MOST GLADE AT IMPACT SITE 1 AND APPROXIMATELY 3 METERS (10 FEET) FROM THE SINGLE INDIVIDUAL LOCATED SOUTHWEST OF THIS GLADE. PRIOR TO CONSTRUCTION, EXCLUSION FENCING WILL BE INSTALLED ALONG THE EASTERN EDGE OF THE DISTURBANCE LIMITS. THE DISTURBANCE LIMITS FOR THE WATER LINE INSTALLATION WILL BE RESTRICTED TO 1.5 METERS (5 FEET) ON EACH SIDE OF THE CENTERLINE. EXCAVATED SOILS WILL BE BACKFILLED OR HAULED AWAY AND PLACED IN AN UPLAND AREA.

**SPECIAL NOTE FOR
CONSTRUCTION LIMITATIONS FROM U.S. FISH & WILDLIFE
(CONTINUED)**

- * THE GAS LINE WILL BE ROUTED APPROXIMATELY 14 METERS (45 FEET) TO THE WEST AND OUTSIDE OF THE AREA THAT DRAINS INTO IMPACT SITE 1. THE DISTURBANCE LIMITS FOR THE GAS LINE INSTALLATION WILL BE RESTRICTED TO 1.5 METERS (5 FEET) ON EACH SIDE OF THE CENTERLINE. EXCAVATED SOIL WILL BE BACKFILLED OVER THE LINE OR HAULED AWAY AND PLACED IN AN UPLAND AREA.

- * AN OVERHEAD ELECTRICAL LINE WILL BE ROUTED APPROXIMATELY 10 METERS (33 FEET) SOUTHEAST OF IMPACT SITE 1 WITH ONE UTILITY POLE INSTALLED APPROXIMATELY 13 METERS (43 FEET) UP-GRADIENT OF THE SITE AND WITHIN THE DRAINAGE AREA OF IMPACT SITE 1. GROUND DISTURBANCE ASSOCIATED WITH THE UTILITY POLE INSTALLATION WILL BE MINIMIZED TO THE EXTENT PRACTICABLE, AND DISPLACED SOIL WILL BE BACKFILLED INTO THE HOLE AND AROUND THE POLE AFTER INSTALLATION.

- * THE PORTION OF KY-61 THAT RUNS ADJACENT TO THE SITE WILL BE WIDENED TO INCLUDE TWO ADDITIONAL TRAVEL LANES NORTH OF THE EXISTING ALIGNMENT, DECREASING THE DISTANCE BETWEEN THE ROADWAY AND IMPACT SITE 1. A DITCH LOCATED IN THE MEDIAN WILL COLLECT THE MAJORITY OF THE RUNOFF FROM THE NORTH-BOUND LANES OF KY-61 AND A PORTION OF THE SOUTH-BOUND LANES AND WILL DIRECT IT THROUGH A STORMWATER SYSTEM THAT DRAINS AROUND IMPACT SITE 1 TO THE EAST. THE REMAINING RUNOFF WILL SHEET FLOW FROM THE NORTHERN HALF OF THE ROAD DOWN TO THE ROAD EMBANKMENT, THROUGH THE MOWED FLAT AREA, AND DOWN THE WOODED HILLSLOPE SIMILAR TO THE EXISTING DRAINAGE CONDITIONS THROUGH IMPACT SITE 1.

- * IN THE UNFORSEEN EVENT THAT UNINTENDED SEDIMENT OR COSTRUCTION ACTIONS OCCUR WITHIN THE KENTUCKY GLADE CRESS IMPACT SITE 1, THE US FISH & WILDLIFE SERVICE, FRANKFORT FIELD OFFICE (502-695-0468) WILL BE NOTIFIED AND THE RESIDENT ENGINEER WILL HALT THE CONTRIBUTING ACTIVITY UNTIL APPROPRIATE REMEDIAL ACTIONS HAVE BEEN IMPLEMENTED. THE KYTC DIVISION OF ENVIRONMENTAL ANALYSIS (DAVE HARMON; 502-782-5016) SHALL ALSO BE NOTIFIED.

Source: World Imagery - Esri and the GIS User Community (2012); Project design provided by the Kentucky Transportation Cabinet.



Legend

- Kentucky Glade Cress Location
- Approximate Site 1 Drainage Area (0.11 acre)
- Project Corridor
- Proposed Limits of Disturbance
- Proposed Overpass
- Proposed Roadway
- Proposed Drain
- Relocated Overhead Line/Pole
- Relocated Gas Line
- Relocated Water Line
- Existing Utilities



KENTUCKY HIGHWAY 61
REALIGNMENT PROJECT
BULLITT COUNTY, KENTUCKY
KYTC ITEM NOS. 5-117.10 & 5-117.20
REVISED DATE: 06-23-15 | DRAWN BY: EDB/SRB



NOTE: HABITAT ASSESSMENT PERFORMED
BY REDWING ECOLOGICAL SERVICES, INC.
ON APRIL 1 AND 2, 2015.



KENTUCKY GLADE CRESS
SITE 1 DEVELOPMENT MAP
FIGURE 5

KYTC BMP Plan for Contract ID 151265



Kentucky Transportation Cabinet

Highway District 5 (1)

And

_____ **(2), Construction**

**Kentucky Pollutant Discharge Elimination System
Permit KYR10
Best Management Practices (BMP) plan**

Groundwater protection plan

For Highway Construction Activities

For

[Section 1 and 2 of the KY 61 Reconstruction project on new alignment in Bullitt County from Sta. 0+818.00 to Sta. 6+582 (Metric). The project begins south of the KY 61/ KY 44 intersection and ends just north of the Brooks Run creek crossing](1)

Contract ID 151265

Six Year Plan 2014

KYTC BMP Plan for Contract ID 151265

Project Information

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

1. Owner – Kentucky Transportation Cabinet, District 5 (1)
2. Resident Engineer: (2)
3. Contractor Name: (2)
 - Address: (2)
 - Phone number: (2)
 - Contact: (2)
 - Responsible Person: (3)
4. Contract ID Number: (2)
5. Route (Address): KY 61 (Preston Highway) in Bullitt County, KY (1)
6. Latitude/Longitude (project mid-point): 38° 00' 44" N, 85° 42' 21" W (1)
7. County (project mid-point): Bullitt County (1)
8. Project start date (date work will begin): 11/20/2015(2)
9. Projected completion date: 11/30/2018(2)

KYTC BMP Plan for Contract ID 151265

1.0 SITE DESCRIPTION.

- 1) Nature of construction activity (from letting project description). Reconstruct KY 61 in Bullitt County on new alignment. (1)
- 2) Order of major soil disturbing activities. (2) and (3)
- 3) Projected volume of material to be moved. 325, 390 CY (Total excavation) (1)
- 4) Estimate of total project area (acres). 99.7 (1)
- 5) Estimate of area to be disturbed (acres). 85.4 (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. (1)
- 7) Data describing existing soil condition. (1) & (2)
- 8) Data describing existing discharge water quality (if any). (1) & (2)
- 9) Receiving water name: Brooks Run creek, Blue Lick creek, Mud Run creek, unnamed tributary to Salt River. (1)
- 10) TMDLs and Pollutants of Concern in Receiving Waters. (1 DEA)
- 11) Site Map. Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.
- 12) Potential sources of pollutants. The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include oil/fuel/grease from servicing and operating construction equipment, concrete washout water, sanitary wastes and trash/debris. (3)

2.0 SEDIMENT AND EROSION CONTROL MEASURES.

2.1 Erosion Control Sheets. 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.

2.2 Annotations. 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

KYTC BMP Plan for Contract ID 151265

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 BMPs 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 BMPs in place before being disturbed.

2.3 Disturbed Drainage Areas. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:

- A) 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.
- B) Sources.** At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.
- C) Clearing and Grubbing.** The following BMPs will be considered and used where appropriate.
 - 1) Leaving areas undisturbed when possible.
 - 2) Silt Basins to provide silt volume for large areas.
 - 3) Silt Traps Type A for small areas.
 - 4) Silt Traps Type C in front of existing and drop inlets which are to be saved.
 - 5) Diversion ditches to catch sheet runoff and carry it to basins or traps or to divert it around areas to be disturbed.
 - 6) Brush and/or other barriers to slow and/or divert runoff.
 - 7) Silt fences to catch sheet runoff on short slopes. For longer slopes, multiple rows of silt fence may be considered.
 - 8) Temporary Mulch for areas which are not feasible for the fore mentioned types of protections.
 - 9) Non-standard or innovative methods.
- D) Cut and Fill and Placement of Drainage Structures.** The BMP Plan will be modified to show additional BMPs such as:
 - 1) Silt Traps Type B in ditches and/or drainways as they are completed.
 - 2) Silt Traps Type C in front of pipes after they are placed.
 - 3) Channel Lining
 - 4) Erosion Control Blanket
 - 5) Temporary Mulch and/or seeding for areas where construction activities will be ceased for 21 days or more.
 - 6) Non-standard or innovative methods.

KYTC BMP Plan for Contract ID 151265

- E) Profile and X-Section in Place.** The BMP Plan will be modified to show elimination of BMPs which had to be removed and the addition of new BMPs as the roadway was shaped. Probably changes include:
- 1) 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.
 - 2) Additional Silt Traps Type B and Type C to be placed as final drainage patterns are put in place.
 - 3) Additional Channel Lining and/or Erosion Control Blanket.
 - 4) Temporary Mulch for areas where Permanent Seeding and Protection cannot be done within 21 days.
 - 5) Special BMPs such as Karst Policy.
- F) Finish Work (Paving, Seeding, Protect, etc.).** A final BMP Plan will result from modifications during this phase of construction. Probable changes include:
- 1) Removal of Silt Traps Type B from ditches and drainways if they are protected with other BMPs which are sufficient to control erosion, i.e. Erosion Control Blanket or Permanent Seeding and Protection on moderate grades.
 - 2) Permanent Seeding and Protection.
 - 3) Placing Sod.
 - 4) Planting trees and/or shrubs where they are included in the project.
- G) Post Construction.** BMPs including Storm Water Management Devices such as velocity dissipation devices and Karst policy BMPs to be installed during construction to control the pollutants in storm water discharges that will occur after construction has been completed are: N/A (1)

3.0 OTHER CONTROL MEASURES.

- 1) Solid Materials. 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

KYTC BMP Plan for Contract ID 151265

Resident Engineer if there are 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.

2.4 Good Housekeeping. The following good housekeeping practices will be followed onsite during the construction project.

- 1) An effort will be made to store only enough product required to do the job.
- 2) 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.
- 3) Products will be kept in their original containers with the original manufacturer's label.
- 4) Substances will not be mixed with one another unless recommended by the manufacturer.
- 5) Whenever possible, all of the product will be used up before disposing of the container.
- 6) Manufacturers' recommendations for proper use and disposal will be followed
- 7) The site contractor will inspect daily to ensure proper use and disposal of materials onsite.

2.5 Hazardous Products. These practices will be used to reduce the risks associated with any and all hazardous materials.

- 1) Products will be kept in original containers unless they are not re-sealable.
- 2) Original labels and material safety data sheets (MSDS) will be reviewed and retained
- 3) Contractor will follow procedures recommended by the manufacturer when handling hazardous materials.
- 4) If surplus product must be disposed of, manufacturers' or state/local recommended methods for proper disposal will be followed.

2.6 The following product-specific practices will be followed onsite:

A) Petroleum Products. Vehicles and equipment that are fueled and maintained on site will be monitored for leaks, and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.

KYTC BMP Plan for Contract ID 151265

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.

- B) 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.
- C) 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.
- D) 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
- E) 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:
 - 1) 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.
 - 2) 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.
 - 3) All spills will be cleaned up immediately after discovery.
 - 4) The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
 - 5) Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
 - 6) The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
 - 7) Spills of products will be cleaned up promptly. Wastes from spill clean up will be disposed in accordance with appropriate regulations.

4.0 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

KYTC BMP Plan for Contract ID 151265

technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state or local officials. N/A (1)

5.0 MAINTENANCE. 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)

6.0 INSPECTIONS. Inspection and maintenance practices that will be used to maintain erosion and sediment controls:

- 1) All erosion prevention and sediment control measures will be inspected by the contractor at least once each week and following any rain of one-half inch or more.
- 2) 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.
- 3) Inspection reports will be written, signed, dated, and kept on file.
- 4) Areas at final grade will be seeded and mulched within 14 days.
- 5) 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.
- 6) All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of being reported and completed within 5 days.
- 7) Built-up sediment will be removed from behind the silt fence before it has reached halfway up the height of the fence.
- 8) Silt fences will be inspected for bypassing, overtopping, undercutting, depth of sediment, tears, and to ensure attachment to secure posts.
- 9) 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.
- 10) 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.
- 11) 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.
- 12) 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.

KYTC BMP Plan for Contract ID 151265

7.0 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:

- 1) Water from water line flushings.
- 2) Water form cleaning concrete trucks and equipment.
- 3) Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
- 4) 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.

8.0 GROUNDWATER PROTECTION PLAN.

This plan serves as the groundwater protection plan as required by 401 KAR 5:037.

Contractor’s statement: (3)

The following activities, as enumerated by 401 KAR 5:037 Section 2. (2) requiring the preparation and implementation of a groundwater protection plan, will or may be may be conducted as part of this construction project:

_____ (e) Land treatment or land disposal of a pollutant;

_____ (f) Storing, treating, disposing, or related handling of hazardous waste, solid waste or special waste, or special waste in landfills, incinerators, surface impoundments, 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);

_____ (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;

_____ (j) Storing or related handling of road oils, dust suppressants, or deicing agents at a central location;

_____ (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);

_____ (m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes, (this does not include bore holes for the purpose of explosive demolition);

Or, check the following only if there are no qualifying activities

KYTC BMP Plan for Contract ID 151265

_____ There are no activities for this project as listed in 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan.

The contractor is responsible for the preparation of a plan that addresses the 401 KAR 5:037 Section 3. (3) Elements of site specific groundwater protection plan:

- (a) General information about this project is covered in the Project information;
- (b) Activities that require a groundwater protection plan have been identified above;
- (c) Practices that will protect groundwater from pollution are addressed in section C. Other control measures.
- (d) Implementation schedule – all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity;
- (e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provide to the resident engineer.
- (f) Areas of the project and groundwater plan activities will be inspected as part of the weekly sediment and erosion control inspections
- (g) Certification (see signature page.)

KYTC BMP Plan for Contract ID 151265

Contractor and Resident Engineer Plan Certification

The contractor that is responsible for implementing this BMP plan is identified in the Project Information section of this plan.

The following certification applies to all parties that are signatory to this BMP plan:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, this plan complies with the requirements of 401 KAR 5:037. By this certification, the undersigned state that the individuals signing the plan have reviewed the terms of the plan and will implement its provisions as they pertain to ground water protection.

Contractor and Resident Engineer Certification:

(3)
Signed _____ title _____ , _____
typed or printed name¹ signature

(2)
Signed _____ title _____ , _____
typed or printed name² signature

1. *Contractors Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Contract ID number and KPDES number when one has been issued.*
2. *KYTC Note: to be signed by the Chief District Engineer or a person designated to have the authority to sign reports by such a person (usually the resident engineer) in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601 Reference the Contract ID number and KPDES number when one has been issued.*

KYTC BMP Plan for Contract ID 151265

Sub-Contractor Certification

The following sub-contractor shall be made aware of the BMP plan and responsible for implementation of BMPs identified in this plan as follows:

Subcontractor Name:

Address:

Phone:

The part of BMP plan this subcontractor is responsible to implement is:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System permit that authorizes the storm water discharges, the BMP plan that has been developed to manage the quality of water to be discharged as a result of storm events associated with the construction site activity and management of non-storm water pollutant sources identified as part of this certification.

Signed _____ title _____ , _____
typed or printed name *signature*

- 1. Sub Contractor Note: To be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Contract ID number and KPDES number when one has been issued.*

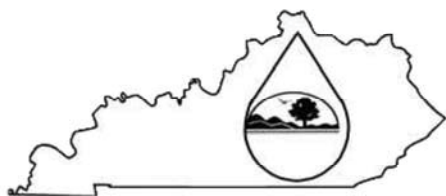


Welcome to the Department for Environmental Protection eForms Application.

Error: The desired eForm is invalid, has been removed from the catalog, or has expired.

<p>Option B: Select this option to retrieve a previously saved or submitted eForm.</p> <p>The check box allows you to use previously saved/submitted eForms as a "template". The system will generate a new eForm Transaction ID and allow you to submit the new form to DEP.</p>	<p>Enter your eForm Transaction ID to retrieve the latest version of your form:</p> <p>bc4b6061-d64f-4c48-bec3-69e7dd4ad53f</p> <p><input type="checkbox"/> I want a NEW eForm with the values from the previously saved/submitted ID.</p> <p>Proceed</p>
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User Interface issues: 1. This website requires browser versions Internet Explorer 10+, Firefox 26+, and Chrome 34+. Firefox and Chrome are the recommended browsers. 2. This website requires Adobe Flash. 3. For Security reasons, the website only supports 45 minutes to complete data entry at any given time and will 'timeout', preventing the ability to save or submit your data. Please keep this in mind when filling out an eForm and remember to save often. 4. Please note that the Internet Explorer Browser uses the Backspace key as a Hot-Key for the Back button (Previous Page). When selecting values from a Dropdown List, using the backspace key will take you to the previous page and you will need to reenter your information.



Kentucky Pollutant Discharge Elimination (KPDES)

Notice of intent (NOI) for coverage of Storm Water Discharge Associated with Construction Activities Under the KPDES Storm Water General Permit KYR100000

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

I. Facility Operator Information

Operator Name(s) (*)	KYTC - District 5	Phone(*)	502-210-5400
Mailing Address(*)	8310 Westport Road	Status of Owner/Operator	State
City(*)	Louisville	State(*)	Kentucky
		Zip (*)	40242

II. Facility/Site Location Information

Name of Project (*)	KY 61 Reconstruction (Sections 1 & 2)	Physical Address (*)	KY 61	City(*)	Shepherdsville
State(*)	Kentucky	Zip(*)	40165	County (*)	Bullitt
Latitude (Decimal Degrees) (*)	38.01222 DMS to DD Converter	Longitude (Decimal Degrees) (*)	-85.705833	SIC Code (*)	1611

III. Site Activity Information

a. For single projects provide the following information:

Total Number of acres in project:	99.7
Total Number of acres to be disturbed:	85.4
Anticipated Start Date	11/20/2015
Anticipated Completion Date	11/30/2018

b. For common plans of development provide the following information:

Total number of acres in project	
Number of individual lots in development, if applicable	
Number of lots to be developed	
Total acreage of lots intended to be developed	
Total acreage intended to be disturbed	
Number of acres intended to be disturbed at any one time	
Anticipated start date	
Anticipated completion date	
List Contractor(s)	<input type="text"/> Company Name(*) Add New

IV. If the permitted site discharges to a water body the following information is required

Name of Receiving Water (*)	Brooks Run
Anticipated number of discharge points	5
Location of Anticipated discharge points	<input type="text"/> Latitude(s) <input type="text"/> Longitude(s) Add New
Receiving Water Body Stream-Use Designation	<input type="checkbox"/> Cold Water Aquatic Habitat <input type="checkbox"/> Domestic Water Supply <input type="checkbox"/> Outstanding State Resource Water <input type="checkbox"/> Primary Contact Recreation <input type="checkbox"/> Secondary Contact Recreation <input checked="" type="checkbox"/> Warm Water Aquatic Habitat
Antidegradation Categorization	

Name of Receiving Water	Bluelick Creek						
Anticipated number of discharge points	12						
Location of Anticipated discharge points	<table border="1"> <tr> <td></td> <td>Latitude(s)</td> <td>Longitude(s)</td> </tr> <tr> <td>Add New</td> <td></td> <td></td> </tr> </table>		Latitude(s)	Longitude(s)	Add New		
	Latitude(s)	Longitude(s)					
Add New							
Receiving Water Body Stream-Use Designation	<input type="checkbox"/> Cold Water Aquatic Habitat <input type="checkbox"/> Domestic Water Supply <input type="checkbox"/> Outstanding State Resource Water <input type="checkbox"/> Secondary Contact Recreation <input type="checkbox"/> Primary Contact Recreation <input checked="" type="checkbox"/> Warm Water Aquatic Habitat						
Antidegradation Categorization							

V. If the permitted site discharges to a MS4 the following information is required

Name of MS4	DOT						
Number of discharge points to the MS4							
Location of each discharge point	<table border="1"> <tr> <td></td> <td>Latitude(s)</td> <td>Longitude(s)</td> </tr> <tr> <td>Add New</td> <td></td> <td></td> </tr> </table>		Latitude(s)	Longitude(s)	Add New		
	Latitude(s)	Longitude(s)					
Add New							
Date of application/notification to the MS4 for construction site permit coverage							

VI. Construction activities in or along a water body

Will the project require construction activities in a water body or the riparian zone?	Yes
If Yes, describe scope of activity	Construction of a 3-span bridge over Blue Lick Creek. There are no piers located in the creek.
Is a Clean Water Act 404 permit required?	Individual
Is a Clean Water Act 401 Water Quality Certification required?	Individual

VII. NOI Preparer Information

First Name (*)	Stephen	Middle Initial	L	Last Name (*)	Arnold
Mailing Address (*)	1046 East Chestnut Street	City (*)	Louisville	State (*)	Kentucky
Zip (*)	40204	Phone (*)	502-585-2222	eMail Address (*)	sarnold@qk4.com

VIII. Attachment(s)

Topographic map(*)	<input type="button" value="Upload File(s)"/> <table border="1"> <tr> <td>Files</td> <td></td> </tr> <tr> <td> 5-117 %1 %2 %NOI_Topo 140728.pdf (3.0MB)</td> <td>Remove</td> </tr> </table>	Files		5-117 %1 %2 %NOI_Topo 140728.pdf (3.0MB)	Remove
Files					
5-117 %1 %2 %NOI_Topo 140728.pdf (3.0MB)	Remove				
Supplemental Information	<input type="button" value="Upload File(s)"/>				

IX. Certification

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

Signature (*)	Matt Bullock	First Name (*)	Matt	Date (*)	9/4/2015
Middle Initial		Last Name (*)	Bullock		
Contact eMail Address (*)	matt.bullock@ky.gov	Contact Phone (*)	502-210-5400		

WHO MUST FILE A NOTICE OF INTENT (NOI) FORM

Federal law at 40 CFR Part 122 prohibits point source discharges of stormwater associated with industrial activity to a water body of the Commonwealth of Kentucky without a Kentucky Pollutant Discharge Elimination System (KPDES) permit. The operator of an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under the KPDES Storm Water General Permit. If you have questions about whether you need a permit under the KPDES Storm Water program, or if you need information as to whether a particular program is administered by the state agency, call the **Storm Water Contact, Operational Permits Section, Kentucky Division of Water at (502) 564-3410.**

WHERE TO FILE NOI FORM

<https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7>

Electronic NOI-SWCAs are to be submitted a minimum of seven (7) working days prior to commencement of construction related activities.

COMPLETING THE FORM

Enter information in the appropriate areas only. (*) denotes a required field. Enter N/A (Not Applicable) for fields that are required but do not apply to your submission. If you have any questions regarding the completion of this form call the **Storm Water Contact, Operational Permits Section, at (502) 564-3410.**

SECTION I - FACILITY OPERATOR INFORMATION

Operator Name(s): Enter the name or names of all operators applying for coverage under KYR10 using this NOI.

Mailing Address, City, State, and Zip Code: Provide the mailing address of the primary operator

Phone No.: Provide the telephone numbers of the person who is responsible for the operation.

Status of Owner/Operator: Select the appropriate legal status of the operator of the facility from the dropdown list.

Federal

Public (other than federal or state)

State

Private

SECTION II - FACILITY/SITE LOCATION INFORMATION

Name of Project: Provide the name of the project.

Physical Address, City, State, Zip Code and County: Provide the physical address of the project.

Latitude/Longitude: Provide the general site latitude and longitude of the operation.

SIC Code: Enter the Standard Industrial Code for the project

SECTION III - SITE ACTIVITY INFORMATION

For single projects provide the following information:

Total number of acres in project: Indicate the total acreage of the project including both disturbed and undisturbed areas.

Total number of acres to be disturbed: Indicate the total number of acres of the project to be disturbed.

Anticipated start date: Indicate the approximate date of when construction activities will begin.

Anticipated completion date: Indicated the approximate date of when final stabilization will be achieved.

For common plans of development provide the following information:

Total number of acres in project: Indicate the total acreage of the project including both disturbed and undisturbed areas.

Number of individual lots in development, if applicable: Indicate the number of individual lots or unit in the common plan of development

Number of lots to be developed: Indicate the number of lots that you intend to develop.

Total acreage of lots intended to develop: Indicate the total acreage of the lots you intend to develop.

Total acreage intended to disturb: Indicate the total acreage of the lots you intend to disturb

Number of acres intended to disturb at any one time: Indicate the maximum number of acres to be disturbed at any one time.

Anticipated start date: Indicate the approximate date of when construction activities will begin.

Anticipated completion date: Indicated the approximate date of when final stabilization will be achieved.

List of contractors: Provide the names of all known contractors that will be working on site.

SECTION IV – IF THE PERMITTED SITE DISCHARGES TO A WATER BODY THE FOLLOWING INFORMATION IS REQUIRED

Name of Receiving Water: Provide the names of the each water body receiving discharges from the site. Provide only official USGS names do not provide local names.

Anticipated number of discharge points: Indicate the number of discharge points to each receiving water body.

Location of anticipated discharge points: Provide the latitude and longitude of each discharge point. Add points as necessary.

Receiving Water Body Stream Use Designation: Check all appropriate boxes.

Antidegradation Categorization: Select from the drop down box one of the following:

Outstanding National Resource Water

Exceptional Water

High Quality Water

Impaired Water

SECTION V – IF THE PERMITTED SITE DISCHARGES TO A MS4 THE FOLLOWING INFORMATION IS REQUIRED

Name of MS4: Provide the name of the MS4 to which the activity will discharge.

Number of discharge points to the MS4: Indicate the number of discharge points.

Location of each discharge point: Provide the latitude and longitude of each discharge point. Add points as necessary

Date of application/notification to the MS4 for construction site permit coverage: Indicate the date the MS4 has or will be notified.

SECTION VI – CONSTRUCTION ACTIVITIES IN OR ALONG A WATER BODY

Will the project require construction activities in a water body or the riparian zone: Select Yes or No from the drop down box. **If Yes, describe scope of activity:** Provide a brief description of the activity (ies) that will take place in the water body or the riparian zone.

Is a Clean Water Act 404 permit required: Select Yes or No from the drop down box.

Is a Clean Water Act 401 Water Quality Certification required: Select Yes or No from the drop down box.

SECTION VII – NOI PREPARER INFORMATION

Provide the name, mailing address, telephone number and eMail address of the person preparing the NOI.

SECTION VIII –Attachments

Attach a USGS topographic map indicating the location of the activity and the proposed discharge points.

SECTION IX – CERTIFICATION

Provide the name, mailing address, telephone number and eMail address of the person who is responsible for the activity.

Signature: Provide full name of the responsibility party. This will constitute a signature.

The NOI must be signed as follows:

Corporation: by a principal executive officer of at least the level of vice president.

Partnership or sole proprietorship: by a general partner or the proprietor respectively.





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

July 29, 2014

Matthew Bullock
KY 61 - Bullitt Co
8310 WESTPORT ROAD
LOUISVILLE, KY 402423042

Re: KYR10 Coverage Acknowledgment
KPDES No.: KYR10I654
KY 61 Reconstruction (Sections 1 & 2)
Permit Type: Construction
AI ID: 35022
Bullitt County, Kentucky

Dear Matthew Bullock:

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>.

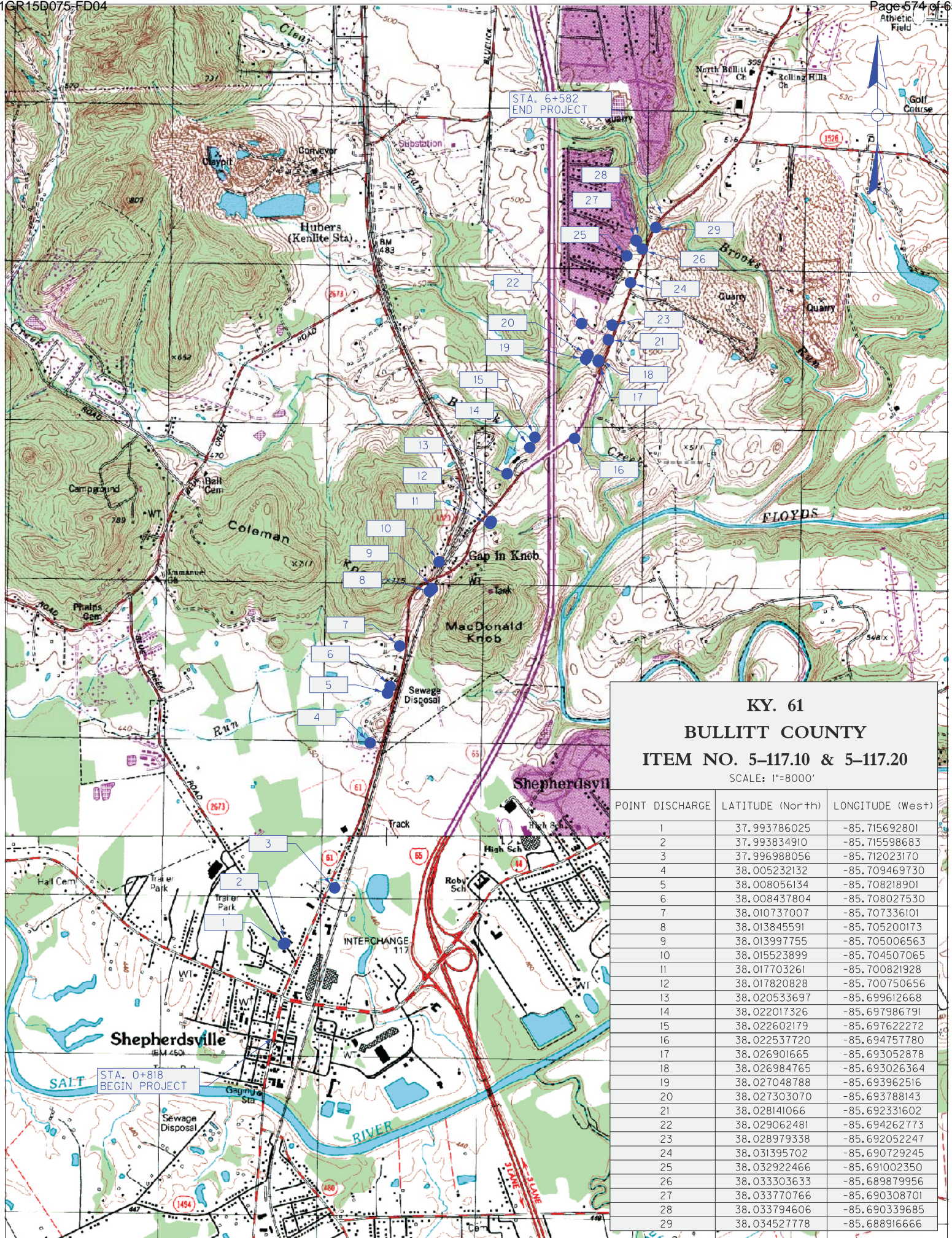
Any questions concerning the general permit and its requirements should be directed to me at (502) 564-3410.

Facility Site: 38.01222, -85.705833

Sincerely,

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

Shawn Hokanson
Surface Water Permits Branch
Division of Water



**KY. 61
BULLITT COUNTY
ITEM NO. 5-117.10 & 5-117.20**
SCALE: 1"=8000'

POINT DISCHARGE	LATITUDE (North)	LONGITUDE (West)
1	37.993786025	-85.715692801
2	37.993834910	-85.715598683
3	37.996988056	-85.712023170
4	38.005232132	-85.709469730
5	38.008056134	-85.708218901
6	38.008437804	-85.708027530
7	38.010737007	-85.707336101
8	38.013845591	-85.705200173
9	38.013997755	-85.705006563
10	38.015523899	-85.704507065
11	38.017703261	-85.700821928
12	38.017820828	-85.700750656
13	38.020533697	-85.699612668
14	38.022017326	-85.697986791
15	38.022602179	-85.697622272
16	38.022537720	-85.694757780
17	38.026901665	-85.693052878
18	38.026984765	-85.693026364
19	38.027048788	-85.693962516
20	38.027303070	-85.693788143
21	38.028141066	-85.692331602
22	38.029062481	-85.694262773
23	38.028979338	-85.692052247
24	38.031395702	-85.690729245
25	38.032922466	-85.691002350
26	38.033303633	-85.689879956
27	38.033770766	-85.690308701
28	38.033794606	-85.690339685
29	38.034527778	-85.688916666

SYP8161
16 JUL 2015

KENTUCKY TRANSPORTATION CABINET
COMMUNICATING ALL PROMISES (CAP)

<u>Item No.</u>	5 - 117.1			<u>Project Mgr.</u>
				KYTC\CHUCK.BERGE R
			<u>County</u> BULLITT	<u>Route</u> KY-61
<u>CAP #</u>	<u>Date of Promise</u>	<u>Promise made to:</u>	<u>Location of Promise</u>	
1	12-MAR-05	1	Trustees of Mount Zion Baptist Church of Shepherdsville	
<u>CAP Description</u>				
A) CONTRACTOR SHALL NOT LEAVE EQUIPMENT PARKED ON THE PROPERTY OR WORK AREAS OVERNIGHT.				
B) CONTRACTOR SHALL LIMIT CONSTRUCTION WORK DURING SERVICE HOURS (SUNDAYS) AND WEDNESDAY EVENINGS (AFTER 6).				
C) CONTRACTOR SHALL CLEAN AND DO THEIR BEST TO KEEP MUD AND DIRT FROM OUTSIDE OF THE EASEMENT AREAS.				
D) CONTRACTOR SHALL NOTIFY TRUSTEE, JIMMIE MASDEN AT CELL PHONE (502) 418-5159, A MINIMUM OF TWO WEEKS BEFORE CONSTRUCTION STARTS.				
2	12-MAR-05	Trustees of Mount Zion	Parcel 21	
		Baptist Church of Shepherdsville		
<u>CAP Description</u>				
VOID CAP #1				
3	12-MAR-05	Trustees of Mount Zion	Parcel 21	
		Baptist Church of Shepherdsville		
<u>CAP Description</u>				
A) CONTRACTOR SHALL NOT LEAVE EQUIPMENT PARKED ON THE PROPERTY OR WORK AREAS OVERNIGHT.				
B) CONTRACTOR SHALL LIMIT CONSTRUCTION WORK DURING SERVICE HOURS (SUNDAYS) AND WEDNESDAY EVENINGS (AFTER 6).				
C) CONTRACTOR SHALL CLEAN AND DO THEIR BEST TO KEEP MUD AND DIRT FROM OUTSIDE OF THE EASEMENT AREAS.				
D) CONTRACTOR SHALL NOTIFY TRUSTEE, JIMMIE MASDEN AT CELL PHONE (502) 418-5159, A MINIMUM OF TWO WEEKS BEFORE CONSTRUCTION STARTS.				
4	28-SEP-04	Linda Faye Barnes	Parcel 54	
<u>CAP Description</u>				
THE AREAS AFFECTED BY REMOVAL OF UNDERGROUND STORAGE TANKS SHALL BE PAVED WITH ASPHALT BY "CONSENT AND RELEASE."				
5	29-JAN-14	USPS	Parcel 81	
<u>CAP Description</u>				
A) UTILITY RELOCATIONS THAT INVOLVE ANY DISRUPTION OF PRIVATE SERVICE NEED TO BE COORDINATED WITH THE POST MASTER.				
B) STOP SIGNS AND DIRECTIONAL SIGNS AT THE POST OFFICE ENTRANCE SHALL BE RELOCATED APPROPRIATELY BY THE ROAD CONTRACTOR.				
6	01-AUG-14	Roy Gene Troutman	Parcel 87	
<u>CAP Description</u>				
THE LARGE TREE ON THE NORTH SIDE OF THE DRIVEWAY CLOSEST TO KY 61 SHALL BE REMOVED.				
7	02-JUN-14	Mr. and Mrs. Stottman	Parcel 106	
<u>CAP Description</u>				
TWO EXISTING FRENCH DRAIN PIPES RUN PERPENDICULAR TO KY 61 AND EXTEND INTO THE EASEMENT. IF DAMAGED, THESE PIPES SHALL BE REPAIRED AND/OR REPLACED BY THE ROAD CONTRACTOR.				
8	26-AUG-14	Gerald Mitchell	Parcel 197	
<u>CAP Description</u>				
THE FRONT PORCH SHALL NOT BE DISTURBED.				

SYP8161
16 JUL 2015

KENTUCKY TRANSPORTATION CABINET
COMMUNICATING ALL PROMISES (CAP)

Item No. 5 - 117.2 **Project Mgr.** CHUCK BERGER

County BULLITT **Route** KY-61

<u>CAP #</u>	<u>Date of Promise</u>	<u>Promise made to:</u>	<u>Location of Promise</u>
1	05-OCT-09	SP II, LLC	Parcels 102, 112, 119

CAP Description

ACCESS ROAD AND ENTRANCE TO BE BUILT BY OTHERS (NOT KYTC). THIS APPLIES ONLY TO ACCESS ROAD #1 STA. 4+000 - 4+124. THE ENTRANCE REFERS TO PARCEL 112 AT STATION 4+660.

2	11-SEP-14	SP II, LLC	Parcels 102, 112, 119
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CAP Description

VOID CAP #1. PLANS HAVE BEEN UPDATED TO REFLECT ALL OF THE RECENT DISCUSSIONS WITH THE PROPERTY OWNER.

TO: All Prequalified Contractors

FROM: Rachel Mills, P.E.
Director
Division of Construction Procurement

DATE: September 15, 2015

SUBJECT: Mandatory Pre-Bid Conference
Bullitt County
Contract ID
Item No. 5-117.10 and 5-117.20
KY 61 Widening from KY 44 to Brooks Run (Sections 1 & 2)
November 20, 2015 Letting

The Department of Highways will conduct a Mandatory Pre-Bid Conference for the subject project. The conference will be held October 13, 2015 at 1:00 p.m. prevailing time at Kentucky Department of Highways, District 5 Office – 8310 Westport Road, Louisville, KY 40242, in the main conference room.

Any company that is interested in bidding on the subject project or being part of a joint venture must be represented at the Pre-Bid Conference by at least **one person of sufficient authority to bind the company**. No individual can represent more than one company. At the conference a roster will be taken of the representatives present.

ONLY COMPANIES REPRESENTED AT THE CONFERENCE WILL BE ELIGIBLE TO HAVE THEIR BIDS OPENED AT THE DATE OF THE LETTING.

If you have any questions, please feel free to contact this office at 502-564-3500.

RM/lar

**5-117.10 and 117.20
SPECIAL NOTE FOR PRE-BID CONFERENCE**

The Department will conduct a Pre-Bid Conference of the subject project on **Tuesday, October 13, 2015 at 1:00 PM EDT at:**

**Kentucky Department of Highways
District 5
8310 Westport Road
Louisville, KY 40242
Phone: (502) 210-5400**

Any company that is interested in bidding on the subject project or being part of a joint venture must be represented at the conference by at least **one person of sufficient authority to bind the company**. No individual can represent more than one company. At the conference a roster will be taken of the representatives present. **Only companies represented at the conference will be eligible to have their bids opened at the date of letting.**

The purpose of the conference is to familiarize all prospective bidders with the contract requirements of the contract.

Department of Highways officials present at the conference will answer questions concerning the projects.

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 July 31, 2015 Letting**

Subsection:	102.15 Process Agent.
Revision:	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.
Subsection:	105.13 Claims Resolution Process.
Revision:	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.
Subsection:	108.03 Preconstruction Conference.
Revision:	Replace 8) Staking with the following: 8) Staking (designated by a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
Subsection:	109.07.02 Fuel.
Revision:	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. Crushed Sandstone Base (Cement Treated)
Subsection:	110.02 Demobilization.
Revision:	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;
Subsection:	112.03.12 Project Traffic Coordinator (PTC).
Revision:	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.
Subsection:	112.04.18 Diversions (By-Pass Detours).
Revision:	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.
Subsection:	201.03.01 Contractor Staking.
Revision:	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.

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Subsection:	201.04.01 Contractor Staking.
Revision:	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.
Subsection:	206.04.01 Embankment-in-Place.
Revision:	Replace the fourth paragraph with the following: The Department will not measure suitable excavation included in the original plans that is disposed of for payment and will consider it incidental to Embankment-in-Place.
Subsection:	208.02.01 Cement.
Revision:	Replace paragraph with the following: Select Type I or Type II cement conforming to Section 801. Use the same type cement throughout the work.
Subsection:	208.03.06 Curing and Protection.
Revision:	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.
Subsection:	208.03.06 Curing and Protection.
Revision:	Replace paragraph eight with the following: At no expense to the Department, repair any damage to the subgrade caused by freezing.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Revision:	Revise Seed Mix Type I 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)
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Number:	2)
Revision:	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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Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Number:	3)
Revision:	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.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	B) Procedures for Permanent Seeding.
Revision:	Delete the first sentence of the section.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	B) Procedures for Permanent Seeding.
Revision:	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.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Top Dressing.
Revision:	Change the title of part to D) Fertilizer.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Fertilizer.
Revision:	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.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Fertilizer.
Revision:	Delete the second paragraph.
Subsection:	212.04.04 Agricultural Limestone.
Revision:	Replace the entire section with the following: The Department will measure the quantity of agricultural limestone in tons.
Subsection:	212.04.05 Fertilizer.
Revision:	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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Subsection:	212.05 PAYMENT.												
Revision:	Delete the following item code:												
	<table border="1"> <thead> <tr> <th><u>Code</u></th> <th><u>Pay Item</u></th> <th><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											
Subsection:	212.05 PAYMENT.												
Revision:	Add the following pay items:												
	<table border="1"> <thead> <tr> <th><u>Code</u></th> <th><u>Pay Item</u></th> <th><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
<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											
Subsection:	213.03.02 Progress Requirements.												
Revision:	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 work are not coordinated in an acceptable manner within 7 calendar days after written notification.												
Subsection:	213.03.05 Temporary Control Measures.												
Part:	E) Temporary Seeding and Protection.												
Revision:	Delete the second sentence of the first paragraph.												
Subsection:	304.02.01 Physical Properties.												
Table:	Required Geogrid Properties												
Revision:	Replace all references to Test Method "GRI-GG2-87" with ASTM D 7737.												
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.												
Part:	B) Sampling.												
Revision:	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.												
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.												
Part:	D) Testing Responsibilities.												
Number:	3) VMA.												
Revision:	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.												
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.												
Part:	D) Testing Responsibilities.												
Number:	4) Density.												
Revision:	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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Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.
Part:	D) Testing Responsibilities.
Number:	5) Gradation.
Revision:	Delete the second paragraph.
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.
Part:	H) Unsatisfactory Work.
Number:	1) Based on Lab Data.
Revision:	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.
Subsection:	402.03.03 Verification.
Revision:	Replace the first paragraph with the following: 402.03.03 Mixture Verification. 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.
Subsection:	402.03.03 Verification.
Part:	A) Evaluation of Subplot(s) Verified by Department.
Revision:	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.
Subsection:	402.03.03 Verification.
Part:	B) Evaluation of Subplots Not Verified by Department.
Revision:	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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Subsection:	402.03.03 Verification.
Part:	B) Evaluation of Sublots Not Verified by Department.
Revision:	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.
Subsection:	402.03.03 Verification.
Part:	C) Test Data Patterns.
Revision:	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.
Subsection:	402.03 CONSTRUCTION.
Revision:	Add the following subsection: 402.03.04 Testing Equipment and Technician Verification. 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 ± 2.0 percent, the Department will investigate and resolve the discrepancy according to Subsection 402.03.05.
Subsection:	402.03.04 Dispute Resolution.
Revision:	Change the subsection number to 402.03.05.
Subsection:	402.05 PAYMENT.
Part:	Lot Pay Adjustment Schedule Compaction Option A Base and Binder Mixtures
Table:	AC
Revision:	Replace the Deviation from JMF(%) that corresponds to a Pay Value of 0.95 to ± 0.6 .
Subsection:	403.02.10 Material Transfer Vehicle (MTV).
Revision:	Replace the first sentence with the following: In addition to the equipment specified above, provide a MTV with the following minimum characteristics:
Subsection:	412.02.09 Material Transfer Vehicle (MTV).
Revision:	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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Subsection:	412.03.07 Placement and Compaction.
Revision:	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.
Subsection:	412.04 MEASUREMENT.
Revision:	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.
Subsection:	501.03.05 Weather Limitations and Protection.
Revision:	Replace the reference to Subsection 501.03.19 in Paragraph 5, with Subsection 501.03.20.
Subsection:	501.03.19 Surface Tolerances and Testing Surface.
Part:	B) Ride Quality.
Revision:	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.
Subsection:	603.03.06 Cofferdams.
Revision:	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.
Subsection:	605.03.04 Tack Welding.
Revision:	Insert the subsection and the following: 605.03.04 Tack Welding. The Department does not allow tack welding.
Subsection:	606.03.17 Special Requirements for Latex Concrete Overlays.
Part:	A) Existing Bridges and New Structures.
Number:	1) Prewetting and Grout-Bond Coat.
Revision:	Add the following sentence to the last paragraph: Do not apply a grout-bond coat on bridge decks prepared by hydrodemolition.
Subsection:	609.03 Construction.
Revision:	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.

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Subsection:	611.03.02 Precast Unit Construction.
Revision:	Replace the first sentence of the subsection with the following: Construct units according to ASTM C1577, 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) , and Section 605 with the following exceptions and additions:
Subsection:	613.03.01 Design.
Number:	2)
Revision:	Replace "AASHTO Standard Specifications for Highway Bridges" with "AASHTO LRFD Bridge Design Specifications"
Subsection:	615.06.02
Revision:	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 $\frac{3}{4}$ inch.
Subsection:	615.06.03 Placement of Reinforcement in Precast 3-Sided Units.
Revision:	Replace the reference of 6.6 in the section to 615.06.06.
Subsection:	615.06.04 Placement of Reinforcement for Precast Endwalls.
Revision:	Replace the reference of 6.7 in the section to 615.06.07.
Subsection:	615.06.06 Laps, Welds, and Spacing for Precast 3-Sided Units.
Revision:	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.
Subsection:	615.06.07 Laps, Welds, and Spacing for Precast Endwalls.
Revision:	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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Subsection:	615.08.01 Type of Test Specimen.
Revision:	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 ³ (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.
Subsection:	615.08.02 Compression Testing.
Revision:	Delete the second sentence.
Subsection:	615.08.04 Acceptability of Core Tests.
Revision:	Delete the entire subsection.
Subsection:	615.12 Inspection.
Revision:	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.
Subsection:	701.04.16 Deduction for Pipe Deflection.
Revision:	Insert the following at the end of the paragraph: The section length is determined by the length of the pipe between joints where the failure occurred.
Subsection:	716.02.02 Paint.
Revision:	Replace sentence with the following: Conform to Section 821.
Subsection:	716.03 CONSTRUCTION.
Revision:	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,
Subsection:	716.03.02 Lighting Standard Installation.
Revision:	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.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	A) Conventional Installation.
Revision:	Replace the third sentence with the following: Orient the transformer base so the door is positioned on the side away from on-coming traffic.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	A) Conventional Installation.
Number:	1) Breakaway Installation and Requirements.
Revision:	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.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	B) High Mast Installation
Revision:	Replace the first sentence with the following: Install each high mast pole as noted on plans.

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Subsection:	716.03.02 Lighting Standard Installation.																																																
Part:	B) High Mast Installation																																																
Number:	2) Concrete Base Installation																																																
Revision:	Modification of Chart and succeeding paragraphs within this section:																																																
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="8">Drilled Shaft Depth Data</th> </tr> <tr> <th colspan="2">Level Ground</th> <th colspan="2">3:1 Ground Slope</th> <th colspan="2">2:1 Ground Slope</th> <th colspan="2">1.5:1 Ground Slope ⁽²⁾</th> </tr> <tr> <th>Soil</th> <th>Rock</th> <th>Soil</th> <th>Rock</th> <th>Soil</th> <th>Rock</th> <th>Soil</th> <th>Rock</th> </tr> </thead> <tbody> <tr> <td>17 ft</td> <td>7 ft</td> <td>19 ft</td> <td>7 ft</td> <td>20 ft</td> <td>7 ft</td> <td>(1)</td> <td>7 ft</td> </tr> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4">Steel Requirements</th> </tr> <tr> <th colspan="2">Vertical Bars</th> <th colspan="2">Ties or Spiral</th> </tr> <tr> <th>Size</th> <th>Total</th> <th>Size</th> <th>Spacing or Pitch</th> </tr> </thead> <tbody> <tr> <td>#10</td> <td>16</td> <td>#4</td> <td>12 inch</td> </tr> </tbody> </table> <p>(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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	Drilled Shaft Depth Data								Level Ground		3:1 Ground Slope		2:1 Ground Slope		1.5:1 Ground Slope ⁽²⁾		Soil	Rock	Soil	Rock	Soil	Rock	Soil	Rock	17 ft	7 ft	19 ft	7 ft	20 ft	7 ft	(1)	7 ft	Steel Requirements				Vertical Bars		Ties or Spiral		Size	Total	Size	Spacing or Pitch	#10	16	#4	12 inch
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Subsection:	716.03.03 Trenching.																																																
Part:	A) Trenching of Conduit for Highmast Ducted Cables.																																																
Revision:	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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Subsection:	716.03.03 Trenching.
Part:	B) Trenching of Conduit for Non-Highmast Cables.
Revision:	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.
Subsection:	716.03.10 Junction Boxes.
Revision:	Replace subsection title with the following: Electrical Junction Box.
Subsection:	716.04.07 Pole with Secondary Control Equipment.
Revision:	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.
Subsection:	716.04.08 Lighting Control Equipment.
Revision:	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.
Subsection:	716.04.09 Luminaire.
Revision:	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
Subsection:	716.04.10 Fused Connector Kits.
Revision:	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
Subsection:	716.04.13 Junction Box.
Revision:	Replace the subsection title with the following: Electrical Junction Box Type Various.
Subsection:	716.04.13 Junction Box.
Part:	A) Junction Electrical.
Revision:	Rename A) Junction Electrical to the following: A) Electrical Junction Box.
Subsection:	716.04.14 Trenching and Backfilling.
Revision:	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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Subsection:	716.04.18 Remove Lighting.															
Revision:	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.															
Subsection:	716.04.20 Bore and Jack Conduit.															
Revision:	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.															
Subsection:	716.05 PAYMENT.															
Revision:	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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20392NS835	Electrical Junction Box Type C	Each														
Subsection:	723.02.02 Paint.															
Revision:	Replace sentence with the following: Conform to Section 821.															
Subsection:	723.03 CONSTRUCTION.															
Revision:	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,															
Subsection:	723.03.02 Poles and Bases Installation.															
Revision:	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.															
Subsection:	723.03.02 Poles and Bases Installation.															
Part:	A) Steel Strain and Mastarm Poles Installation															
Revision:	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:															
Subsection:	723.03.02 Poles and Bases Installation.															
Part:	B) Pedestal or Pedestal Post Installation.															
Revision:	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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Subsection:	723.03.03 Trenching.
Part:	A) Under Roadway.
Revision:	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.
Subsection:	723.03.11 Wiring Installation.
Revision:	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.
Subsection:	723.03.12 Loop Installation.
Revision:	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.
Subsection:	723.04.02 Junction Box.
Revision:	Replace subsection title with the following: Electrical Junction Box Type Various.
Subsection:	723.04.03 Trenching and Backfilling.
Revision:	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.
Subsection:	723.04.10 Signal Pedestal.
Revision:	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.
Subsection:	723.04.15 Loop Saw Slot and Fill.
Revision:	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.
Subsection:	723.04.16 Pedestrian Detector.
Revision:	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.
Subsection:	723.04.18 Signal Controller- Type 170.
Revision:	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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Subsection:	723.04.20 Install Signal Controller - Type 170.
Revision:	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.
Subsection:	723.04.22 Remove Signal Equipment.
Revision:	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.
Subsection:	723.04.28 Install Pedestrian Detector Audible.
Revision:	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.
Subsection:	723.04.29 Audible Pedestrian Detector.
Revision:	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.
Subsection:	723.04.30 Bore and Jack Conduit.
Revision:	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.
Subsection:	723.04.31 Install Pedestrian Detector.
Revision:	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.
Subsection:	723.04.32 Install Mast Arm Pole.
Revision:	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.
Subsection:	723.04.33 Pedestal Post.
Revision:	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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Subsection:	723.04.36 Traffic Signal Pole Base.															
Revision:	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.															
Subsection:	723.04.37 Install Signal Pedestal.															
Revision:	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.															
Subsection:	723.04.38 Install Pedestal Post.															
Revision:	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.															
Subsection:	723.05 PAYMENT.															
Revision:	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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Subsection:	804.01.02 Crushed Sand.															
Revision:	Delete last sentence of the section.															
Subsection:	804.01.06 Slag.															
Revision:	Add subsection and following sentence. Provide blast furnace slag sand where permitted. The Department will allow steel slag sand only in asphalt surface applications.															
Subsection:	804.04 Asphalt Mixtures.															
Revision:	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.															
Subsection:	806.03.01 General Requirements.															
Revision:	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 _{NR} (nonrecoverable creep compliance) between 0.1 and 0.5, when tested according to AASHTO TP 70.															

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Subsection:	806.03.01 General Requirements.						
Table:	PG Binder Requirements and Price Adjustment Schedule						
Revision:	Replace the Elastic Recovery, % ⁽³⁾ (AASHTO T301) and all corresponding values in the table with the following:						
	<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⁽¹⁾</u>
	MSCR recovery, % ⁽³⁾ (AASHTO TP 70)	60 Min.	≥58	56	55	54	<53
Subsection:	806.03.01 General Requirements.						
Table:	PG Binder Requirements and Price Adjustment Schedule						
Superscript:	(3)						
Revision:	Replace ⁽³⁾ with the following: Perform testing at 64°C.						
Subsection:	813.04 Gray Iron Castings.						
Revision:	Replace the reference to "AASHTO M105" with "ASTM A48".						
Subsection:	813.09.02 High Strength Steel Bolts, Nuts, and Washers.						
Number:	A) Bolts.						
Revision:	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.						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Third paragraph, replace the reference to "AWPA C14" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	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.						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Fourth paragraph, replace the reference to "AWPA C2" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Delete the second sentence of the fourth paragraph.						
Subsection:	814.05.02 Composite Plastic.						
Revision:	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.						
Subsection:	816.07.02 Wood Posts and Braces.						
Revision:	First paragraph, replace the reference to "AWPA C5" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	816.07.02 Wood Posts and Braces.						
Revision:	Delete the second sentence of the first paragraph.						
Subsection:	818.07 Preservative Treatment.						
Revision:	First paragraph, replace all references to "AWPA C14" with "AWPA U1, Section A".						

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Subsection:	834.14 Lighting Poles.
Revision:	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).
Subsection	834.14.03 High Mast Poles.
Revision:	Remove the second and fourth sentence from the first paragraph.
Subsection	834.14.03 High Mast Poles.
Revision:	Replace the third paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.
Subsection:	834.14.03 High Mast Poles.
Revision:	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. 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-gauge 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).
Subsection:	834.16 ANCHOR BOLTS.
Revision:	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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Subsection:	834.17.01 Conventional.
Revision:	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.
Subsection:	834.21.01 Waterproof Enclosures.
Revision:	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.
Subsection:	835.07 Traffic Poles.
Revision:	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.
Subsection:	835.07 Traffic Poles.
Revision:	*Replace the first sentence of the fourth paragraph with the following: Ensure transverse plates have a thickness ≥ 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.
Subsection:	835.07 Traffic Poles.
Revision:	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.
Subsection:	835.07 Traffic Poles.
Revision:	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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Subsection:	835.07 Traffic Poles.									
Revision:	*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.									
Subsection:	835.07.01 Steel Strain Poles.									
Revision:	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.									
Subsection:	835.07.01 Steel Strain Poles.									
Revision:	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.									
Subsection:	835.07.02 Mast Arm Poles.									
Revision:	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.									
Subsection:	835.07.02 Mast Arm Poles.									
Revision:	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.									
Subsection:	835.07.03 Anchor Bolts.									
Revision:	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).									
Subsection:	835.16.05 Optical Units.									
Revision:	Replace the 3rd paragraph with the following: The list of certified products can be found on the following website: http://www.intertek.com .									
Subsection:	835.19.01 Pedestrian Detector Body.									
Revision:	Replace the first sentence with the following: Provide a four holed pole mounted aluminum rectangular housing that is compatible with the pedestrian detector.									
Subsection:	843.01.01 Geotextile Fabric.									
Table:	TYPE I FABRIC GEOTEXTILES FOR SLOPE PROTECTION AND CHANNEL LINING									
Revision:	Add the following to the chart:									
	<table border="1"> <thead> <tr> <th><u>Property</u></th> <th><u>Minimum Value⁽¹⁾</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⁽¹⁾</u>	<u>Test Method</u>	CBR Puncture (lbs)	494	ASTM D6241	Permittivity (1/s)	0.7	ASTM D4491
<u>Property</u>	<u>Minimum Value⁽¹⁾</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 July 31, 2015 Letting**

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

SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

This Special Note will apply when indicated on the plans or in the proposal.

1.0 DESCRIPTION. Furnish, install, operate, and maintain variable message signs at the locations shown on the plans or designated by the Engineer. Remove and retain possession of variable message signs when they are no longer needed on the project.

2.0 MATERIALS.

2.1 General. Use LED Variable Message Signs Class I, II, or III, as appropriate, from the Department's List of Approved Materials.

Unclassified signs may be submitted for approval by the Engineer. The Engineer may require a daytime and nighttime demonstration. The Engineer will make a final decision within 30 days after all required information is received.

2.2 Sign and Controls. All signs must:

- 1) Provide 3-line messages with each line being 8 characters long and at least 18 inches tall. Each character comprises 35 pixels.
- 2) Provide at least 40 preprogrammed messages available for use at any time. Provide for quick and easy change of the displayed message; editing of the message; and additions of new messages.
- 3) Provide a controller consisting of:
 - a) Keyboard or keypad.
 - b) Readout that mimics the actual sign display. (When LCD or LCD type readout is used, include backlighting and heating or otherwise arrange for viewing in cold temperatures.)
 - c) Non-volatile memory or suitable memory with battery backup for storing pre-programmed messages.
 - d) Logic circuitry to control the sequence of messages and flash rate.
- 4) Provide a serial interface that is capable of supporting complete remote control ability through land line and cellular telephone operation. Include communication software capable of immediately updating the message, providing complete sign status, and allowing message library queries and updates.
- 5) Allow a single person easily to raise the sign to a satisfactory height above the pavement during use, and lower the sign during travel.
- 6) Be Highway Orange on all exterior surfaces of the trailer, supports, and controller cabinet.
- 7) Provide operation in ambient temperatures from -30 to + 120 degrees Fahrenheit during snow, rain and other inclement weather.
- 8) Provide the driver board as part of a module. All modules are interchangeable, and have plug and socket arrangements for disconnection and reconnection. Printed circuit boards associated with driver boards have a conformable coating to protect against moisture.
- 9) Provide a sign case sealed against rain, snow, dust, insects, etc. The lens is UV stabilized clear plastic (polycarbonate, acrylic, or other approved material) angled to prevent glare.
- 10) Provide a flat black UV protected coating on the sign hardware, character PCB, and appropriate lens areas.
- 11) Provide a photocell control to provide automatic dimming.

- 12) Allow an on-off flashing sequence at an adjustable rate.
- 13) Provide a sight to aim the message.
- 14) Provide a LED display color of approximately 590 nm amber.
- 15) Provide a controller that is password protected.
- 16) Provide a security device that prevents unauthorized individuals from accessing the controller.
- 17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

/KEEP/RIGHT/=>=>=>/	/MIN/SPEED/**MPH/
/KEEP/LEFT/<=<=</	/ICY/BRIDGE/AHEAD/ /ONE
/LOOSE/GRAVEL/AHEAD/	LANE/BRIDGE/AHEAD/
/RD WORK/NEXT/**MILES/	/ROUGH/ROAD/AHEAD/
/TWO WAY/TRAFFIC/AHEAD/	/MERGING/TRAFFIC/AHEAD/
/PAINT/CREW/AHEAD/	/NEXT/**/MILES/
/REDUCE/SPEED/**MPH/	/HEAVY/TRAFFIC/AHEAD/
/BRIDGE/WORK/**0 FT/	/SPEED/LIMIT/**MPH/
/MAX/SPEED/**MPH/	/BUMP/AHEAD/
/SURVEY/PARTY/AHEAD/	/TWO/WAY/TRAFFIC/

*Insert numerals as directed by the Engineer.
Add other messages during the project when required by the Engineer.

2.3 Power.

- 1) Design solar panels to yield 10 percent or greater additional charge than sign consumption. Provide direct wiring for operation of the sign or arrow board from an external power source to provide energy backup for 21 days without sunlight and an on-board system charger with the ability to recharge completely discharged batteries in 24 hours.

3.0 CONSTRUCTION. Furnish and operate the variable message signs as designated on the plans or by the Engineer. Ensure the bottom of the message panel is a minimum of 7 feet above the roadway in urban areas and 5 feet above in rural areas when operating. Use Class I, II, or III signs on roads with a speed limit less than 55 mph. Use Class I or II signs on roads with speed limits 55 mph or greater.

Maintain the sign in proper working order, including repair of any damage done by others, until completion of the project. When the sign becomes inoperative, immediately repair or replace the sign. Repetitive problems with the same unit will be cause for rejection and replacement.

Use only project related messages and messages directed by the Engineer, unnecessary messages lessen the impact of the sign. Ensure the message is displayed in either one or 2 phases with each phase having no more than 3 lines of text. When no message is needed, but it is necessary to know if the sign is operable, flash only a pixel.

When the sign is not needed, move it outside the clear zone or where the Engineer directs. Variable Message Signs are the property of the Contractor and shall be removed from the project when no longer needed. The Department will not assume ownership of these signs.

4.0 MEASUREMENT. The final quantity of Variable Message Sign will be

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the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

5.0 PAYMENT. The Department will pay for the Variable Message Signs at the unit price each. The Department will not pay for signs replaced due to damage or rejection. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to, operate, move, repair, and maintain or replace the variable message signs. The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

SPECIAL NOTE FOR ROCK BLASTING

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. This work consists of fracturing rock and constructing stable final rock cut faces using presplit blasting and production blasting techniques.

2.0 MATERIALS. Deliver, store, and use explosives according to the manufacturer's recommendations and applicable laws. Do not use explosives outside their recommended use date. Verify date of manufacture and provide copies of the technical data sheets (TDS) and material safety data sheets (MSDS) to the Engineer. Explosives and initiating devices include, but are not necessarily limited to, dynamite and other high explosives, slurries, water gels, emulsions, blasting agents, initiating explosives, detonators, blasting caps, and detonating cord.

3.0 CONSTRUCTION. Furnish copies or other proof of all-applicable permits and licenses. Comply with Federal, State, and local regulations on the purchase, transportation, storage, and use of explosive material. Regulations include but are not limited to the following:

- 1) KRS 351.310 through 351.9901.
- 2) 805 KAR 4:005 through 4:165
- 3) Applicable rules and regulations issued by the Office of Mine Safety and Licensing.
- 4) Safety and health. OSHA, 29 CFR Part 1926, Subpart U.
- 5) Storage, security, and accountability. Bureau of Alcohol, Tobacco, and Firearms (BATF), 27 CFR Part 181.
- 6) Shipment. DOT, 49 CFR Parts 171-179, 390-397.

3.1 Blaster-in-Charge. Designate in writing a blaster-in-charge and any proposed alternates for the position. Submit documentation showing the blaster-in-charge, and alternates, have a valid Kentucky blaster's license. Ensure the blaster-in-charge or approved alternate is present at all times during blasting operations.

3.2 Blasting Plans. Blasting plans and reports are for quality control and record keeping purposes. Blasting reports are to be signed by the blaster-in-charge or the alternate blaster-in-charge. The general review and acceptance of blasting plans does not relieve the Contractor of the responsibility whatsoever for conformance to regulations or for obtaining the required results. All blasting plans shall be submitted to the Engineer. The Engineer will be responsible for submitting the plan to the Central Office Division of Construction and the Division of Mine Reclamation and Enforcement, Explosives and Blasting Branch at the following address: 2 Hudson Hollow, Frankfort, Kentucky, 40601.

- A) General Blasting Plan.** Submit a general blasting plan for acceptance at least 15 working days before drilling operations begin. Include, as a minimum, the following safety and procedural details:

- 1) Working procedures and safety precautions for storing, transporting, handling, detonating explosives. Include direction on pre and post blast audible procedures, methods of addressing misfires, and methods of addressing inclement weather, including lightning.
- 2) Proposed product selection for both dry and wet holes. Furnish Manufacturer's TDS and MSDS for all explosives, primers, initiators, and other blasting devices.
- 3) Proposed initiation and delay methods.
- 4) Proposed format for providing all the required information for the site specific blasting shot reports.

B) Preblast Meeting. Prior to drilling operations, conduct a preblast meeting to discuss safety and traffic control issues and any site specific conditions that will need to be addressed. Ensure, at a minimum, that the Engineer or lead inspector, Superintendent, blaster-in-charge, and all personnel involved in the blasting operation are present. Site specific conditions include blast techniques; communication procedures; contingency plans and equipment for dealing with errant blast material. The conditions of the General Blasting plan will be discussed at this meeting. Record all revisions and additions made to the blasting plan and obtain written concurrence by the blaster-in-charge. Provide a copy of the signed blast plan to the Engineer along with the sign in sheet from the preblast meeting.

3.3 Preblast Condition Survey and Vibration Monitoring and Control. Before blasting, arrange for a preblast condition survey of nearby buildings, structures, or utilities, within 500 feet of the blast or that could be at risk from blasting damage. Provide the Engineer a listing of all properties surveyed and any owners denying entry or failing to respond. Notify the Engineer and occupants of buildings at risk at least 24 hours before blasting.

Limit ground vibrations and airblast to levels that will not exceed limits of 805 KAR 4:005 through 4:165. More restrictive levels may be specified in the Contract.

Size all blast designs based on vibration, distance to nearest building or utility, blast site geometry, atmospheric conditions and other factors. Ground vibrations are to be controlled according to the blasting standards and scaled distance formulas in 805 KAR 4:020 or by the use of seismographs as allowed in 805 KAR 4:030. The Department will require seismographs at the nearest allowable location to the protected site when blasting occurs within 500 feet of buildings, structures, or utilities.

3.4 Blasting. Drill and blast at the designated slope lines according to the blasting plan. Perform presplitting to obtain smooth faces in the rock and shale formations. Perform the presplitting before blasting and excavating the interior portion of the specified cross section at any location. The Department may allow blasting for fall benches and haul roads prior to presplitting when blasting is a sufficient distance from the final slope and results are satisfactory to the Engineer. Use the types of explosives and blasting accessories necessary to obtain the required results.

Free blast holes of obstructions for their entire depth. Place charges without caving the blast hole walls. Stem the upper portion of all blast holes with dry sand or other granular material passing the 3/8-inch sieve. Dry drill cuttings are acceptable for stemming when blasts are more than 800 feet from the nearest dwelling.

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Stop traffic during blasting operations when blasting near any road and ensure traffic does not pass through the Danger Zone. The blaster-in-charge will define the Danger Zone prior to each blast. Ensure traffic is stopped outside the Danger Zone, and in no case within 800 feet of the blast location.

Following a blast, stop work in the entire blast area, and check for misfires before allowing worker to return to excavate the rock.

Remove or stabilize all cut face rock that is loose, hanging, or potentially dangerous. Leave minor irregularities or surface variations in place if they do not create a hazard. Drill the next lift only after the cleanup work and stabilization work is complete.

When blasting operations cause fracturing of the final rock face, repair or stabilize it in an approved manner at no cost to the Department.

Halt blasting operations in areas where any of the following occur:

- 1) Slopes are unstable;
- 2) Slopes exceed tolerances or overhangs are created;
- 3) Backslope damage occurs;
- 4) Safety of the public is jeopardized;
- 5) Property or natural features are endangered;
- 6) Fly rock is generated; or
- 7) Excessive ground or airblast vibrations occur in an area where damage to buildings, structures, or utilities is possible.
- 8) The Engineer determines that materials have become unsuitable for blasting

Blasting operations may continue at a reasonable distance from the problem area or in areas where the problems do not exist. Make the necessary modifications to the blasting operations and perform a test blast to demonstrate resolution of the problem.

A) Drill Logs. Maintain a layout drawing designating hole numbers with corresponding drill logs and provide a copy of this information to the blaster prior to loading the hole. Ensure the individual hole logs completed by the driller(s) show their name; date drilled; total depth drilled; and depths and descriptions of significant conditions encountered during drilling that may affect loading such as water, voids, changes in rock type.

B) Presplitting. Conduct presplitting operations in conformance with Subsection 204.03.04 of the Standard Specifications for Road and Bridge Construction.

3.5 Shot Report. Maintain all shot reports on site for review by the Department. Within one day after a blast, complete a shot report according to the record keeping requirements of 805 KAR 4:050. Include all results from airblast and seismograph monitoring.

3.6 Unacceptable Blasting. When unacceptable blasting occurs, the Department will halt all blasting operations. Blasting will not resume until the Department completes its investigation and all concerns are addressed. A blast is unacceptable when it results in fragmentation beyond the final rock face, fly rock, excessive vibration or airblast, overbreak, damage to the final rock face or overhang. Assume the cost for all resulting damages to private and public property and hold the Department harmless.

11D

When an errant blast or fly rock causes damage to or blocks a road or conveyance adjacent to the roadway, remove all debris from the roadway as quickly as practicable and perform any necessary repairs. Additionally, when specified in the Contract, the Department will apply a penalty.

Report all blasting accidents to the Division of Mine Reclamation and Enforcement, Explosives and Blasting Branch at 502-564-2340.

4.0 MEASUREMENT AND PAYMENT. The Department will not measure this work for payment and will consider all items contained in this note to be incidental to either Roadway Excavation or Embankment-in-Place, as applicable. However, if the Engineer directs in writing slope changes, then the Department will pay for the second presplitting operation as Extra Work.

The Department will measure for payment material lying outside the typical section due to seams, broken formations, or earth pockets, including any earth overburden removed with this material, only when the work is performed under authorized adjustments.

The Department will not measure for payment any extra material excavated because of the drill holes being offset outside the designated slope lines.

The Department will not measure for payment any material necessary to be removed due to the inefficient or faulty blasting practices.

June 15, 2012

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 ¹	Type 1	Type 2	Type 3	Type 4	Test Method
Minimum tensile Strength lbs/ft	125	150	175	3000 by 1500	ASTM D6818 ²
UV stability (minimum % tensile retention)	80	80	80	90	ASTM D4355 ³ (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 ² Channel applications	6.0 ⁴	8.0 ⁴	10.0 ⁴	12.0 ⁴	ASTM D6459 ASTM D6460-07

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

²Minimum Average Roll Values for tensile strength of sample material machine direction.

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

⁴Maximum 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

SPECIAL NOTE FOR BARCODE LABEL ON PERMANENT SIGNS

1.0 DESCRIPTION. Install barcode label on sheeting signs. Section references herein are to the Department’s 2012 Standard Specifications for Road and Bridge Construction.

2.0 MATERIALS. The Department will provide the Contractor with a 2 inch x 1 inch foil barcode label for each permanent sheeting sign. A unique number will be assigned to each barcode label.

The Contractor shall contact the Operations and Pavement Management Branch in the Division of Maintenance at (502) 564-4556 to obtain the barcode labels.

3.0 CONSTRUCTION. Apply foil barcode label in the lower right quadrant of the sign back. Signs where the bottom edge is not parallel to the ground, the lowest corner of the sign shall serve as the location to place the barcode label. The barcode label shall be placed no less than one-inch and no more than three inches from any edge of the sign. The barcode must be placed so that the sign post does not cover the barcode label.

Barcodes shall be applied in an indoor setting with a minimum air temperature of 50°F or higher. Prior to application of the barcode label, the back of the sign must be clean and free of dust, oil, etc. If the sign is not clean, an alcohol swab shall be used to clean the area. The area must be allowed to dry prior to placement of the barcode label.

Data for each sign shall include the barcode number, MUTCD reference number, sheeting manufacturer, sheeting type, manufacture date, color of primary reflective surface, installation date, latitude and longitude using the North American Datum of 1983 (NAD83) or the State Plane Coordinates using an x and y ordinate of the installed location.

Data should be provided electronically on the TC 71-229 Sign Details Information and TC 71-230 Sign Assembly Information forms. The Contractor may choose to present the data in a different format provided that the information submitted to the Department is equivalent to the information required on the Department TC forms. The forms must be submitted in electronic format regardless of which type of form is used. The Department will not accept PDF or handwritten forms. These completed forms must be submitted to the Department prior to final inspection of the signs. The Department will not issue formal acceptance for the project until the TC 71-229 and TC-230 electronic forms are completed for all signs and sign assemblies on the project.

4.0 MEASUREMENT. The Department will measure all work required for the installation of the barcode label and all work associated with completion and submission of the sign inventory data (TC 71-229 and TC 71-230).

The installation of the permanent sign will be measured in accordance to Section 715.

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

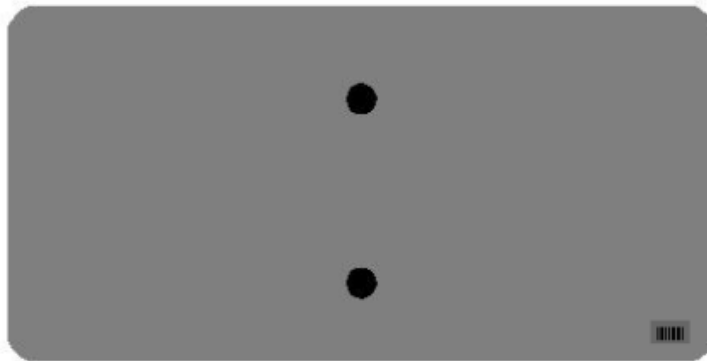
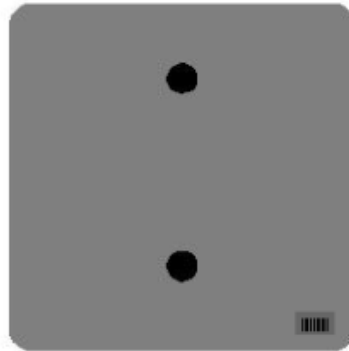
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24631EC	Barcode Sign Inventory	Each

The Department will not make payment for this item until all barcodes are installed and sign inventory is complete on every permanent sign installed on the project. The Department will make payment for installation of the permanent sign in accordance to Section 715. The Department will consider payment as full compensation for all work required under this special note.

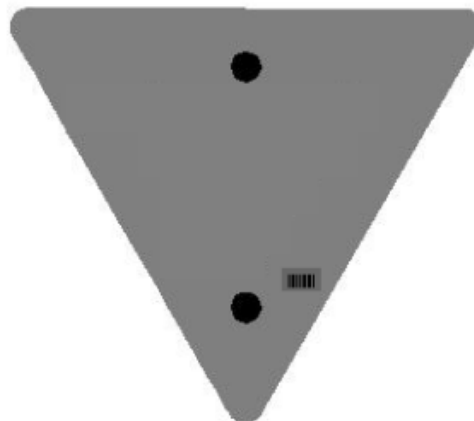
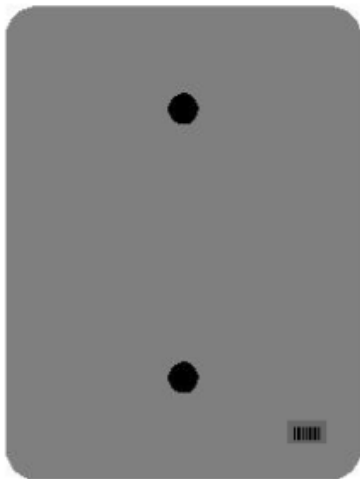
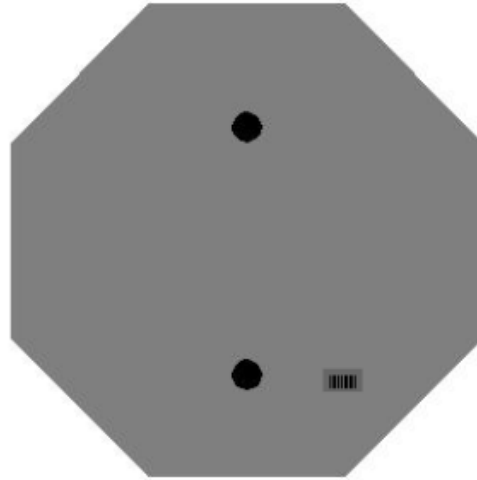
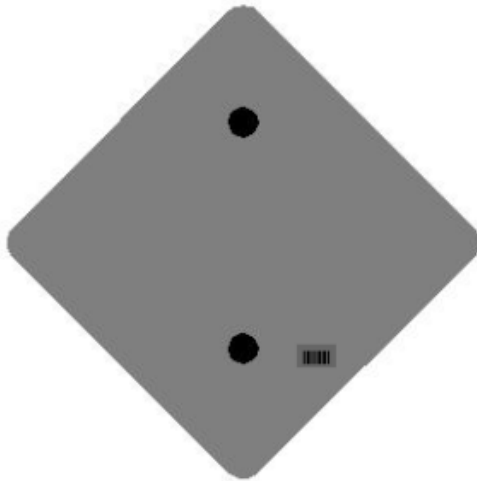
One Sign Post



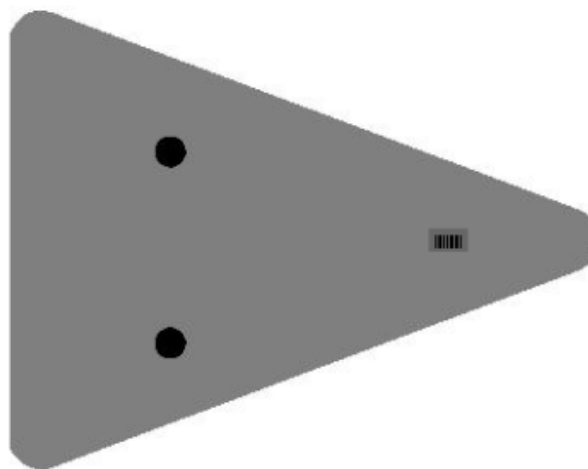
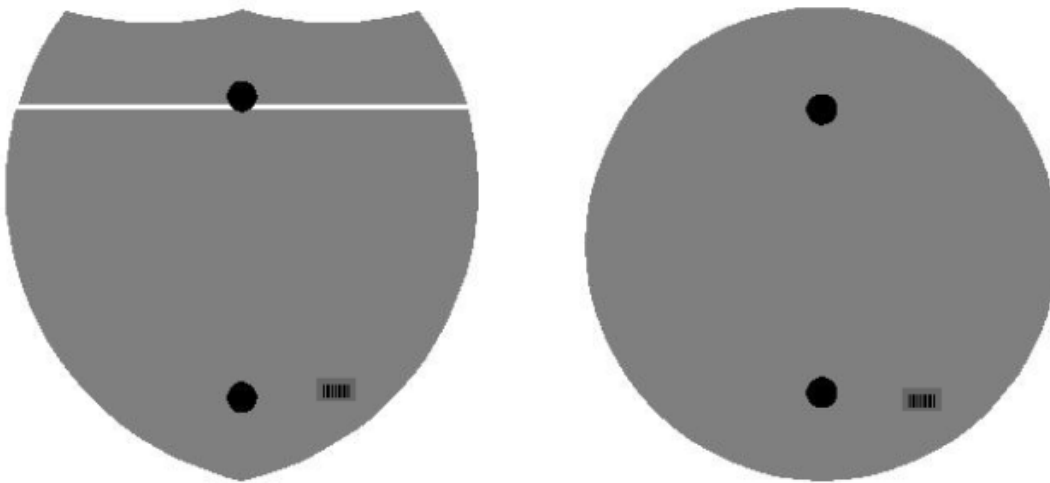
↑
2" Wide Post



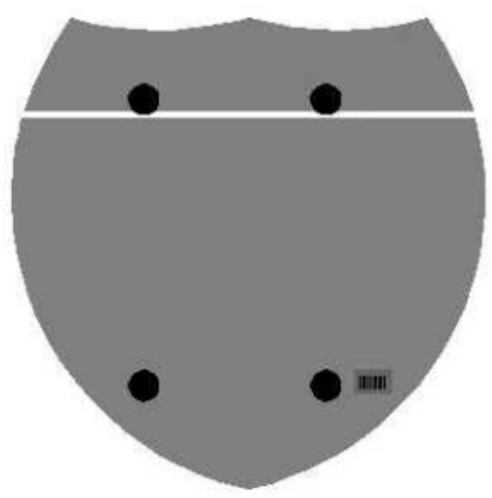
One Sign Post



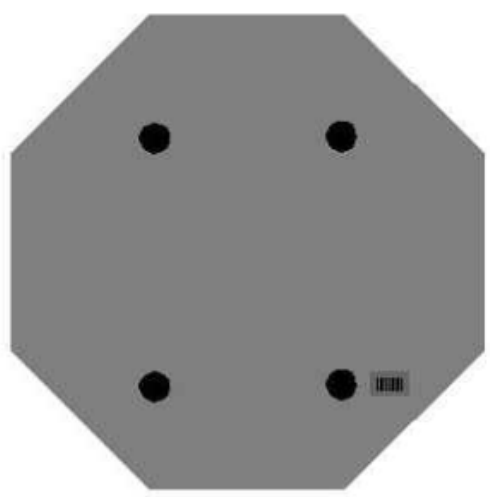
One Sign Post



Double Sign Post



Interstate
Shield

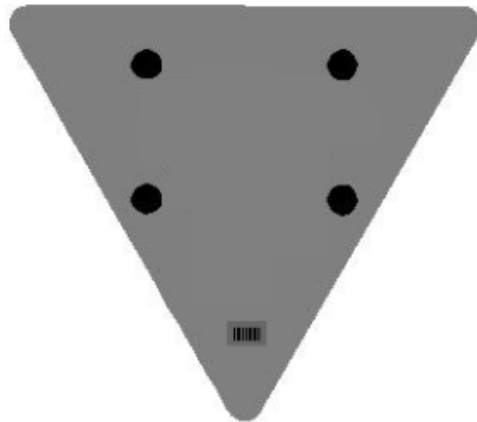


48" Stop

2 Post Signs



↑
2" Wide Post



SPECIAL PROVISION FOR EMBANKMENT AT BRIDGE END BENT STRUCTURES

This Special Provision will apply when indicated on the plans or in the proposal. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. Construct a soil, granular, or rock embankment with granular or cohesive pile core and place structure granular backfill, as the Plans require. Construct the embankment according to the requirements of this Special Provision, the Plans, Standard Drawing RGX 100 and 105, and the 2012 Standard Specifications.

2.0 MATERIALS.

2.1 Granular Embankment. Conform to Subsection 805.10. When Granular Embankment materials are erodible or unstable according to Subsection 805.03.04, use the Special Construction Methods found in 3.2 of the Special Provision.

2.2 Rock Embankment. Provide durable rock from roadway excavation that consists principally of Unweathered Limestone, Durable Shale (SDI equal to or greater than 95 according to KM 64-513), or Durable Sandstone.

2.3 Granular Pile Core. Select a gradation of durable rock to facilitate pile driving that conforms to Subsection 805.11. If granular pile core material hinders pile driving operations, take appropriate means necessary to reach the required pile tip elevation, at no expense to the Department.

2.4 Cohesive Pile Core. Conform to Section 206 of the Standard Specifications and use soil with at least 50 percent passing a No. 4 sieve having a minimum Plasticity Index (PI) of 10. In addition, keep the cohesive pile core free of boulders, larger than 6 inches in any dimension, or any other obstructions, which would interfere with drilling operations. If cohesive pile core material interferes with drilling operations, take appropriate means necessary to maintain excavation stability, at no expense to the Department.

2.5 Structure Granular Backfill. Conform to Subsection 805.11

2.6 Geotextile Fabric. Conform to Type I or Type IV in Section 214 and 843 as required in the plans.

3.0 CONSTRUCTION.

3.1 General. Construct roadway embankments at end bents according to Section 206 and in accordance with the Special Provision, the Plans, and Standard Drawings for the full embankment section. In some instances, granular or rock embankment will be required for embankment construction for stability purposes, but this special provision does not prevent the use of soil when appropriate. Refer to the plans for specific details regarding material requirements for embankment construction.

Place and compact granular or cohesive pile core, soil, granular or rock embankment, and structure granular backfill according to the applicable density requirements for the project. When constructing granular or rock embankments, use granular pile core for driven pile foundations and use cohesive pile core for pre-drilled pile or drilled shaft foundations. Place geotextile fabric, Type IV between cohesive pile core and structure

granular backfill and granular or rock embankment.

When granular or rock embankment is required for embankment construction, conform to the general requirements of Subsection 206.03.02 B). In addition, place the material in no greater than 2-foot lifts and compact with a vibrating smooth wheel roller capable of producing a minimum centrifugal force of 15 tons. Apply these requirements to the full width of the embankment for a distance of half the embankment height or 50 feet, whichever is greater, as shown on Standard Drawing RGX-105.

When using granular pile core, install 8-inch perforated underdrain pipe at or near the elevation of the original ground in the approximate locations depicted on the standard drawing, and as the Engineer directs, to ensure positive drainage of the embankment. Wrap the perforated pipe with a fabric of a type recommended by the pipe manufacturer.

After constructing the embankment, excavate for the end bent cap, drive piling or install shafts, place the mortar bed, construct the end bent, and complete the embankment to finish grade according to the construction sequence shown on the Plans or Standard Drawings and as specified hereinafter.

Certain projects may require widening of existing embankments and the removal of substructures. Construct embankment according to the plans. Substructure removal shall be completed according to the plans and Section 203. Excavation may be required at the existing embankment in order to place the structure granular backfill as shown in the Standard Drawings.

After piles are driven or shafts installed (see design drawings), slope the bottom of the excavation towards the ends of the trench as noted on the plans for drainage. Using a separate pour, place concrete mortar, or any class concrete, to provide a base for forming and placing the cap. Place side forms for the end bent after the mortar has set sufficiently to support workmen and forms without being disturbed.

Install 4-inch perforated pipe in accordance with the plans and Standard Drawings. In the event slope protection extends above the elevation of the perforated pipe, extend the pipe through the slope protection.

After placing the end bent cap and removing adjacent forms, fill the excavation with structure granular backfill material to the level of the berm prior to placing beams for the bridge. For soil embankments, place Type IV geotextile fabric between embankment material and structure granular backfill. After completing the end bent backwall, or after completing the span end wall, place the structure granular backfill to subgrade elevation. If the original excavation is enlarged, fill the entire volume with compacted structure granular backfill at no expense to the Department. Do not place backfill before removing adjacent form work. Place structure granular backfill material in trench ditches at the ends of the excavation. Place Geotextile Fabric, Type IV over the surface of structure granular backfill prior to placing aggregate base course.

Tamp the backfill with hand tampers, pneumatic tampers, or other means the Engineer approves. Thoroughly compact the backfill under the overhanging portions of the structure to ensure that the backfill is in intimate contact with the sides of the structure.

Do not apply seeding, sodding, or other vegetation to the exposed granular embankment.

3.2 Special Construction Methods. Erodible or unstable materials may erode even when protected by riprap or channel lining; use the special construction method described below when using these materials.

Use fine aggregates or friable sandstone granular embankment at "dry land" structures only. Do not use them at stream crossings or locations subject to flood waters.

For erodible or unstable materials having 50 percent or more passing the No. 4 sieve, protect with geotextile fabric. Extend the fabric from the original ground to the top of the slope over the entire area of the embankment slopes on each side of, and in front of, the

end bent. Cover the fabric with at least 12 inches of non-erodible material.

For erodible or unstable materials having less than 50 percent passing a No. 4 sieve, cover with at least 12 inches of non-erodible material.

Where erodible or unstable granular embankment will be protected by riprap or channel lining, place geotextile fabric between the embankment and the specified slope protection.

4.0 MEASUREMENT.

4.1 Granular Embankment. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure for payment any Granular Embankment that is not called for in the plans.

The Department will not measure for payment any special construction caused by using erodible or unstable materials and will consider it incidental to the Granular Embankment regardless of whether the erodible or unstable material was specified or permitted.

4.2 Rock Embankment. The Department will not measure for payment any rock embankment and will consider it incidental to roadway excavation or embankment in place, as applicable. Rock embankments will be constructed using granular embankment on projects where there is no available rock present within the excavation limits of the project.

4.3 Granular Pile Core. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure for payment furnishing and placing 8-inch perforated underdrain pipe and will consider it incidental to the Granular pile core. The Department will not measure for payment any granular pile core that is necessary because the contractor elects to use granular or rock embankment when it is not specified in the plans.

4.4 Cohesive Pile Core. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204.

4.5 Structure Granular Backfill. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure any additional material required for backfill outside the limits shown on the Plans and Standard Drawings for payment and will consider it incidental to the work.

The Department will not measure structure excavation at the end bent or an existing embankment for payment and will consider it incidental to Structure Granular Backfill.

The Department will not measure for payment the 4-inch perforated underdrain pipe and will consider it incidental to the Structure Granular Backfill.

4.6 Geotextile Fabric. The Department will measure the quantities as specified in Section 214. The Department will not measure the quantity of fabric used for separating granular or rock embankment and cohesive pile core and will consider it incidental to cohesive pile core.

4.7 End Bent. The Department will measure the quantities according to the

Contract. The Department will not measure furnishing and placing the 2-inch mortar or concrete bed for payment and will consider it incidental to the end bent construction.

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>
02223	Granular Embankment	Cubic Yards
20209EP69	Granular Pile Core	Cubic Yards
20210EP69	Cohesive Pile Core	Cubic Yards
02231	Structure Granular Backfill	Cubic Yards
02596, 02599	Geotextile Fabric, Type	See Section 214

The Department will consider payment as full compensation for all work required in this provision.

June 15, 2012

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

**TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS**

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

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

I. APPLICATION

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

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

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

II. NONDISCRIMINATION OF EMPLOYEES

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

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

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

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

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

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

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

III. PAYMENT OF PREDETERMINED MINIMUM WAGES

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

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

IV. STATEMENTS AND PAYROLLS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Revised 2-16-95

EXECUTIVE BRANCH CODE OF ETHICS

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

KRS 11A.040 (6) provides:

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

KRS 11A.040 (8) states:

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

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

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

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

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

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

Kentucky Equal Employment Opportunity Act of 1978

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

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

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

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

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

General Decision Number: KY150100 09/25/2015 KY100

Superseded General Decision Number: KY20140100

State: Kentucky

Construction Type: Highway

Counties: Anderson, Bath, Bourbon, Boyd, Boyle, Bracken, Breckinridge, Bullitt, Carroll, Carter, Clark, Elliott, Fayette, Fleming, Franklin, Gallatin, Grant, Grayson, Greenup, Hardin, Harrison, Henry, Jefferson, Jessamine, Larue, Lewis, Madison, Marion, Mason, Meade, Mercer, Montgomery, Nelson, Nicholas, Oldham, Owen, Robertson, Rowan, Scott, Shelby, Spencer, Trimble, Washington and Woodford 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).

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of \$10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015
1	01/23/2015
2	01/30/2015
3	02/20/2015
4	05/01/2015
5	05/22/2015
6	06/05/2015
7	06/12/2015
8	06/19/2015
9	08/21/2015
10	09/04/2015
11	09/11/2015
12	09/25/2015

BRIN0004-003 06/01/2011

BRECKENRIDGE COUNTY

	Rates	Fringes
BRICKLAYER.....	\$ 24.11	10.07

BRKY0001-005 06/01/2015

BULLITT, CARROLL, GRAYSON, HARDIN, HENRY, JEFFERSON, LARUE,
MARION, MEADE, NELSON, OLDHAM, SHELBY, SPENCER, & TRIMBLE
COUNTIES:

	Rates	Fringes
BRICKLAYER.....	\$ 25.96	10.64

BRKY0002-006 06/01/2011

BRACKEN, GALLATIN, GRANT, MASON & ROBERTSON COUNTIES:

	Rates	Fringes
BRICKLAYER.....	\$ 26.57	10.26

BRKY0007-004 06/01/2014

BOYD, CARTER, ELLIOT, FLEMING, GREENUP, LEWIS & ROWAN COUNTIES:

	Rates	Fringes
BRICKLAYER.....	\$ 30.57	17.94

BRKY0017-004 06/01/2009

ANDERSON, BATH, BOURBON, BOYLE, CLARK, FAYETTE, FRANKLIN,
HARRISON, JESSAMINE, MADISON, MERCER, MONTGOMERY, NICHOLAS,
OWEN, SCOTT, WASHINGTON & WOODFORD COUNTIES:

	Rates	Fringes
BRICKLAYER.....	\$ 24.11	9.97

CARP0064-001 05/01/2015

	Rates	Fringes
CARPENTER.....	\$ 27.50	16.06
Diver.....	\$ 41.63	16.06
PILEDRIVERMAN.....	\$ 27.75	16.06

ELEC0212-008 06/01/2015

BRACKEN, GALLATIN and GRANT COUNTIES

	Rates	Fringes
ELECTRICIAN.....	\$ 27.03	17.02

ELEC0212-014 12/01/2014

BRACKEN, GALLATIN & GRANT COUNTIES:

	Rates	Fringes
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Sound & Communication
Technician.....\$ 22.75 10.08

ELEC0317-012 05/28/2014

BOYD, CARTER, ELLIOT & ROWAN COUNTIES:

	Rates	Fringes
ELECTRICIAN		
Cable Splicer.....	\$ 32.68	18.13
Electrician.....	\$ 32.62	21.45

ELEC0369-007 05/27/2015

ANDERSON, BATH, BOURBON, BOYLE, BRECKINRIDGE, BULLITT, CARROLL,
CLARK, FAYETTE, FRAONKLIN, GRAYSON, HARDIN, HARRISON, HENRY,
JEFFERSON, JESSAMINE, LARUE, MADISON, MARION, MEADE, MERCER,
MONTGOMERY, NELSON, NICHOLAS, OLDHAM, OWEN, ROBERTSON, SCOTT,
SHELBY, SPENCER, TRIMBLE, WASHINGTON, & WOODFORD COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 30.01	15.65

ELEC0575-002 06/02/2014

FLEMING, GREENUP, LEWIS & MASON COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 31.70	14.21

ENGI0181-018 07/01/2015

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 29.95	14.40
GROUP 2.....	\$ 27.26	14.40
GROUP 3.....	\$ 27.68	14.40
GROUP 4.....	\$ 26.96	14.40

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; Gurrries;
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 leads equals or exceeds 150 ft. - \$1.00 over 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.

IRON0044-009 06/01/2015

BRACKEN, GALLATIN, GRANT, HARRISON, ROBERTSON,
BOURBON (Northern third, including Townships of Jackson, Millersburg, Ruddel Mills & Shawhan);
CARROLL (Eastern third, including the Township of Ghent);
FLEMING (Western part, excluding Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksridge, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford);
MASON (Western two-thirds, including Townships of Dover, Lewisburg, Mays Lick, Maysville, Minerva, Moranburg, Murphysville, Ripley, Sardis, Shannon, South Ripley &

Washington);
 NICHOLAS (Townships of Barefoot, Barterville, Carlisle, Ellisville, Headquarters, Henryville, Morningglory, Myers & Oakland Mills);
 OWEN (Townships of Beechwood, Bromley, Fairbanks, Holbrook, Jonesville, Long Ridge, Lusby's Mill, New, New Columbus, New Liberty, Owenton, Poplar Grove, Rockdale, Sanders, Teresita & Wheatley);
 SCOTT (Northern two-thirds, including Townships of Biddle, Davis, Delaplain, Elmville, Longlick, Muddy Ford, Oxford, Rogers Gap, Sadieville, Skinnersburg & Stonewall)

	Rates	Fringes
IRONWORKER		
Fence Erector.....	\$ 23.76	19.15
Structural.....	\$ 26.40	19.15

 IRON0070-006 06/01/2015

ANDERSON, BOYLE, BRECKINRIDGE, BULLITT, FAYETTE, FRANKLIN, GRAYSON, HARDIN, HENRY, JEFFERSON, JESSAMINE, LARUE, MADISON, MARION, MEADE, MERCER, NELSON, OLDHAM, SHELBY, SPENCER, TRIMBLE, WASHINGTON & WOODFORD
 BOURBON (Southern two-thirds, including Townships of Austerlity, Centerville, Clintonville, Elizabeth, Hutchison, Littlerock, North Middletown & Paris);
 CARROLL (Western two-thirds, including Townships of Carrollton, Easterday, English, Locust, Louis, Prestonville & Worthville);
 CLARK (Western two-thirds, including Townships of Becknerville, Flanagan, Ford, Pine Grove, Winchester & Wyandotte);
 OWEN (Eastern eighth, including Townships of Glenmary, Gratz, Monterey, Perry Park & Tacketts Mill);
 SCOTT (Southern third, including Townships of Georgetown, Great Crossing, Newtown, Stampling Ground & Woodlake);

	Rates	Fringes
IRONWORKER.....	\$ 27.56	20.30

 IRON0372-006 06/15/2015

BRACKEN, GALLATIN, GRANT, HARRISON and ROBERTSON
 BOURBON (Northern third, including Townships of Jackson, Millersburg, Ruddel Mills & Shawhan);
 CARROLL (Eastern third, including the Township of Ghent);
 FLEMING (Western part, Excluding Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksridge, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford);
 MASON (Western two-thirds, including Townships of Dover, Lewisburg, Mays Lick, Maysville, Minerva, Moranburg, Murphysville, Ripley, Sardis, Shannon, South Ripley & Washington);
 NICHOLAS (Townships of Barefoot, Barterville, Carlisle, Ellisville, Headquarters, Henryville, Morningglory, Myers &

Oakland Mills);
OWEN (Townships of Beechwood, Bromley, Fairbanks, Holbrook, Jonesville, Long Ridge, Lusby's Mill, New, New Columbus, New Liberty, Owenton, Poplar Grove, Rockdale, Sanders, Teresita & Wheatley);
SCOTT (Northern two-thirds, including Townships of Biddle, Davis, Delaplain, Elmville, Longlick, Muddy Ford, Oxford, Rogers Gap, Sadieville, Skinnersburg & Stonewall) COUNTIES

	Rates	Fringes
IRONWORKER, REINFORCING.....	\$ 27.00	19.00

IRON0769-007 06/01/2015		

BATH, BOYD, CARTER, ELLIOTT, GREENUP, LEWIS, MONTGOMERY & ROWAN CLARK (Eastern third, including townships of Bloomingdale, Hunt, Indian Fields, Kiddville, Loglick, Rightangele & Thomson);
FLEMING (Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksridge, Plummers Landing, Plummers Mill, Poplar Plains, Ringos Mills, Tilton & Wallingford);
MASON (Eastern third, including Townships of Helena, Marshall, Orangeburg, Plumville & Springdale);
NICHOLAS (Eastern eighth, including the Township of Moorefield Sprout)

	Rates	Fringes
IRONWORKER		
ZONE 1.....	\$ 31.33	22.39
ZONE 2.....	\$ 31.73	22.39
ZONE 3.....	\$ 33.33	22.39
ZONE 1 - Up to 10 mile radius of Union Hall, Ashland, Ky., 1643 Greenup Ave.		
ZONE 2 - 10 to 50 mile radius of Union Hall, Ashland, Ky., 1643 Greenup Ave.		
ZONE 3 - 50 mile radius & over of Union Hall, Ashland, Ky., 1643 Greenup Ave.		

LABO0189-003 07/01/2014

BATH, BOURBON, BOYD, BOYLE, BRACKEN, CARTER, CLARK, ELLIOTT, FAYETTE, FLEMING, FRANKLIN, GALLATIN, GRANT, GREENUP, HARRISON, JESSAMINE, LEWIS, MADISON, MASON, MERCER, MONTGOMERY, NICHOLAS, OWEN, ROBERTSON, ROWAN, SCOTT, & WOOLFORD COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 21.80	11.96
GROUP 2.....	\$ 22.05	11.96

GROUP 3.....	\$ 22.10	11.96
GROUP 4.....	\$ 22.70	11.96

LABORERS 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; 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

LABO0189-008 07/01/2014

ANDERSON, BULLITT, CARROLL, HARDIN, HENRY, JEFFERSON, LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY, SPENCER, TRIMBLE & WASHINGTON COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 22.71	11.05
GROUP 2.....	\$ 22.96	11.05
GROUP 3.....	\$ 23.01	11.05
GROUP 4.....	\$ 23.61	11.05

LABORERS 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; 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

LABO0189-009 07/01/2014

BRECKINRIDGE & GRAYSON 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

LABORERS 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; 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

PAIN0012-005 06/11/2005

BATH, BOURBON, BOYLE, CLARK, FAYETTE, FLEMING, FRANKLIN,
HARRISON, JESSAMINE, MADISON, MERCER, MONTGOMERY, NICHOLAS,
ROBERTSON, SCOTT & WOODFORD COUNTIES:

	Rates	Fringes
PAINTER		
Bridge/Equipment Tender and/or Containment Builder..	\$ 18.90	5.90
Brush & Roller.....	\$ 21.30	5.90
Elevated Tanks; Steeplejack Work; Bridge & Lead Abatement.....	\$ 22.30	5.90
Sandblasting & Waterblasting.....	\$ 22.05	5.90
Spray.....	\$ 21.80	5.90

PAIN0012-017 05/01/2015

BRACKEN, GALLATIN, GRANT, MASON & OWEN COUNTIES:

	Rates	Fringes
PAINTER (Heavy & Highway		

Bridges - Guardrails -
Lightpoles - Striping)

Bridge Equipment Tender and Containment Builder.....	\$ 20.73	9.06
Brush & Roller.....	\$ 23.39	9.06
Elevated Tanks; Steeplejack Work; Bridge & Lead Abatement.....	\$ 24.39	9.06
Sandblasting & Water Blasting.....	\$ 24.14	9.06
Spray.....	\$ 23.89	9.06

PAIN0118-004 06/01/2014

ANDERSON, BRECKINRIDGE, BULLITT, CARROLL, GRAYSON, HARDIN,
HENRY, JEFFERSON, LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY,
SPENCER, TRIMBLE & WASHINGTON COUNTIES:

	Rates	Fringes
PAINTER		
Brush & Roller.....	\$ 18.50	11.97
Spray, Sandblast, Power Tools, Waterblast & Steam Cleaning.....	\$ 19.50	11.97

PAIN1072-003 12/01/2014

BOYD, CARTER, ELLIOTT, GREENUP, LEWIS and ROWAN COUNTIES

	Rates	Fringes
Painters:		
Bridges; Locks; Dams; Tension Towers & Energized Substations.....	\$ 31.83	15.30
Power Generating Facilities.....	\$ 28.59	15.30

* PLUM0248-003 06/01/2015

BOYD, CARTER, ELLIOTT, GREENUP, LEWIS & ROWAN COUNTIES:

	Rates	Fringes
Plumber and Steamfitter.....	\$ 34.00	19.04

PLUM0392-007 06/01/2014

BRACKEN, CARROLL (Eastern Half), GALLATIN, GRANT, MASON, OWEN &
ROBERTSON COUNTIES:

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 29.80	17.79

PLUM0502-003 08/01/2013

BRECKINRIDGE, BULLITT, CARROLL (Western Half), FRANKLIN

(Western three-fourths), GRAYSON, HARDIN, HENRY, JEFFERSON,
LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY, SPENCER, TRIMBLE &
WASHINGTON COUNTIES

	Rates	Fringes
PLUMBER.....	\$ 32.00	17.17

SUKY2010-160 10/08/2001		

	Rates	Fringes
Truck drivers:		
GROUP 1.....	\$ 16.57	7.34
GROUP 2.....	\$ 16.68	7.34
GROUP 3.....	\$ 16.86	7.34
GROUP 4.....	\$ 16.96	7.34

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 - Mobile Batch Truck Tender

GROUP 2 - Greaser; Tire Changer; & Mechanic Tender

GROUP 3 - Single Axle Dump; Flatbed; Semi-trailer or Pole
Trailer when used to pull building materials and equipment;
Tandem Axle Dump; Distributor; Mixer; & Truck Mechanic

GROUP 4 - Euclid & Other Heavy Earthmoving Equipment &
Lowboy; Articulator Cat; 5-Axle Vehicle; Winch & A-Frame
when used in transporting materials; Ross Carrier; Forklift
when used to transport building materials; & Pavement
Breaker

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

=====
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)).

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 a union rate (current union negotiated rate for local),
a survey rate (weighted average rate) or a union average rate
(weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 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. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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.
=====

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-15-III- HWY dated July 20, 2015.

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.

Director
Division of Construction Procurement
Frankfort, Kentucky 40622
502-564-3500

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

151265

Page 1 of 10

Report Date 10/8/15

Section: 0001 - PAVING - ALTERNATE 1 - ASPHALT

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE	93,428.00	TON		\$	
0020	00013		LIME STABILIZED ROADBED	102,918.00	SQYD		\$	
0030	00014		LIME	1,947.00	TON		\$	
0040	00018		DRAINAGE BLANKET-TYPE II-ASPH	18,204.00	TON		\$	
0050	00100		ASPHALT SEAL AGGREGATE	328.00	TON		\$	
0060	00103		ASPHALT SEAL COAT	40.00	TON		\$	
0070	00212		CL2 ASPH BASE 1.00D PG64-22	13,150.00	TON		\$	
0080	00214		CL3 ASPH BASE 1.00D PG64-22	66,269.00	TON		\$	
0090	00301		CL2 ASPH SURF 0.38D PG64-22	4,616.00	TON		\$	
0100	00336		CL3 ASPH SURF 0.38A PG76-22	6,002.00	TON		\$	
0110	00358		ASPHALT CURING SEAL	104.00	TON		\$	
0120	00388		CL3 ASPH SURF 0.38B PG64-22	2,002.00	TON		\$	
0130	02702		SAND FOR BLOTTER	257.00	TON		\$	
0140	10203ND		PAVEMENT ADJUSTMENT (ASPHALT, 5-117.10)	1.00	LS	455,953.00	\$	\$455,953.00
0150	10203ND		PAVEMENT ADJUSTMENT (ASPHALT, 5-117.20)	1.00	LS	311,645.00	\$	\$311,645.00

Section: 0002 - PAVING - ALTERNATE 2 - CONCRETE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0160	00003		CRUSHED STONE BASE	79,386.00	TON		\$	
0170	00013		LIME STABILIZED ROADBED	102,918.00	SQYD		\$	
0180	00014		LIME	1,947.00	TON		\$	
0190	00018		DRAINAGE BLANKET-TYPE II-ASPH	16,542.00	TON		\$	
0200	00100		ASPHALT SEAL AGGREGATE	328.00	TON		\$	
0210	00103		ASPHALT SEAL COAT	40.00	TON		\$	
0220	00212		CL2 ASPH BASE 1.00D PG64-22	13,150.00	TON		\$	
0230	00214		CL3 ASPH BASE 1.00D PG64-22	1,500.00	TON		\$	
0240	00301		CL2 ASPH SURF 0.38D PG64-22	4,506.00	TON		\$	
0250	00336		CL3 ASPH SURF 0.38A PG76-22	650.00	TON		\$	
0260	00358		ASPHALT CURING SEAL	104.00	TON		\$	
0270	02073		JPC PAVEMENT-9 IN	113,177.00	SQYD		\$	
0280	02075		JPC PAVEMENT-6 IN	29,801.00	SQYD		\$	
0290	02702		SAND FOR BLOTTER	257.00	TON		\$	
0300	10203ND		PAVEMENT ADJUSTMENT (CONCRETE, 5-117.20)	1.00	LS	196,277.00	\$	\$196,277.00
0310	10203ND		PAVEMENT ADJUSTMENT (CONCRETE, 5-117.10)	1.00	LS	287,165.00	\$	\$287,165.00

Section: 0003 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0320	00078		CRUSHED AGGREGATE SIZE NO 2	28.60	TON		\$	
0330	01000		PERFORATED PIPE-4 IN	26,326.50	LF		\$	
0340	01010		NON-PERFORATED PIPE-4 IN	425.50	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0350	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM (5-117.20)	1.00	LS		\$	
0360	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM (5-117.10)	1.00	LS		\$	
0370	01020		PERF PIPE HEADWALL TY 1-4 IN	5.00	EACH		\$	
0380	01024		PERF PIPE HEADWALL TY 2-4 IN	1.00	EACH		\$	
0390	01028		PERF PIPE HEADWALL TY 3-4 IN	1.00	EACH		\$	
0400	01032		PERF PIPE HEADWALL TY 4-4 IN	13.00	EACH		\$	
0410	01310		REMOVE PIPE	2,664.00	LF		\$	
0420	01584		CAP DROP BOX INLET	1.00	EACH		\$	
0430	01706		REMOVE CATCH BASIN	27.00	EACH		\$	
0440	01740		CORED HOLE DRAINAGE BOX CON-4 IN	148.00	EACH		\$	
0450	01786		FILL AND CAP MANHOLE	6.00	EACH		\$	
0460	01787		REMOVE MANHOLE	5.00	EACH		\$	
0470	01792		ADJUST MANHOLE	13.00	EACH		\$	
0480	01810		STANDARD CURB AND GUTTER	7,871.00	LF		\$	
0490	01811		STANDARD CURB AND GUTTER MOD	5,409.00	LF		\$	
0500	01845		ISLAND INTEGRAL CURB	270.50	LF		\$	
0510	01875		STANDARD HEADER CURB	1,105.00	LF		\$	
0520	01897		ASPHALT WEDGE CURB	55.00	LF		\$	
0530	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	139.00	EACH		\$	
0540	01983		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL YELLOW	36.00	EACH		\$	
0550	01984		DELINEATOR FOR BARRIER - WHITE	48.00	EACH		\$	
0560	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	26.00	EACH		\$	
0570	01990		DELINEATOR FOR BARRIER WALL-B/W	5.00	EACH		\$	
0580	02003		RELOCATE TEMP CONC BARRIER	11,985.00	LF		\$	
0590	02014		BARRICADE-TYPE III	48.00	EACH		\$	
0600	02091		REMOVE PAVEMENT	1,715.10	SQYD		\$	
0610	02101		CEM CONC ENT PAVEMENT-8 IN	2,270.00	SQYD		\$	
0620	02159		TEMP DITCH	11,836.00	LF		\$	
0630	02160		CLEAN TEMP DITCH	5,918.00	LF		\$	
0640	02200		ROADWAY EXCAVATION	350,939.00	CUYD		\$	
0650	02223		GRANULAR EMBANKMENT	12,130.00	CUYD		\$	
0660	02242		WATER (FOR DUST CONTROL)	10.10	MGAL		\$	
0670	02262		FENCE-WOVEN WIRE TYPE 1	15,470.00	LF		\$	
0680	02351		GUARDRAIL-STEEL W BEAM-S FACE	10,156.50	LF		\$	
0690	02352		GUARDRAIL-STEEL W BEAM-D FACE	825.00	LF		\$	
0700	02360		GUARDRAIL TERMINAL SECTION NO 1	11.00	EACH		\$	
0710	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A	12.00	EACH		\$	
0720	02365		CRASH CUSHION TYPE IX-A	6.00	EACH		\$	
0730	02367		GUARDRAIL END TREATMENT TYPE 1	12.00	EACH		\$	
0740	02369		GUARDRAIL END TREATMENT TYPE 2A	22.00	EACH		\$	
0750	02381		REMOVE GUARDRAIL	3,735.40	LF		\$	
0760	02383		REMOVE & RESET GUARDRAIL	523.00	LF		\$	
0770	02387		GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	11.00	EACH		\$	
0780	02391		GUARDRAIL END TREATMENT TYPE 4A	1.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0790	02397		TEMP GUARDRAIL	226.50	LF		\$	
0800	02429		RIGHT-OF-WAY MONUMENT TYPE 1	119.00	EACH		\$	
0810	02430		RIGHT-OF-WAY MONUMENT TYPE 1A	11.00	EACH		\$	
0820	02432		WITNESS POST	33.00	EACH		\$	
0830	02483		CHANNEL LINING CLASS II	5,411.00	TON		\$	
0840	02484		CHANNEL LINING CLASS III	5,380.00	TON		\$	
0850	02545		CLEARING AND GRUBBING (5-117.20 - APPROXIMATELY 56.745 ACRES)	1.00	LS		\$	
0860	02545		CLEARING AND GRUBBING (5-117.10: APPROXIMATELY 41.521 ACRES)	1.00	LS		\$	
0870	02555		CONCRETE-CLASS B	327.00	CUYD		\$	
0880	02562		TEMPORARY SIGNS	2,691.00	SQFT		\$	
0890	02585		EDGE KEY	264.20	LF		\$	
0900	02596		FABRIC-GEOTEXTILE TYPE I	13,854.00	SQYD		\$	
0910	02599		FABRIC-GEOTEXTILE TYPE IV	270,907.00	SQYD		\$	
0920	02625		REMOVE HEADWALL	17.00	EACH		\$	
0930	02650		MAINTAIN & CONTROL TRAFFIC (5-117.20)	1.00	LS		\$	
0940	02650		MAINTAIN & CONTROL TRAFFIC (5-117.10)	1.00	LS		\$	
0950	02651		DIVERSIONS (BY-PASS DETOURS) (5-117.20 - KY 61 CONNECTOR)	1.00	LS		\$	
0960	02651		DIVERSIONS (BY-PASS DETOURS) (5-117.20 - BECNEL LANE, STA. 0+152.999 @ MAINLINE 5+834.523)	1.00	LS		\$	
0970	02651		DIVERSIONS (BY-PASS DETOURS) (5-117.20 - HILLBROOK DRIVE, STA. 5+000.000 @ MAINLINE 6+170.000)	1.00	LS		\$	
0980	02651		DIVERSIONS (BY-PASS DETOURS) (5-117.10 - A: STA. 3+305.000, MAINLINE KY 61)	1.00	LS		\$	
0990	02651		DIVERSIONS (BY-PASS DETOURS) (5-117.10 - B: STA. 0+000.000, MAINLINE KY 61)	1.00	LS		\$	
1000	02651		DIVERSIONS (BY-PASS DETOURS) (5-117.10 - CRR DIVERSION, STA. 4+947.527, CORAL RIDGE ROAD)	1.00	LS		\$	
1010	02651		DIVERSIONS (BY-PASS DETOURS) (5-117.10 - NS DIVERSION STA. 0+000.000, NORTH SIDE AVENUE)	1.00	LS		\$	
1020	02651		DIVERSIONS (BY-PASS DETOURS) (5-117.10 - POINTE DIVERSION STA. 0+000.000, POINTE BOULEVARD)	1.00	LS		\$	
1030	02671		PORTABLE CHANGEABLE MESSAGE SIGN	6.00	EACH		\$	
1040	02676		MOBILIZATION FOR MILL & TEXT (5-117.10)	1.00	LS		\$	
1050	02677		ASPHALT PAVE MILLING & TEXTURING	442.00	TON		\$	
1060	02690		SAFELoading	227.00	CUYD		\$	
1070	02696		SHOULDER RUMBLE STRIPS-SAWED	34,933.00	LF		\$	
1080	02701		TEMP SILT FENCE	11,836.00	LF		\$	
1090	02703		SILT TRAP TYPE A	81.00	EACH		\$	
1100	02704		SILT TRAP TYPE B	81.00	EACH		\$	
1110	02705		SILT TRAP TYPE C	81.00	EACH		\$	
1120	02706		CLEAN SILT TRAP TYPE A	162.00	EACH		\$	
1130	02707		CLEAN SILT TRAP TYPE B	162.00	EACH		\$	

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1140	02708		CLEAN SILT TRAP TYPE C	162.00	EACH		\$	
1150	02720		SIDEWALK-4 IN CONCRETE	6,786.00	SQYD		\$	
1160	02726		STAKING (5-117.20)	1.00	LS		\$	
1170	02726		STAKING (5-117.10)	1.00	LS		\$	
1180	02731		REMOVE STRUCTURE (5-117.10 - CSX BRIDGE)	1.00	LS		\$	
1190	02731		REMOVE STRUCTURE (5-117.10 - CULVERT)	1.00	LS		\$	
1200	02775		ARROW PANEL	4.00	EACH		\$	
1210	02898		RELOCATE CRASH CUSHION	58.00	EACH		\$	
1220	03171		CONCRETE BARRIER WALL TYPE 9T	2,897.00	LF		\$	
1230	03225		TUBULAR MARKERS	198.00	EACH		\$	
1240	05950		EROSION CONTROL BLANKET	4,298.00	SQYD		\$	
1250	05952		TEMP MULCH	321,873.00	SQYD		\$	
1260	05953		TEMP SEEDING AND PROTECTION	241,384.00	SQYD		\$	
1270	05963		INITIAL FERTILIZER	92.00	TON		\$	
1280	05964		20-10-10 FERTILIZER	24.00	TON		\$	
1290	05985		SEEDING AND PROTECTION	413,596.00	SQYD		\$	
1300	05989		SPECIAL SEEDING CROWN VETCH	27,622.00	SQYD		\$	
1310	05992		AGRICULTURAL LIMESTONE	280.00	TON		\$	
1320	06510		PAVE STRIPING-TEMP PAINT-4 IN	127,152.00	LF		\$	
1330	06514		PAVE STRIPING-PERM PAINT-4 IN	156,942.00	LF		\$	
1340	06550		PAVE STRIPING-TEMP REM TAPE-W	32,457.00	LF		\$	
1350	06551		PAVE STRIPING-TEMP REM TAPE-Y	32,457.00	LF		\$	
1360	06565		PAVE MARKING-THERMO X-WALK-6 IN	843.00	LF		\$	
1370	06568		PAVE MARKING-THERMO STOP BAR-24IN	230.00	LF		\$	
1380	06569		PAVE MARKING-THERMO CROSS-HATCH	5,371.00	SQFT		\$	
1390	06574		PAVE MARKING-THERMO CURV ARROW	44.00	EACH		\$	
1400	06576		PAVE MARKING-THERMO ONLY	1.00	EACH		\$	
1410	06578		PAVE MARKING-THERMO MERGE ARROW	4.00	EACH		\$	
1420	06588		PAVEMENT MARKER TY IVA-BY TEMP	1,093.00	EACH		\$	
1430	08001		STRUCTURE EXCAVATION-COMMON	588.00	CUYD		\$	
1440	08002		STRUCTURE EXCAV-SOLID ROCK	53.00	CUYD		\$	
1450	08100		CONCRETE-CLASS A	8.30	CUYD		\$	
1460	08903		CRASH CUSHION TY VI CLASS BT TL3	11.00	EACH		\$	
1470	20000ES724		TREE	28.00	EACH		\$	
1480	20259ED		TEMPORARY MEDIAN CROSSOVER	4.00	EACH		\$	
1490	20424EC		CONNECT TO EXIST MANHOLE	1.00	EACH		\$	
1500	20914ED		ROLLED CURB AND GUTTER	146.00	LF		\$	
1510	21342ED		FORM LINER (COBBLESTONE)	2,671.00	SQFT		\$	
1520	23139EN		STRIPING REMOVAL	55,072.00	LF		\$	
1530	23158ES505		DETECTABLE WARNINGS	1,299.00	SQFT		\$	
1540	23274EN11F		TURF REINFORCEMENT MAT 1	28,797.00	SQYD		\$	
1550	24096EC		REMOVE AND RESET END TREATMENT	2.00	EACH		\$	
1560	24814EC		PIPELINE INSPECTION	11,762.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1570	00440		ENTRANCE PIPE-15 IN	431.00	LF		\$	
1580	00441		ENTRANCE PIPE-18 IN	136.00	LF		\$	
1590	00443		ENTRANCE PIPE-24 IN	118.00	LF		\$	
1600	00461		CULVERT PIPE-15 IN	52.00	LF		\$	
1610	00462		CULVERT PIPE-18 IN	976.00	LF		\$	
1620	00464		CULVERT PIPE-24 IN	171.00	LF		\$	
1630	00466		CULVERT PIPE-30 IN	404.00	LF		\$	
1640	00468		CULVERT PIPE-36 IN	133.00	LF		\$	
1650	00469		CULVERT PIPE-42 IN	230.00	LF		\$	
1660	00470		CULVERT PIPE-48 IN	149.00	LF		\$	
1670	00498		CULVERT PIPE-42 IN EQUIV	41.00	LF		\$	
1680	00500		CULVERT PIPE-54 IN EQUIV	46.00	LF		\$	
1690	00521		STORM SEWER PIPE-15 IN	6,440.00	LF		\$	
1700	00522		STORM SEWER PIPE-18 IN	2,768.00	LF		\$	
1710	00524		STORM SEWER PIPE-24 IN	3,537.00	LF		\$	
1720	00525		STORM SEWER PIPE-27 IN	115.00	LF		\$	
1730	00526		STORM SEWER PIPE-30 IN	1,064.00	LF		\$	
1740	00528		STORM SEWER PIPE-36 IN	265.00	LF		\$	
1750	00530		STORM SEWER PIPE-48 IN	128.00	LF		\$	
1760	00556		STORM SEWER PIPE-30 IN EQUIV	3,644.00	LF		\$	
1770	00560		STORM SEWER PIPE-48 IN EQUIV	118.00	LF		\$	
1780	01204		PIPE CULVERT HEADWALL-18 IN	6.00	EACH		\$	
1790	01204		PIPE CULVERT HEADWALL-18 IN	3.00	EACH		\$	
1800	01210		PIPE CULVERT HEADWALL-30 IN	1.00	EACH		\$	
1810	01210		PIPE CULVERT HEADWALL-30 IN	1.00	EACH		\$	
1820	01212		PIPE CULVERT HEADWALL-36 IN	1.00	EACH		\$	
1830	01214		PIPE CULVERT HEADWALL-42 IN	3.00	EACH		\$	
1840	01215		PIPE CULVERT HEADWALL-42 IN EQUIV	1.00	EACH		\$	
1850	01216		PIPE CULVERT HEADWALL-48 IN	4.00	EACH		\$	
1860	01374		METAL END SECTION TY 1-30 IN	1.00	EACH		\$	
1870	01390		METAL END SECTION TY 3-15 IN	28.00	EACH		\$	
1880	01391		METAL END SECTION TY 3-18 IN	22.00	EACH		\$	
1890	01393		METAL END SECTION TY 3-24 IN	9.00	EACH		\$	
1900	01394		METAL END SECTION TY 3-30 IN	6.00	EACH		\$	
1910	01395		METAL END SECTION TY 3-36 IN	5.00	EACH		\$	
1920	01396		METAL END SECTION TY 3-42 IN	1.00	EACH		\$	
1930	01397		METAL END SECTION TY 3-48 IN	1.00	EACH		\$	
1940	01456		CURB BOX INLET TYPE A	127.00	EACH		\$	
1950	01480		CURB BOX INLET TYPE B	13.00	EACH		\$	
1960	01487		CURB BOX INLET TYPE F	3.00	EACH		\$	
1970	01490		DROP BOX INLET TYPE 1	7.00	EACH		\$	
1980	01496		DROP BOX INLET TYPE 3	10.00	EACH		\$	
1990	01499		DROP BOX INLET TYPE 4	3.00	EACH		\$	
2000	01514		DROP BOX INLET TYPE 5E	1.00	EACH		\$	
2010	01517		DROP BOX INLET TYPE 5F	13.00	EACH		\$	
2020	01538		DROP BOX INLET TYPE 7	3.00	EACH		\$	
2030	01544		DROP BOX INLET TYPE 11	1.00	EACH		\$	
2040	01559		DROP BOX INLET TYPE 13G	11.00	EACH		\$	
2050	01568		DROP BOX INLET TYPE 13S	2.00	EACH		\$	
2060	01577		DROP BOX INLET TYPE 14	2.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2070	01585		REMOVE DROP BOX INLET	1.00	EACH		\$	
2080	01641		JUNCTION BOX-15 IN	1.00	EACH		\$	
2090	01642		JUNCTION BOX-18 IN	1.00	EACH		\$	
2100	01643		JUNCTION BOX-24 IN	2.00	EACH		\$	
2110	01645		JUNCTION BOX-36 IN	2.00	EACH		\$	
2120	01767		MANHOLE TYPE C	3.00	EACH		\$	
2130	01789		RECONSTRUCT MANHOLE	1.00	EACH		\$	
2140	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	33,460.00	SQYD	\$2.00	\$	\$66,920.00
2150	21880NN		METAL END SECTION TY 3-42 IN EQUIV	1.00	EACH		\$	
2160	23048NN		METAL END SECTION TY 3-54 IN EQ	2.00	EACH		\$	

Section: 0005 - BRIDGE - CSX RR, DWG. 24693

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2170	02231		STRUCTURE GRANULAR BACKFILL	944.00	CUYD		\$	
2180	02998		MASONRY COATING	4,613.00	SQYD		\$	
2190	03299		ARMORED EDGE FOR CONCRETE	453.00	LF		\$	
2200	08002		STRUCTURE EXCAV-SOLID ROCK	3,083.00	CUYD		\$	
2210	08003		FOUNDATION PREPARATION (5-117.10 - CSX BRIDGE)	1.00	LS		\$	
2220	08033		TEST PILES	43.00	LF		\$	
2230	08039		PRE-DRILLING FOR PILES	164.00	LF		\$	
2240	08046		PILES-STEEL HP12X53	1,040.00	LF		\$	
2250	08094		PILE POINTS-12 IN	67.00	EACH		\$	
2260	08100		CONCRETE-CLASS A	1,696.00	CUYD		\$	
2270	08104		CONCRETE-CLASS AA	1,297.70	CUYD		\$	
2280	08150		STEEL REINFORCEMENT	280,575.00	LB		\$	
2290	08151		STEEL REINFORCEMENT-EPOXY COATED	344,535.00	LB		\$	
2300	08635		PRECAST PC I BEAM TYPE 6	4,282.10	LF		\$	
2310	21532ED		RAIL SYSTEM TYPE III	1,472.00	LF		\$	
2320	23964EC		PROTECTIVE FENCE	1,472.00	LF		\$	

Section: 0006 - BRIDGE - I-65 - DWG. 24691

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2330	02231		STRUCTURE GRANULAR BACKFILL	914.00	CUYD		\$	
2340	02731		REMOVE STRUCTURE (5-117.20 - REMOVE EXISTING RETAINING WALL)	1.00	LS		\$	
2350	02998		MASONRY COATING	1,243.00	SQYD		\$	
2360	03299		ARMORED EDGE FOR CONCRETE	102.70	LF		\$	
2370	08002		STRUCTURE EXCAV-SOLID ROCK	75.00	CUYD		\$	
2380	08003		FOUNDATION PREPARATION (5-117.20 - I-65 BRIDGE)	1.00	LS		\$	
2390	08018		RETAINING WALL	4,112.00	SQFT		\$	
2400	08033		TEST PILES	59.00	LF		\$	
2410	08046		PILES-STEEL HP12X53	679.10	LF		\$	
2420	08094		PILE POINTS-12 IN	30.00	EACH		\$	
2430	08100		CONCRETE-CLASS A	132.70	CUYD		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2440	08104		CONCRETE-CLASS AA	441.20	CUYD		\$	
2450	08150		STEEL REINFORCEMENT	25,686.00	LB		\$	
2460	08151		STEEL REINFORCEMENT-EPOXY COATED	100,257.00	LB		\$	
2470	08269		ELECTRICAL CONDUIT (5-117.20 - APPROXIMATE LENGTH OF 512 FEET)	1.00	LS		\$	
2480	08635		PRECAST PC I BEAM TYPE 6	1,262.50	LF		\$	
2490	21532ED		RAIL SYSTEM TYPE III	511.50	LF		\$	

Section: 0007 - BRIDGE - CULVERT - SINGLE RCBC 8' X 3 ' DWG. 24614

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2500	08003		FOUNDATION PREPARATION (5-117.10 - CULVERT, 24614)	1.00	LS		\$	
2510	08100		CONCRETE-CLASS A	83.80	CUYD		\$	
2520	08150		STEEL REINFORCEMENT	12,082.00	LB		\$	

Section: 0008 - BRIDGE - BLUE LICK CREEK - DWG. 24695

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2530	02231		STRUCTURE GRANULAR BACKFILL	156.00	CUYD		\$	
2540	02596		FABRIC-GEOTEXTILE TYPE I	2,846.00	SQYD		\$	
2550	02998		MASONRY COATING	5,555.00	SQYD		\$	
2560	03299		ARMORED EDGE FOR CONCRETE	170.00	LF		\$	
2570	08002		STRUCTURE EXCAV-SOLID ROCK	128.00	CUYD		\$	
2580	08003		FOUNDATION PREPARATION (5-117.20 - BLUE LICK CREEK)	1.00	LS		\$	
2590	08019		CYCLOPEAN STONE RIP RAP	2,816.00	TON		\$	
2600	08033		TEST PILES	207.00	LF		\$	
2610	08046		PILES-STEEL HP12X53	2,965.00	LF		\$	
2620	08094		PILE POINTS-12 IN	114.00	EACH		\$	
2630	08100		CONCRETE-CLASS A	476.90	CUYD		\$	
2640	08104		CONCRETE-CLASS AA	589.90	CUYD		\$	
2650	08150		STEEL REINFORCEMENT	76,519.00	LB		\$	
2660	08151		STEEL REINFORCEMENT-EPOXY COATED	131,960.00	LB		\$	
2670	08633		PRECAST PC I BEAM TYPE 3	1,697.50	LF		\$	
2680	21532ED		RAIL SYSTEM TYPE III	691.30	LF		\$	

Section: 0009 - BRIDGE - CULVERT - DWG. 24615

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2690	08002		STRUCTURE EXCAV-SOLID ROCK	233.10	CUYD		\$	
2700	08003		FOUNDATION PREPARATION (5-117.20 - CULVERT 24615)	1.00	LS		\$	
2710	08100		CONCRETE-CLASS A	218.60	CUYD		\$	
2720	08150		STEEL REINFORCEMENT	19,809.00	LB		\$	

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Section: 0010 - UTILITY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2730	01069		STEEL ENCASEMENT PIPE-12 IN (300MM, OPEN CUT-WINDSTREAM: BLUE LICK ROAD)	70.00	LF		\$	
2740	24725EC		UTILITY RELOCATION (LG&E-ELECTRIC, 5-117.10)	1.00	LS		\$	
2750	24725EC		UTILITY RELOCATION (LG&E-GAS, 5-117.10)	1.00	LS		\$	
2760	24725EC		UTILITY RELOCATION (LG&E-ELECTRIC, 5-117.20)	1.00	LS		\$	
2770	24725EC		UTILITY RELOCATION (WINDSTREAM, 5-117.10)	1.00	LS		\$	
2780	24725EC		UTILITY RELOCATION (LG&E-GAS, 5-117.20)	1.00	LS		\$	
2790	24725EC		UTILITY RELOCATION (TIME WARNER CABLE, 5-117.10)	1.00	LS		\$	
2800	24725EC		UTILITY RELOCATION (TIME WARNER CABLE, 5-117.20)	1.00	LS		\$	
2810	24725EC		UTILITY RELOCATION (5-117.10 - BULLITT CO. SCHOOLS)	1.00	LS		\$	
2820	24725EC		UTILITY RELOCATION (WINDSTREAM, 5-117.20)	1.00	LS		\$	

Section: 0011 - SEWER

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2830	01055		SEWER PIPE-15 IN (PVC, GRAVITY, OPEN CUT)	334.00	LF		\$	
2840	21382ND		CUT AND PLUG-8 IN (PVC)	2.00	EACH		\$	
2850	22986NN		TIE NEW 15 IN PVC SEWER TO EXIST MANHOLE	2.00	EACH		\$	

Section: 0012 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2860	06406		SBM ALUM SHEET SIGNS .080 IN	790.00	SQFT		\$	
2870	06407		SBM ALUM SHEET SIGNS .125 IN	120.00	SQFT		\$	
2880	06410		STEEL POST TYPE 1	1,624.00	LF		\$	
2890	06412		STEEL POST MILE MARKERS	8.00	EACH		\$	
2900	20418ED		REMOVE & RELOCATE SIGNS	1.00	EACH		\$	
2910	24631EC		BARCODE SIGN INVENTORY	165.00	EACH		\$	

Section: 0013 - SIGNALIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2920	04792		CONDUIT-1 IN	70.00	LF		\$	
2930	04793		CONDUIT-1 1/4 IN	230.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2940	04795		CONDUIT-2 IN	160.00	LF		\$	
2950	04811		ELECTRICAL JUNCTION BOX TYPE B	5.00	EACH		\$	
2960	04820		TRENCHING AND BACKFILLING	460.00	LF		\$	
2970	04830		LOOP WIRE	3,743.00	LF		\$	
2980	04844		CABLE-NO. 14/5C	3,466.00	LF		\$	
2990	04850		CABLE-NO. 14/1 PAIR	2,288.00	LF		\$	
3000	04885		MESSENGER-10800 LB	900.00	LF		\$	
3010	04895		LOOP SAW SLOT AND FILL	1,436.00	LF		\$	
3020	04931		INSTALL CONTROLLER TYPE 170	2.00	EACH		\$	
3030	04932		INSTALL STEEL STRAIN POLE	8.00	EACH		\$	
3040	04950		REMOVE SIGNAL EQUIPMENT	1.00	EACH		\$	
3050	20093NS835		INSTALL PEDESTRIAN HEAD-LED	12.00	EACH		\$	
3060	20094ES835		TEMP RELOCATION OF SIGNAL HEAD	38.00	EACH		\$	
3070	20188NS835		INSTALL LED SIGNAL-3 SECTION	19.00	EACH		\$	
3080	21743NN		INSTALL PEDESTRIAN DETECTOR	12.00	EACH		\$	
3090	23157EN		TRAFFIC SIGNAL POLE BASE	35.00	CUYD		\$	
3100	23222EC		INSTALL SIGNAL PEDESTAL	4.00	EACH		\$	
3110	23982EC		INSTALL ANTENNA	2.00	EACH		\$	

Section: 0014 - WATERLINE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3120	14002		W AIR RELEASE VALVE SPECIAL	4.00	EACH		\$	
3130	14009		W ENCASMENT STEEL BORED RANGE 4	23.00	LF		\$	
3140	14010		W ENCASMENT STEEL BORED RANGE 5	276.00	LF		\$	
3150	14017		W ENCASMENT STEEL OPEN CUT RANGE 6	341.00	LF		\$	
3160	14019		W FIRE HYDRANT ASSEMBLY	2.00	EACH		\$	
3170	14020		W FIRE HYDRANT RELOCATE	14.00	EACH		\$	
3180	14030		W METER RELOCATE	54.00	EACH		\$	
3190	14036		W PIPE DUCTILE IRON 06 INCH (150 MM)	296.00	LF		\$	
3200	14037		W PIPE DUCTILE IRON 08 INCH (200 MM)	125.00	LF		\$	
3210	14039		W PIPE DUCTILE IRON 12 INCH (300 MM)	8,583.00	LF		\$	
3220	14040		W PIPE DUCTILE IRON 16 INCH (400 MM)	1,939.00	LF		\$	
3230	14042		W PIPE DUCTILE IRON 24 INCH (600 MM)	9,915.00	LF		\$	
3240	14055		W PIPE DUCTILE IRON SPECIAL (600 MM)	394.00	LF		\$	
3250	14074		W PLUG EXISTING MAIN	31.00	EACH		\$	
3260	14081		W SERVICE RELOCATE	55.00	EACH		\$	
3270	14084		W SERV PE/PLST SHORT SIDE 2 IN	1.00	EACH		\$	
3280	14094		W TIE-IN 06 INCH (150 MM)	5.00	EACH		\$	
3290	14095		W TIE-IN 08 INCH (200 MM)	3.00	EACH		\$	
3300	14097		W TIE-IN 12 INCH (300 MM)	11.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3310	14098		W TIE-IN 16 INCH (400 MM)	2.00	EACH		\$	
3320	14098		W TIE-IN 16 INCH (400 MM)	10.00	EACH		\$	
3330	14100		W TIE-IN 24 INCH (600 MM)	1.00	EACH		\$	
3340	14105		W VALVE 06 INCH (150 MM)	6.00	EACH		\$	
3350	14106		W VALVE 08 INCH (200 MM)	3.00	EACH		\$	
3360	14108		W VALVE 12 INCH (300 MM)	22.00	EACH		\$	
3370	14109		W VALVE 16 INCH (400 MM)	6.00	EACH		\$	
3380	14111		W VALVE 24 INCH (600 MM, MJ GATE)	12.00	EACH		\$	
3390	14139		W PRESSURE REDUCING VALVE 16 INCH (400 MM)	1.00	EACH		\$	

Section: 0015 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3400	02568		MOBILIZATION	1.00	LS		\$	
3410	02569		DEMOBILIZATION	1.00	LS		\$	