



CALL NO. 400

CONTRACT ID. 141275

BULLITT COUNTY

FED/STATE PROJECT NUMBER 121GR14D075-FD04

DESCRIPTION PRESTON HIGHWAY (KY 61)

WORK TYPE GRADE & DRAIN AND PAVEMENT ALTERNATES

PRIMARY COMPLETION DATE 11/30/2017

LETTING DATE: October 24,2014

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN DAYLIGHT TIME October 24,2014. Bids will be publicly announced at 10:00 AM EASTERN DAYLIGHT TIME.

PLANS AVAILABLE FOR THIS PROJECT.

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

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PART I

SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 05

CONTRACT ID - 141275
121GR14D075-FD04
COUNTY - BULLITT
PCN - DE01500611475
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 - DE01500611476
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 11/30/2017 APPLIES TO ENTIRE CONTRACT

CONTRACT NOTES

PROPOSAL ADDENDA

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

BID SUBMITTAL

Bidder must use the Department's Expedite Bidding Program available on the Internet web site of the Department of Highways, Division of Construction Procurement. (www.transportation.ky.gov/construction-procurement)

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 PIPE INSPECTION

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

SPECIAL NOTE FOR COMPOSITE OFFSET BLOCKS

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

REGISTRATION WITH THE SECRETARY OF STATE BY A FOREIGN ENTITY

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

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

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

SPECIAL NOTE FOR PROJECT QUESTIONS DURING ADVERTISEMENT

Questions about projects during the advertisement should be submitted in writing to the Division of Construction Procurement. This may be done by fax (502) 564-7299 or email to kytc.projectquestions@ky.gov. 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

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.

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.

8/15/14

KY 61, Bullitt County
Item Number: 5-117.10 & 5-117.20

SPECIAL NOTE
ALTERNATE PAVEMENT BID ADJUSTMENT

This project includes alternate bidding for asphalt or concrete pavement. There are specific items listed for each pavement type to be bid with the alternate selected by the Contractor. There is also a line item in the alternate categories for each alternate to adjust for the projected out-year life-cycle costs to the Cabinet. These line item adjustments are as follows:

Asphalt Pavement Adjustment= \$767,598

Concrete Pavement Adjustment= \$483,442

The amount reflective of the pavement type selected by each contractor will be added to their respective bid for comparison of the low bid. The adjustment ***shall be used only for determination of the lowest bidder and shall not be used to determine the final payment*** to the contractor when the project is completed.

Please note that these adjustments should not be used for the calculation of the maximum Mobilization amount and are not required to be included in the minimum Demobilization amount.

Proposal Guaranty

As a supplement to Section 102 of the current Standard Specifications, it will not be necessary for the Proposal Guaranty to include an amount necessary to cover the amount of the bid adjustment.

SPECIAL NOTE FOR PURCHASE OF X-RAY FLUORESCENCE SPECTROMETER (XRF)

Provide a new X-Ray Fluorescence Spectrometer and Fusion Bead Machine as part of this contract. Provide a PANalytical Incorporated, AXIOS mAX Advanced X-Ray Fluorescence Spectrometer and Egon 2 Fusion Bead Machine with complete installation and a minimum one-year complete warranty.

Complete installation shall include delivery and manufacturer installation of an AXIOS Advanced XRF Spectrometer and Egon 2 Fusion Bead Machine. The AXIOS XRF shall include; continuous loading option, appropriate primary beam filters, monochromator crystals and collimator masks; gas purge system for liquid analysis; duplex detector and flow detector; a four position monitor sample tray, eight position sample/sample holder tray, four (4) 12 – position 32mm sample trays; OMNIAN Standards and OMNIAN Monitor; laboratory grade air compressor, water-cooled water chiller and AXIOS spare parts modules. On-site installation of SUPERQ Analytical Software, OMNIAN Standardless Analysis Software, WROXI Mineral Module, CEMOXI Cement Database and NIFECO Metals Module to a Department supplied PC operating Windows 7. The Egon 2 Fusion Bead Machine shall include; two (2) ceramic dish holders for 32mm casting dishes and two (2) ceramic crucible holders; four (4) 32mm Platinum casting dishes and four (4) Platinum dimple bottomed crucibles; Platinum ware polishing kit; Reformer for 32mm casting dish; Reshaper for dimple bottomed crucibles and sufficient operating supplies for installation and system verification.

Deliver the X-Ray Fluorescence Spectrometer and Fusion Bead Machine to the Division of Materials located at 1227 Wilkinson Boulevard in Frankfort, Kentucky on or before May 1, 2015.

The Department will measure the quantity for this equipment LUMP SUM. The Department will make payment for an X-Ray Fluorescence Spectrometer and Fusion Bead Machine satisfying the Departments specifications. The Department will consider payment for the X-Ray Fluorescence Spectrometer and Fusion Bead Machine as full compensation for furnishing all work required in this special note.

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 Controller
1	T-01-0501	Conflict Monitor, Model 2018Special Order
4	T-01-0510	Isolator, Model 242 (for ped detector and railroad)
10	T-01-0600	Loop Detector, Model 222
18	T-01-0700	Load Switches

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

Special items		
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		
3	T-04-0020	Steel Strain Pole 30 foot
5	T-04-0030	Steel Strain Pole 32 foot

Electrical Contractor Name

Electrical Contractor Supervisor

Project Engineer

Project Engineer attests that the mentioned contractor is the actual electrical contractor on this project

Signature of Project Engineer or Designee

Contact number for Supervisor

Contact number for Project Engineer

Special Note on Tree Cutting Restrictions

All trees to be removed during construction shall be fallen between October 15, 2014 and March 31, 2015, inclusive. This is a stipulation placed on the project due to the presence of the Indiana Bat. The dates stated above are the periods when the bats are not nesting and the trees can be disturbed. Trees may not be cut outside of this time period unless they are determined by a professional, prequalified by the KYTC in Environmental Aquatic and Terrestrial Systems Analysis, to be unsuitable habitat for the Indiana bat. Any such clearing shall only occur following documented consultation with the US Fish and Wildlife Service.

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.



An Equal Opportunity Employer M/F/D



(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		

[illegible]

Date Analyzed : 10-Sep-14
Analyst : Winterford Mensah

Reviewed By: Hindoo Menon
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.

AJHA #1 02459

KENTUCKY
TRANSPORTATION
CABINET

KYTC
O'Dail Lawson o'dail.lawson@ky.gov

Address: 200 Mero Street

Franklin KY

Phone: 502-782-5020

PO#:

Project or Subject Reference

5-117-10

US 61 0205 CSX

Client Information KY TRANSPORTATION CABINET

Results Code:

ND = None Detected

FTD = Filter Tampering or Damaged

N/A = Not Applicable

UNKNOWN STRUCTURE I.D. LOCATED ON US61
OVER CSX RR @ WATER TOWER ROAD.
I.D.# 015B00001N

Samplers (signature):

David Dunn

[illegible]

Relinquished By:

Date/Time:

Received By:

Date/Time:

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

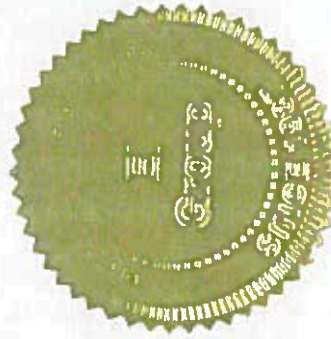
Barry Maxwell, Training Manager

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.



An Equal Opportunity Employer M/F/D



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

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

[illegible]

Date Analyzed : 10-Sep-14
Analyst : Winterford Mensah

Reviewed By: *Vincent M. Mena*
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.

AJHA #1 02459



200 Mero Street, 5th Floor West

Frankfort, Kentucky 40622

(502) 564-7250 fax (502) 564-5655

KYTC

Address: 200 Mero Street

Frankfort KY

Phone: 502-782-5020

PO#:

Client Information **KY TRANSPORTATION CABINET**

Results Code:

ND - None Detected

FTD = Filter Tampering or Damaged

N/A = Not Applicable

Samplers (signature):

Project or Subject Reference

Bullitt 5-117.20

015800030

[illegible]

Relinquished By:

Date/Time:

Received By:

Date/Time:

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

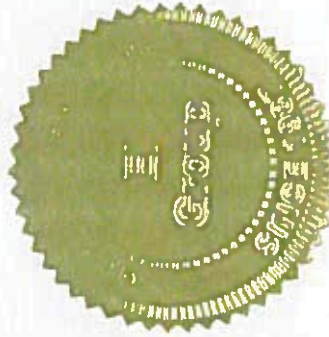
August 15, 2015
Expiration Date

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 # 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. Analytical Laboratory Division

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

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

[illegible]

Date Analyzed : 10-Sep-14
Analyst : Winterford Mensah

Reviewed By: *Hindya Meraf*
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.

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: KY Transportation Cabinet
Address: 200 Mero Street
Frankfort, KY
40601
Attention O'Dail Lawson

Project No: 2109104 B
Sample ID: # 78 - 2
Sampled: 9-Sep-14
Received: 9-Sep-14
Analyzed: 10-Sep-14 - Point Count -

Bulk Sample Analysis

Sampled by:	<u>O'Dail Lawson</u>		
Facility/Location:	<u>Bullitt County - 5-117.20 015 B00078N</u>		
Field Description:	<u>Joint Compound - Tar -</u>		
Laboratory Description:	<u>Thick Black Material</u>		
Asbestos Materials:	<u>Chrysotile - 2/400 = 0.50 % (< 1 %) Sample Is Negative</u>		
Non-asbestos Fibrous Materials & Matrix Materials:			
	<u>Cellulose</u>	<u>0.25 %</u>	
	<u>Binders</u>	<u>99.25 %</u>	
Remarks:	<u>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.</u>		
Analyst:	<u>Winterford Mensah</u>	Reviewed By:	<u></u> Signature

AIHA #102459

/

AIHA #102459

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AIHA #102459

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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

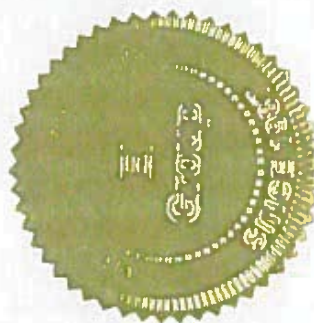
August 15, 2015
Expiration Date

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

Kentucky Transportation Cabinet
Division of Right of Way & UtilitiesTC 69-008
08/2010
Page 1 of 2

SUMMARY FOR KYTC PROJECTS THAT INVOLVE A RAILROAD

Date: 8/29/2014 (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 Shepherdsville Extending Northerly to Existing 4-Lane
Item Number: 05-117.10 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
Train Count (6am to 6pm): 10 Train Count (6pm to 6am): 8 Train Count (24 hr total): 18
Maximum Train Speed: 60 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:

KYTC will be responsible for paying all flagging costs.

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
1717 Dixie Highway, Suite 400
Fort Wright, Kentucky 41011
(Phone) 859-426-6924
(Email) amanda.decesare@csx.com

Regional Representative (Roadmaster):

Jacqueline Torres
CSX Transportation, Inc.
Roadmaster
Louisville, KY

(Phone) 502-364-1119
(Email) _____

Insurance contact:

CSX Corporation
Insurance Department

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

Railroad Designer Contact:

Contractor or In-House Employee? Consultant

Larry J. Shaw, P.E.
URS Corporation
One Indiana Square
Suite 2100
Indianapolis, Indiana 46204
(Phone) 317-532-5481
(Email) larry.shaw@urs.com

Railroad Construction Contact:

Contractor or In-House Employee? Consultant

Wayne Bolen, P.E.
URS Corporation
525 Vine Street
Suite 1800
Cincinnati, Ohio 45202
(Phone) 513-419-3488
(Email) wayne.bolen@urs.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:

Diana Radcliffe, Director
Div. of Construction Procurement
Kentucky Transportation Cabinet
200 Mero Street, 3rd Floor West
Frankfort, Kentucky 40622
(Phone) 502-564-3500
(Email) Diana.radcliffe@ky.gov

KYTC Construction Director:

Ryan Griffith, Director
Div. of Construction
Kentucky Transportation Cabinet
200 Mero Street, 3rd Floor West
Frankfort, Kentucky 40622
(Phone) 502-564-4780
(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.



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 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. Authorized endorsements must include the Pollution Exclusion Amendment – CG 28 31, unless using form CG 00 35 version 96 and later.
 - f. 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
 - g. Authorized endorsements may not include:
 - (i). A Pollution Exclusion Endorsement except CG 28 31
 - (ii). A Punitive or Exemplary Damages Exclusion
 - (iii). A “Common Policy Conditions” Endorsement
 - (iv). And endorsement that is not named in Section 4 (e) or (f) above.
 - (v). Policies that contain any type of deductible
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. Evidence of insurance as required above shall be furnished to the address shown on the attached Summary Sheet for review by the Department and transmittal to the Railroad.*
- E. 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.*
- F. 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.*

CSX TRANSPORTATION
CONSTRUCTION SUBMISSION CRITERIA

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CONSTRUCTION SUBMISSION CRITERIA

INTRODUCTION

The information in this document is intended to improve communication and clarify the CSXT criteria related to construction submissions that may involve CSXT property. All work must be performed in a manner as to not adversely impact existing CSXT operations. Please note that there are other standards associated with construction that must be adhered to including but not limited to the CSXT Special Provisions, CSXT Insurance Requirements as well as governing local, county, state and federal requirements. This document and other CSXT standards are subject to change without notice, and future revisions will be available at the CSXT website www.csx.com.

I. DEFINITIONS

Agency – The project sponsor.

AREMA – American Railway Engineering and Maintenance Association – the North American railroad industry standards group.

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 and supporting calculations shall be signed/sealed by a Professional Engineer as defined below.

Controlled Demolition – Removal of the existing structure or subcomponents in a manner that prevents any portions from falling onto CSXT employees, equipment or property. The proposed procedures shall be detailed in the means and methods submission for CSXT review and acceptance.

Contractor – The Agency's or CSXT's representative retained to perform the project work.

Engineer – CSXT Engineering Representative or a GEC authorized to act on the behalf of CSXT.

GEC – General Engineering Consultant who has been authorized to act on the behalf of CSXT.

Professional Engineer – An engineer who is licensed in State or Commonwealth (if required by the Agency) in which the project is to occur. The drawings and calculations shall be prepared by the Professional Engineer and shall bear his seal and signature.

Submission Review Period - **a minimum of 30 days in advance of start of work.** Up to 30 days will be required for the initial review response. Up to an additional 30 days may be required to review any/all subsequent submissions or resubmission.

CONSTRUCTION SUBMISSION CRITERIA

Theoretical Railroad Live Load Influence Zone – A 1½ Horizontal to 1 Vertical theoretical slope line starting 1’-6” below top of rail elevation and 12’-0” from the centerline of the nearest track.

II. DEMOLITION PROCEDURE:

The Agency or its contractor shall submit as defined above, a detailed procedure for demolition of the structure over Railroad Tracks.

- A. The Agency or its Contractor shall submit the detailed procedure for demolition of existing structures over or adjacent to CSXT’s tracks or right-of-way. This procedure shall include a plan showing the locations of cranes, horizontally and vertically, operating radii, with loading or disposal locations shown, with all dimensions referenced from the center line of the near track, including beam placement on ground or truck loading staging plan. The plan shall also include 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 should be shown. No crane or equipment may be set on the CSXT rails or track structure and no material may be dropped on CSXT property.
- B. Also included with this submittal the following information:
 - 1. Computations showing weight of picks must be submitted. Computations shall be made from field verified plans of the existing structure beams being removed and those plans or sections thereof shall also be included in the submittal; the weight shall include the weight of concrete or other materials including lifting rigging.
 - 2. If the sponsor can prove to CSXT that plans do not exist and weights must be calculated from field measurements, the field measurements are to be made under the supervision of the Professional Engineer submitting the procedure and shall include sketches and estimated weight calculations with the procedure. If possible, field measurements shall be taken with a CSXT representative present.
 - 3. Crane rating sheets showing cranes to be adequate for 150% of the actual weight of the pick. A complete set of crane charts, including crane, counterweight, maximum boom angle, and boom nomenclature is to be submitted. Safety factors that may have

CONSTRUCTION SUBMISSION CRITERIA

been “built in” to the crane charts are not to be considered when determining the 150% Factor of Safety.

4. A data sheet shall be prepared listing the type, size and arrangements of slings, shackles, or other connecting equipment. Include copies of a catalog or information sheets for specialized equipment. All specific components proposed for use shall be clearly identified and highlighted in the submitted documents. The safe working load capacity of the connecting equipment shall be 150% above the calculated weight of the pick.
5. A complete written procedure is to be included that describes the sequence of events, indicating the order of lifts and any repositioning or rehitching of the crane or cranes.
6. 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.
7. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor’s means and methods submission.
8. 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. A guardrail will be required to be installed in a track where a temporary bent is located within twelve (12) feet from the centerline of that track. The guardrail will be installed by CSXT forces at the expense of the Agency or its contractor.
9. Existing, obsolete, bridge piers shall be removed to a minimum of 3’-0” below the finished grade, final ditch line invert, or as directed by the Engineer.
10. A minimum quantity of 25 Tons of CSXT approved track ballast may be required to be furnished and stockpiled on site by the Contractor, or as directed by the Engineer.

CONSTRUCTION SUBMISSION CRITERIA

11. CSXT's tracks, signals, structures, and other facilities shall be protected from damage during demolition of existing structure or replacement of deck slab.

NOTE: On-track or ground level debris shields such as crane mats are prohibited for use by CSXT.

- C. Overhead Demolition Debris Shield - Shall be installed prior to the demolition of the bridge deck or other relevant portions of the superstructure.

1. The demolition debris shield shall be erected from the underside of the bridge over the track area to catch all falling debris.
2. The Contractor shall include the demolition debris shield installation/removal means and methods as part of the proposed Controlled Demolition procedure submission.
3. The demolition debris shield shall provide 23'-0" minimum vertical clearance or maintain the existing vertical clearance if the existing clearance is less than 23'-0" as approved by CSXT. Horizontal clearance to the centerline of the track should not be reduced unless approved by the Engineer.
4. The vertical clearance ATR (above top of rail) is measured from the top of rail to the lowest point on the overhead shielding system measured within a distance of 6'-0" out from each side of the track centerline.
5. The demolition debris shield design and supporting calculations all signed/sealed by a Professional Engineer, shall be submitted for review and acceptance.
6. The demolition debris shield shall have a **minimum** design load of 50 pounds per square foot **plus** the weight of the equipment, debris, personnel, and other loads to be carried.
7. The Contractor shall include the proposed bridge deck removal procedure in its demolition means and methods and shall verify that the size and quantity of the demolition debris generated by the procedure does not exceed the shield design loads.
8. 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.

- D. Vertical Demolition Debris Shield – This type of shield may be required for substructure removals in close proximity to CSXT track and other facilities, as determined by the Engineer.

CONSTRUCTION SUBMISSION CRITERIA

1. Prior to commencing the demolition activity, the Contractor shall install a ballast protection system consisting of geotextile to keep the railroad ballast from becoming fouled with construction or demolition debris and fines. The geotextile ballast protection system shall be installed and maintained by the Contractor for the project duration in accordance with the attached plan, or with additional measures as directed by the Engineer.
 2. The Agency, or its Contractor, shall submit detailed plans, with detailed calculations, prepared and submitted by a Professional Engineer of the protection shield and ballast protection systems for approval prior to the start of demolition.
 3. Blasting will not be permitted to demolish a structure over or within CSXT's right-of-way.
- E. The Controlled Demolition procedure must be approved by the **Engineer** prior to undertaking work on the project.
- F. The Contractor shall provide timely communication to the Engineer when scheduling the demolition related work so that the Engineer may be present during the entire demolition procedure.
- G. At any time during demolition activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances which 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. ERECTION PROCEDURE:

The Agency or its Contractor shall submit a detailed procedure for performing erection on/about CSXT property, as defined above.

- A. The Agency or its Contractor shall submit six (6) copies of the detailed procedure for erection of the proposed structures over or adjacent to CSXT's tracks or right-of-way. This procedure shall include a plan showing the locations of cranes, horizontally and vertically, operating radii, with staging locations shown, including beam placement on ground or truck unloading staging plan. Plan should also include the location of all tracks, other railroad facilities; wires, poles, adjacent structures, or

CONSTRUCTION SUBMISSION CRITERIA

buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions should be shown. No crane or equipment may be set on the CSXT rails or track structure.

B. Also included with this submittal the following information:

1. As-Built Bridge Seat Elevations - All as-built bridge seats and top of rail elevations shall be furnished to the Engineer for review and verification at least 30 days in advance of construction or erection, to ensure that minimum vertical clearances as approved in the plans will be achieved.
2. Computations showing weight of picks must be submitted. Computations shall be made from plans of the structure beams being erected and those plans or sections thereof shall also be included in the submittal; the weight shall include the weight of concrete or other materials including lifting rigging.
3. Crane rating sheets showing cranes to be adequate for 150% of the actual weight of the pick. A complete set of crane charts, including crane, counterweight, maximum boom angle, and boom nomenclature is to be submitted. Safety factors that may have been "built in" to the crane charts are not to be considered when determining the 150% Factor of Safety.
4. A data sheet shall be prepared listing the type, size and arrangements of slings, shackles, or other connecting equipment. Include copies of a catalog or information sheets for specialized equipment. All specific components proposed for use shall be clearly identified and highlighted in the submitted documents. The safe working load capacity of the connecting equipment shall be 150% above the calculated weight of the pick.
5. A complete written procedure is to be included that describes the sequence of events, indicating the order of lifts and any repositioning or re hitching of the crane or cranes.
6. 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 sub tasks (i.e., performing aerial splices, installing temporary bracing, etc.) shall be furnished so that the potential impact(s) to CSXT operations may be assessed and eliminated or minimized.

CONSTRUCTION SUBMISSION CRITERIA

7. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.
 8. 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. A guardrail will be required to be installed in a track where a temporary bent is located within twelve (12) feet from the centerline of that track.
- C. The proposed Erection procedure must be approved by the Engineer prior to undertaking work on the project.
- D. The Contractor shall provide timely communication to the Engineer when scheduling the erection related work so that the Engineer may be present during the entire erection procedure.
- E. At any time during construction activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances which 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.

IV. EXCAVATION AND SHORING:

The Agency or its contractor shall submit as defined above, a detailed procedure for the installing sheeting/shoring adjacent to Railroad Tracks.

- A. Shoring protection shall be provided when excavating adjacent to an active track or railroad facility or as determined by CSXT. Shoring will be provided in accordance with AREMA *Manual for Railway Engineering* Chapter 8, part 28; except as noted below.
- B. Shoring may not be required if all of the following conditions are satisfied:
1. Excavation does not encroach upon a 1½ horizontal: 1 vertical theoretical slope line starting 1'-6" below top of rail and at 12'-0" minimum from centerline of the track (live load influence zone).
 2. Track is on level ground or in a cut section and on stable soil.

CONSTRUCTION SUBMISSION CRITERIA

3. Excavation does not adversely impact the stability of a CSXT facility (i.e. signal bungalow, drainage facility, undergrade bridge, building, etc.).
 4. Shoring is not required by any governing construction code.
- C. When the track is on an embankment, excavating the toe of the embankment without shoring may affect the stability of the embankment. Therefore, excavation of the embankment toe without shoring will not be permitted.
- D. Trench Boxes are prohibited for use on CSXT within the Theoretical Railroad Live Load Influence Zone.
- E. The required protection is the cofferdam type that completely encloses the excavation. Where dictated by conditions, partial cofferdams with open sides away from the track may be used. Cofferdams shall be constructed using steel sheet piling, or when approved by the Engineer, steel soldier piles with timber lagging. Wales and struts shall be provided and designed as needed. The following shall be considered when designing cofferdams:
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, 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 Manual for Railway Engineering*, Chapter 7, 8, and 15.
 3. A construction procedure for temporary shoring shall be shown on the drawing.
 4. All shoring systems on or adjacent to CSXT right-of-way shall be equipped with railings or other approved fall protection.
 5. A minimum horizontal clearance of 10'-0" from centerline of the track to face of nearest point of shoring shall be maintained provided a 12'-0" roadbed is maintained with a temporary walkway and handrail system.

CONSTRUCTION SUBMISSION CRITERIA

F. The contractor shall submit the following drawings and calculations (all shall be signed/sealed by a Professional Engineer) for CSXT's review and approval.

1. Six (6) sets of detailed drawings of the shoring systems showing sizes of all structural members, details of connections, and distances from centerline of track to face of shoring. Drawing shall show a section showing height of shoring and track elevation in relation to bottom of excavation.
2. Six (6) sets of calculations of the shoring design.

The drawings and calculations shall be prepared by a Licensed Professional Engineer in the State (if required by the Agency) where the shoring is to be constructed and shall bear his seal and signature. Shoring plans shall be approved by CSXT's construction engineering and inspection representative.

3. For sheeting and shoring within 18'-0" of the centerline of the track, the live load influence zone, and in slopes, the contractor shall use interlocked steel sheeting (sheet pile).
4. Sheet pile installed in slopes or within 18'-0" of the centerline of track shall not be removed.
5. Sheet piles shall be cut off a minimum of 3'-0" below the finished grade, ditch line invert, or as directed by the **Engineer**. The ground shall be backfilled and compacted immediately after sheet pile is cut off.
6. A procedure for cutting off the sheet pile and restoring the embankment shall be submitted to the Engineer for review and acceptance.

G. Blasting is not permitted on or adjacent to CSXT right-of-way without prior written approval from the **Engineer**. 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 comply with all of the following:

1. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Agency or Contractor.

CONSTRUCTION SUBMISSION CRITERIA

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 as required by the CSXT Special Provisions 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 which 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.

V. TRACK MONITORING

The Agency or its Contractor shall submit for CSXT review and approval, a detailed track monitoring program to detect both horizontal and vertical movement of the CSXT track and roadbed, a minimum of 30 days in advance of start of work.

- A. For the installation of temporary or permanent shoring systems, including but not limited to soldier piles and lagging, and interlocked steel sheeting on or adjacent to CSXT's right-of-way, the contractor may be required to

CONSTRUCTION SUBMISSION CRITERIA

submit a detailed track monitoring program for CSXT's approval prior to performing any work near CSXT's right-of-way.

- 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.

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: _____

Right-of-Way Certification Form

Revised 2/22/11

☒ Federal Funded
☐ State Funded

☒ Original
☐ Re-Certification

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

Date: 9/12/14

Project Name: Widen KY 61
Project #: 12FO FD52 015 5325101R
Item #: 5-117.10

Letting Date: November 2013
County: BULLITT
Federal #: OSTPR 05116 019

Description of Project Widen KY 61 from Shepherdsville to 4-lane section

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

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

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

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

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

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

Right-of-Way Certification Form

Revised 2/22/11

☒ **Condition 3.** The acquisition or right of occupancy and use of a few remaining parcels are not complete and/or some parcels still have occupants. However, all remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. The KYTC is hereby requesting authorization to advertise this project for bids and to proceed with bid letting even though the necessary rights-of-way will not be fully acquired, and/or some occupants will not be relocated, and/or the fair market value will not be paid or deposited with the court for some parcels until after bid letting. KYTC will fully meet all the requirements outlined in 23 CFR 635.309(c)(3) and 49 CFR 24.102(j) and will expedite completion of all acquisitions, relocations, and full payments after bid letting and prior to AWARD of the construction contract or force account construction. A full explanation and reason for this request, including identification of each such parcel and dates on which acquisitions, payments, and relocations will be completed, is attached to this certification form for FHWA concurrence. (See note 2.)

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

Approved: Ron Geveden  Right-of-Way Supervisor
Printed Name Signature

Approved: DM Log  Actg 12 SEP 2014
Printed Name Signature KYTC, Director of ROW & Utilities

No Signature Required
as per FHWA - KYTC

Approved: 2013 Stewardship Agreement FHWA, ROW Officer (when applicable)
Printed Name Signature

Right-of-Way Certification Form

Revised 2/22/11

Date: 9/12/14

Project Name: Widen KY 61
Project #: 12FO FD52 015 5325101R
Item #: 5-117.10
Letting Date: November 2013

County: BULLITT
Federal #: OSTPR 05116 019

This project has 97 total number of parcels to be acquired, and 45 total number of individuals or families to be relocated, as well as _____ total number of businesses to be relocated.

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

Parcel #	Name/Station	Explanation for delayed acquisition, delayed relocation, or delayed payment of fair market value	Proposed date of payment or of relocation
		ROW has been acquired for road work.	
		Additional utility easement is needed.	
		Negotiations are ongoing for the following	
		outstanding Parcels:	
		21;22;40;51;52;58;60;64; and 72	

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

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

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

Right-of-Way Certification Form

Revised 2/22/11

☒ Federal Funded☒ Original☐ State Funded☐ Re-Certification

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

Date 8/21/14Project Name Widen KY 61Letting Date November 2013Project # 12FO FD52 015 5325101RCounty BULLITTItem # 5-117.20Federal # OSTPR 05116 019Description of Project Widen KY 61 from Shepherdsville to 4-lane section**Projects that require NO new or additional right-of-way acquisitions and/or relocations**

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

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

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

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

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

Right-of-Way Certification Form

Revised 2/22/11

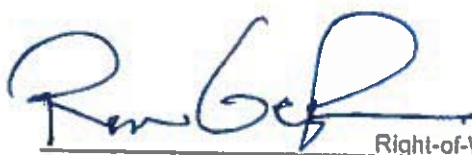
- ☐ **Condition 3.** The acquisition or right of occupancy and use of a few remaining parcels are not complete and/or some parcels still have occupants. However, all remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. The KYTC is hereby requesting authorization to advertise this project for bids and to proceed with bid letting even though the necessary rights-of-way will not be fully acquired, and/or some occupants will not be relocated, and/or the fair market value will not be paid or deposited with the court for some parcels until after bid letting. KYTC will fully meet all the requirements outlined in 23 CFR 635.309(c)(3) and 49 CFR 24.102(j) and will expedite completion of all acquisitions, relocations, and full payments after bid letting and prior to AWARD of the construction contract or force account construction. A full explanation and reason for this request, including identification of each such parcel and dates on which acquisitions, payments, and relocations will be completed, is attached to this certification form for FHWA concurrence. (See note 2.)

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

Approved:

Ron Geveden

Printed Name



Signature

Right-of-Way Supervisor

Approved:

Dean M Loy

Printed Name



Signature

Acting

KYTC, Director of ROW & Utilities

Approved:

Printed Name

No Signature Required
as per FHWA - KYTC
2018 Stewardship Agreement

Signature

FHWA, ROW Officer (when applicable)

Right-of-Way Certification Form

Revised 2/22/11

Date: 8/21/14

Project Name: Widen KY 61

Project #: 12FO FD52 015 5325101R

Item #: 5-117.20

Letting Date: November 2013

County BULLITT

Federal # OSTPR 05116 019

This project has 48 total number of parcels to be acquired, and 15 total number of individuals or families to be relocated, as well as 0 total number of businesses to be relocated.

43 Parcels where acquired by a signed fee simple deed and fair market value has been paid

4 Parcels have been acquired by IOJ through condemnation and fair market value has been deposited with the court

1 Parcels have not been acquired at this time (explain below for each parcel)

_____ Parcels have been acquired or have a "right of entry" but fair market value has not been paid or has not been deposited with the court (explain below for each parcel)

_____ Relocatees have not been relocated from parcels _____, _____, _____, _____, _____, _____, and _____ (explain below for each parcel)

Parcel #	Name/Station	Explanation for delayed acquisition, delayed relocation, or delayed payment of fair market value	Proposed date of payment or of relocation
77	CSX	CSX is waiting on the construction agreement	

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

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

Form Effective Date: April 1, 2006

Last Revised: February 22, 2011

SPECIAL NOTES FOR UTILITY CLEARANCE

IMPACT ON CONSTRUCTION

**BULLITT COUNTY, STP 5116
FD04 015 53251 02U
WIDEN KY 61 CONESTOGA PARKWAY
TO SOUTH OF WEST 4TH STREET (KY 44)
ITEM NO. 5-117.11**

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.

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

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.

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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 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

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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.

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

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. An overhead proposed route will run parallel to 61 from Sta. 1+058 Rt. 10 M to Sta. 2+512 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+241 Rt. 12 M to Sta. 1+242 Lt. 16 M. An overhead proposed route will run parallel to Cherry Street from Cherry Street Sta. 4+984 Lt. 6 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.

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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 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 parallel 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. 13 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+028 Lt. 19 M. An overhead proposed route will run perpendicular to KY 61 from Sta. 2+028 Lt. 19 M to Sta. 2+029 Lt. 34 M. Overhead proposed routes will cross KY 61 from Sta. 2+128 Rt. 12 M to Sta. 2+110 Lt. 13 M, from Sta. 2+128 Rt. 12 M to Sta. 2+138 Lt. 12 M, and from Sta. 2+254 Rt. 13 M to Sta. 2+220 Lt. 20 M. An overhead proposed route will run parallel to KY 61 from Sta. 2+315 Lt. 12 M to Sta. 2+220 Lt. 20 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. 2+460 Lt. 15 M. An overhead proposed route will run perpendicular to KY 61 at Sta. 3+327 Lt. 10 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.

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.

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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 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-

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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.

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

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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.

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		Greg Geiser work: (502) 627-3708 Greg.Geiser@LGE-KU.com

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LG&E Emergency Number (502) 589-1444

LG&E and KU Emergency Number 1-800-331-7370

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	Roger Redford cell – (270) 723-7549 Roger.Redford@Windstream.com
	OR	
	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
6.	East Kentucky Power Coop 4775 Lexington Road	Garry Harvey (859)745-9601

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Winchester, KY 40391		Garry.Harvey@EKPC.coop
	Or	Jason Witt
P O Box 707		Jason.Witt@EKPC.coop
Winchester, KY 40391		Cell: (859) 749-9110
		Office (859) 745-9596
	Or	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.	Insight Communications Company 4701 Commerce Crossings Dr. Louisville, KY 40229	Forrest Antique (502) 817-6519 – Cell (502) 357-4724 – Office Forrest.Antique@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	David Wisner

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539 S Main St, Rm 7642
Findlay, OH 45840

DSWisner@MarathonPetroleum.com
(419) 421-2211

- 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

Jerry Kennedy
(502) 643-3165 (Cell)

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Hillview, KY 40129
502-957-6140 (office)

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

- 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

Donnie Probst
(270) 765-6153

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Elizabethtown, KY 42701

- 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

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

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(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 Sta. 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 contractors.

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**

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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 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

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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 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

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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. 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.

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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. 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.

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

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.

SPECIAL NOTES FOR UTILITY CLEARANCE
IMPACT ON CONSTRUCTION

BULLITT COUNTY, STP 5116
FD04 015 53251 02U
WIDEN KY 61 SOUTH OF BROOKS RUN ROAD
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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	Roger Redford	cell – (270) 723-7549 Roger.Redford@Windstream.com
	OR	
	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

SPECIAL NOTES FOR UTILITY CLEARANCE

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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
6. East Kentucky Power Coop 4775 Lexington Road Winchester, KY 40391	Garry Harvey (859) 745-9601 Garry.Harvey@EKPC.coop
Or	Jason Witt Jason.Witt@EKPC.coop Cell: (859) 749-9110 Office (859) 745-9596
Or	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 sflemming@shepcity.com
8. Insight Communications Company 4701 Commerce Crossings Dr. Louisville, KY 40229	Forrest Antique (502) 817-6519 – Cell (502) 357-4724 – Office Forrest.Antique@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

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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
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

SPECIAL NOTES FOR UTILITY CLEARANCE
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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
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

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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. 8 th St. Louisville, KY 40202	Kevin Webster Kevin.Webster@Level3.com 502-777-8622 Cell (502) 777-8622 Fax (502) 561-6950
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

SPECIAL NOTES FOR UTILITY CLEARANCE
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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

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 9/12/2014

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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 contractors 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. 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, 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 one or more utility agreements with each affected utility owner 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. A utility agreement may address more than one utility adjustment for the same utility owner. 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, or use a similar document approved by KYTC. 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 Manager (UM) and 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. Please see the reference documents for a copy of an example agreement.
- 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 or has been in the process of acquiring utility easements needed for this project. At the time of this publication, some easements had not been acquired. The unacquired easements are as follows:

- a. Section 1: 65, 67 and 68
- b. Section 2: 105

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 the 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 at 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.

1.5.2.1 Utility Companies

The status of Kentucky 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. LG&E has designed and purchased the materials for this relocation and will perform the work starting in the month of October 2014. The estimated cost of this work is \$516,457.00. KYTC has a Keep Cost Agreement for this work. Other issues to be considered include:

- A. Equipment clearances / work clearances from the transmission lines must be adhered to in accordance with LG&E requirements and industry protection guidelines.
- B. 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.
- C. 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 (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.

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.

KYTC and the City of Shepherdsville has an agreement for this work.

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. 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 has an agreement for the relocation of the distribution and installation of the transmission and distribution 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. Plans provided are for “Information Purposes Only”. The extent of communication facility relocations is pending final plans provided by the Time Warner.

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 extend of the Windstream contractors abilities. This work shall be provided by the contractor. Plans provided are for “Information Purposes Only”. The extent of communication facility relocations is pending final plans provided by the Windstream.

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. Plans provided are for “Information Purposes Only”. The extent of communication facility relocations is pending final plans provided by the BCS.

Table 1-1 – Kentucky Utility Companies

KENTUCKY 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	Forrest Antique	4701 Commerce Crossings Dr. Louisville, KY 40229	502-817-6519 Cell/502-357-4724	Forrest.Antique@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

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 $\frac{3}{4}$ 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. Sheet piling and Bracing

1. Furnish, put in place and maintain such sheet piling 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 sheet piling, 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 sheet piling outside the neat lines of the foundation, unless indicated otherwise, to the extent deemed desirable for the method of operation. Sheet piling shall be plumb and securely braced and tied in position. Sheet piling 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 sheet piling 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 sheet piling and bracing. The sheet piling 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 sheet piling 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 sheet piling and bracing be cut off at any specified elevation. Sheet piling 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 ¾ 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>

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 – $\frac{3}{4}$ " 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 $\frac{1}{2}$ inch per length of pipe.
- I. All ID obstructions (bead welds, slags, etc.) shall not extend more than $\frac{3}{32}$ " 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 ¼-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 ¼-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-gear 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 $\frac{3}{4}$ 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. Sheet piling and Bracing

1. Furnish, put in place and maintain such sheet piling 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 sheet piling, 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 sheet piling outside the neat lines of the foundation, unless indicated otherwise, to the extent deemed desirable for the method of operation. Sheet piling shall be plumb and securely braced and tied in position. Sheet piling 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 sheet piling 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 sheet piling and bracing. The sheet piling 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 sheet piling 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 sheet piling and bracing be cut off at any specified elevation. Sheet piling 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 ¾ 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>

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 – $\frac{3}{4}$ " 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 $\frac{1}{2}$ inch per length of pipe.
- I. All ID obstructions (bead welds, slags, etc.) shall not extend more than $\frac{3}{32}$ " 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 ¼-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 ¼-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-gear 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

KYTC BMP Plan for Contract ID 141275



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 141275

Six Year Plan 2014

KYTC BMP Plan for Contract ID 141275

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): (2)
9. Projected completion date: (2)

KYTC BMP Plan for Contract ID 141275

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 141275

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 141275

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 141275

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 141275

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 141275

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 141275

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 from 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 141275

_____ 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 141275

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 141275

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:

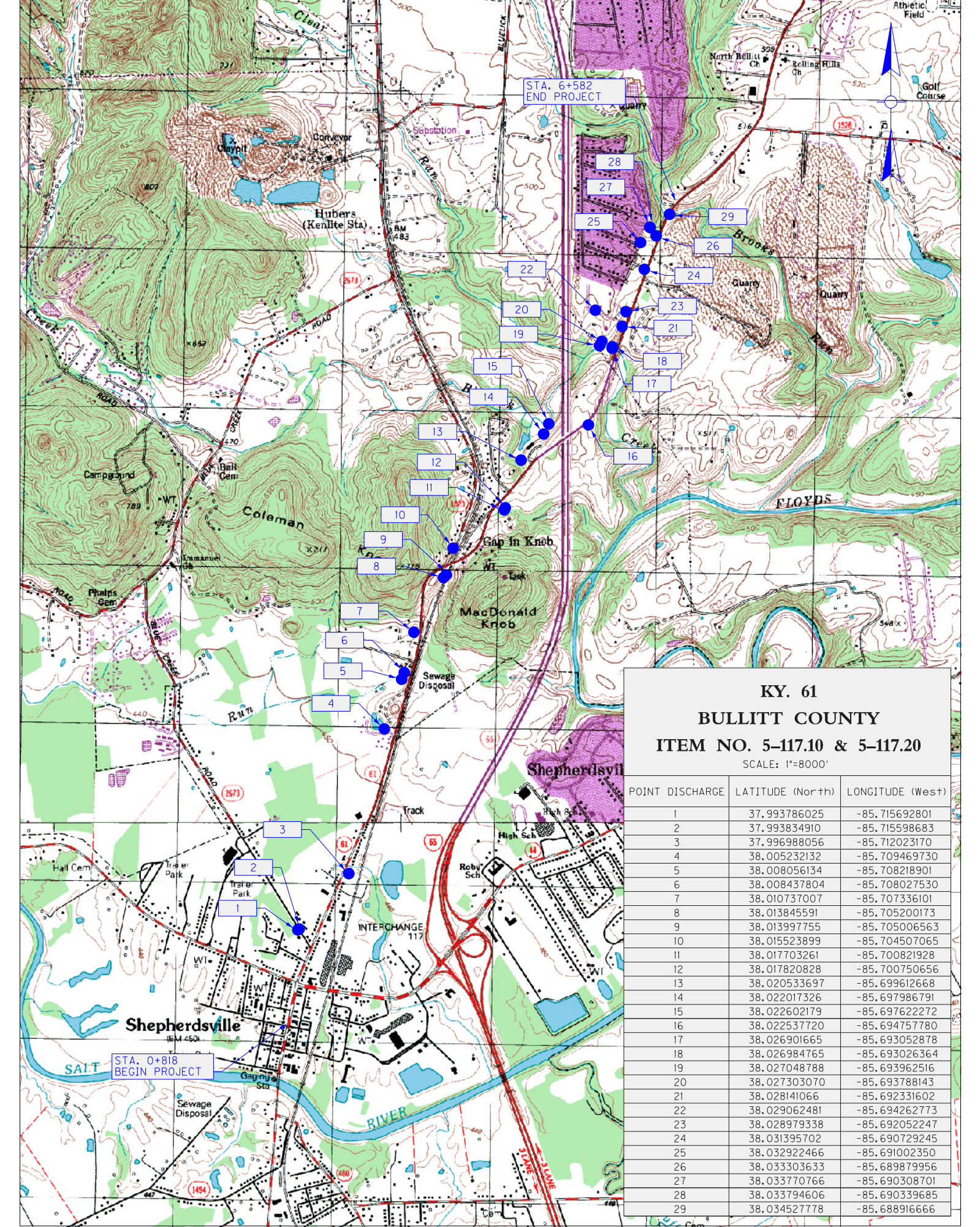
Phone:

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 name¹ 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.





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", with a long horizontal flourish extending to the right.

Shawn Hokanson
Surface Water Permits Branch
Division of Water

KENTUCKY TRANSPORTATION CABINET
COMMUNICATING ALL PROMISES (CAP)
ACTIVE

11 SEP 2014

Item No.	5 - 117.1	Project Mgr.	kytc\Paul.Davis
		County	BULLITT
		Route	KY-61
CAP #	Date of Promise	Promise made to:	Location of Promise
1	12-MAR-05	1	Trustees of Mount Zion Baptist Church of Shepherdsville
CAP Description			
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 Baptist Church of Shepherdsville	Parcel 21
CAP Description			
VOID CAP #1			
3	12-MAR-05	Trustees of Mount Zion Baptist Church of Shepherdsville	Parcel 21
CAP Description			
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
CAP Description			
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
CAP Description			
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
CAP Description			
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
CAP Description			
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
CAP Description			
THE FRONT PORCH SHALL NOT BE DISTURBED.			

SYP8162
11 SEP 2014

<u>Item No.</u>	5 - 117.2			<u>Project Mgr.</u>	kytc\Paul.Davis	
			<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	05-OCT-09	SP II, LLC	Parcels 102, 112, 119			
<u>CAP Description</u>						
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			
<u>CAP Description</u>						
VOID CAP #1. PLANS HAVE BEEN UPDATED TO REFLECT ALL OF THE RECENT DISCUSSIONS WITH THE PROPERTY OWNER.						

MATERIAL SUMMARY

CONTRACT ID: 141275

121GR14D075-FD04

DE01500611475

PRESTON HIGHWAY (KY 61) KY-61 BEGINS SOUTH OF KY-44 AND ENDS NORTH OF THE NEWLY CONSTRUCTED CONESTOGA PARKWAY GRADE & DRAIN AND PAVEMENT ALTERNATES, A DISTANCE OF 2.2 MILES.

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0001	00003	CRUSHED STONE BASE	38,786.00	TON
0002	00003	CRUSHED STONE BASE	25,946.00	TON
0003	00013	LIME STABILIZED ROADBED	84,715.00	SQYD
0004	00013	LIME STABILIZED ROADBED	84,715.00	SQYD
0005	00014	LIME	1,603.00	TON
0006	00014	LIME	1,603.00	TON
0007	00018	DRAINAGE BLANKET-TYPE II-ASPH	15,024.00	TON
0008	00018	DRAINAGE BLANKET-TYPE II-ASPH	13,562.00	TON
0009	00100	ASPHALT SEAL AGGREGATE	83.00	TON
0010	00100	ASPHALT SEAL AGGREGATE	83.00	TON
0011	00103	ASPHALT SEAL COAT	10.00	TON
0012	00103	ASPHALT SEAL COAT	10.00	TON
0013	00212	CL2 ASPH BASE 1.00D PG64-22	5,079.00	TON
0014	00212	CL2 ASPH BASE 1.00D PG64-22	5,079.00	TON
0015	00214	CL3 ASPH BASE 1.00D PG64-22	41,662.00	TON
0016	00214	CL3 ASPH BASE 1.00D PG64-22	1,500.00	TON
0017	00301	CL2 ASPH SURF 0.38D PG64-22	1,701.00	TON
0018	00301	CL2 ASPH SURF 0.38D PG64-22	1,701.00	TON
0019	00336	CL3 ASPH SURF 0.38A PG76-22	5,021.00	TON
0020	00336	CL3 ASPH SURF 0.38A PG76-22	650.00	TON
0021	00358	ASPHALT CURING SEAL	85.00	TON
0022	00358	ASPHALT CURING SEAL	85.00	TON
0023	02702	SAND FOR BLOTTER	212.00	TON
0024	02702	SAND FOR BLOTTER	212.00	TON
0025	10203ND	PAVEMENT ADJUSTMENT - (ASPHALT, 5-117.10)	1.00	LS
0026	02073	JPC PAVEMENT-9 IN	67,268.00	SQYD
0027	02075	JPC PAVEMENT-6 IN	7,777.00	SQYD
0028	10203ND	PAVEMENT ADJUSTMENT - (CONCRETE, 5-117.10)	1.00	LS
0029	00078	CRUSHED AGGREGATE SIZE NO 2	14.30	TON
0030	01000	PERFORATED PIPE-4 IN	21,048.00	LF
0031	01010	NON-PERFORATED PIPE-4 IN	187.00	LF
0032	01015	INSPECT & CERTIFY EDGE DRAIN SYSTEM - (5-117.10)	1.00	LS
0033	01020	PERF PIPE HEADWALL TY 1-4 IN	3.00	EACH
0034	01024	PERF PIPE HEADWALL TY 2-4 IN	1.00	EACH
0035	01028	PERF PIPE HEADWALL TY 3-4 IN	1.00	EACH
0036	01032	PERF PIPE HEADWALL TY 4-4 IN	7.00	EACH
0037	01310	REMOVE PIPE	2,633.00	LF
0038	01584	CAP DROP BOX INLET	1.00	EACH
0039	01706	REMOVE CATCH BASIN	27.00	EACH
0040	01740	CORED HOLE DRAINAGE BOX CON-4 IN	141.00	EACH
0041	01786	FILL AND CAP MANHOLE	6.00	EACH
0042	01787	REMOVE MANHOLE	5.00	EACH
0043	01792	ADJUST MANHOLE	13.00	EACH

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0044	01810	STANDARD CURB AND GUTTER	7,871.00	LF
0045	01811	STANDARD CURB AND GUTTER MOD	5,395.00	LF
0046	01845	ISLAND INTEGRAL CURB	121.00	LF
0047	01875	STANDARD HEADER CURB	1,105.00	LF
0048	01897	ASPHALT WEDGE CURB	55.00	LF
0049	01982	DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	47.00	EACH
0050	01983	DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL YELLOW	12.00	EACH
0051	01984	DELINEATOR FOR BARRIER - WHITE	48.00	EACH
0052	02003	RELOCATE TEMP CONC BARRIER	11,985.00	LF
0053	02014	BARRICADE-TYPE III	24.00	EACH
0054	02091	REMOVE PAVEMENT	879.00	SQYD
0055	02101	CEM CONC ENT PAVEMENT-8 IN	2,270.00	SQYD
0056	02159	TEMP DITCH	11,152.00	LF
0057	02200	ROADWAY EXCAVATION	218,054.00	CUYD
0058	02223	GRANULAR EMBANKMENT	6,065.00	CUYD
0059	02242	WATER - (FOR DUST CONTROL)	6.00	MGAL
0060	02262	FENCE-WOVEN WIRE TYPE 1	4,003.00	LF
0061	02351	GUARDRAIL-STEEL W BEAM-S FACE	3,994.00	LF
0062	02352	GUARDRAIL-STEEL W BEAM-D FACE	275.00	LF
0063	02360	GUARDRAIL TERMINAL SECTION NO 1	7.00	EACH
0064	02363	GUARDRAIL CONNECTOR TO BRIDGE END TY A	4.00	EACH
0065	02365	CRASH CUSHION TYPE IX-A	2.00	EACH
0066	02367	GUARDRAIL END TREATMENT TYPE 1	3.00	EACH
0067	02369	GUARDRAIL END TREATMENT TYPE 2A	7.00	EACH
0068	02381	REMOVE GUARDRAIL	2,187.00	LF
0069	02387	GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	4.00	EACH
0070	02397	TEMP GUARDRAIL	89.00	LF
0071	02429	RIGHT-OF-WAY MONUMENT TYPE 1	67.00	EACH
0072	02430	RIGHT-OF-WAY MONUMENT TYPE 1A	11.00	EACH
0073	02432	WITNESS POST	20.00	EACH
0074	02483	CHANNEL LINING CLASS II	4,102.00	TON
0075	02484	CHANNEL LINING CLASS III	3,200.00	TON
0076	02545	CLEARING AND GRUBBING - (APPROXIMATELY 41.521 ACRES)	1.00	LS
0077	02555	CONCRETE-CLASS B	226.00	CUYD
0078	02562	TEMPORARY SIGNS	1,615.00	SQFT
0079	02585	EDGE KEY	195.00	LF
0080	02596	FABRIC-GEOTEXTILE TYPE I	9,619.00	SQYD
0081	02599	FABRIC-GEOTEXTILE TYPE IV	121,685.00	SQYD
0082	02625	REMOVE HEADWALL	15.00	EACH
0083	02650	MAINTAIN & CONTROL TRAFFIC - (5-117.10)	1.00	LS
0084	02651	DIVERSIONS (BY-PASS DETOURS) - (A: STA. 3+305.000, MAINLINE KY 61)	1.00	LS
0085	02651	DIVERSIONS (BY-PASS DETOURS) - (B: STA. 0+000.000, MAINLINE KY 61)	1.00	LS
0086	02651	DIVERSIONS (BY-PASS DETOURS) - (CRR DIVERSION, STA. 4+947.527, CORAL RIDGE ROAD)	1.00	LS
0087	02651	DIVERSIONS (BY-PASS DETOURS) - (NS DIVERSION STA. 0+000.000, NORTH SIDE AVENUE)	1.00	LS

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0088	02651	DIVERSIONS (BY-PASS DETOURS) - (POINTE DIVERSION STA. 0+000.000, POINTE BOULEVARD)	1.00	LS
0089	02671	PORTABLE CHANGEABLE MESSAGE SIGN	4.00	EACH
0090	02676	MOBILIZATION FOR MILL & TEXT - (5-117.10)	1.00	LS
0091	02677	ASPHALT PAVE MILLING & TEXTURING	442.00	TON
0092	02690	SAFELOADING	224.00	CUYD
0093	02696	SHOULDER RUMBLE STRIPS-SAWED	8,426.00	LF
0094	02701	TEMP SILT FENCE	11,152.00	LF
0095	02703	SILT TRAP TYPE A	34.00	EACH
0096	02704	SILT TRAP TYPE B	34.00	EACH
0097	02705	SILT TRAP TYPE C	34.00	EACH
0098	02706	CLEAN SILT TRAP TYPE A	68.00	EACH
0099	02707	CLEAN SILT TRAP TYPE B	68.00	EACH
0100	02708	CLEAN SILT TRAP TYPE C	68.00	EACH
0101	02709	CLEAN TEMP SILT FENCE	22,303.00	LF
0102	02720	SIDEWALK-4 IN CONCRETE	6,775.00	SQYD
0103	02726	STAKING - (5-117.10)	1.00	LS
0104	02731	REMOVE STRUCTURE - (CSX BRIDGE)	1.00	LS
0105	02731	REMOVE STRUCTURE - (CULVERT)	1.00	LS
0106	02775	ARROW PANEL	2.00	EACH
0107	02898	RELOCATE CRASH CUSHION	58.00	EACH
0108	03171	CONCRETE BARRIER WALL TYPE 9T	2,536.00	LF
0109	03225	TUBULAR MARKERS	88.00	EACH
0110	05950	EROSION CONTROL BLANKET	1,803.00	SQYD
0111	05952	TEMP MULCH	200,961.00	SQYD
0112	05953	TEMP SEEDING AND PROTECTION	200,961.00	SQYD
0113	05963	INITIAL FERTILIZER	5.00	TON
0114	05964	20-10-10 FERTILIZER	9.00	TON
0115	05985	SEEDING AND PROTECTION	153,314.00	SQYD
0116	05989	SPECIAL SEEDING CROWN VETCH	14,843.00	SQYD
0117	05992	AGRICULTURAL LIMESTONE	105.00	TON
0118	06510	PAVE STRIPING-TEMP PAINT-4 IN	82,884.00	LF
0119	06514	PAVE STRIPING-PERM PAINT-4 IN	94,019.00	LF
0120	06550	PAVE STRIPING-TEMP REM TAPE-W	21,653.00	LF
0121	06551	PAVE STRIPING-TEMP REM TAPE-Y	21,653.00	LF
0122	06565	PAVE MARKING-THERMO X-WALK-6 IN	843.00	LF
0123	06568	PAVE MARKING-THERMO STOP BAR-24IN	223.00	LF
0124	06569	PAVE MARKING-THERMO CROSS-HATCH	1,012.00	SQFT
0125	06574	PAVE MARKING-THERMO CURV ARROW	40.00	EACH
0126	06588	PAVEMENT MARKER TY IVA-BY TEMP	543.00	EACH
0127	08001	STRUCTURE EXCAVATION-COMMON	75.00	CUYD
0128	08100	CONCRETE-CLASS A	4.00	CUYD
0129	08903	CRASH CUSHION TY VI CLASS BT TL3	10.00	EACH
0130	20259ED	TEMPORARY MEDIAN CROSSOVER	2.00	EACH
0131	20424EC	CONNECT TO EXIST MANHOLE	1.00	EACH
0132	20914ED	ROLLED CURB AND GUTTER	146.00	LF
0133	21342ED	FORM LINER - (COBBLESTONE)	1,502.00	SQFT
0134	23131ER701	PIPELINE VIDEO INSPECTION	9,088.00	LF
0135	23158ES505	DETECTABLE WARNINGS	1,299.00	SQFT
0136	23274EN11F	TURF REINFORCEMENT MAT 1	7,816.00	SQYD

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0137	24721EC	CHEMICAL TESTING EQUIPMENT - (X-RAY)	1.00	LS
0138	00440	ENTRANCE PIPE-15 IN	128.00	LF
0139	00443	ENTRANCE PIPE-24 IN	56.00	LF
0140	00462	CULVERT PIPE-18 IN	161.00	LF
0141	00466	CULVERT PIPE-30 IN	169.00	LF
0142	00468	CULVERT PIPE-36 IN	64.00	LF
0143	00521	STORM SEWER PIPE-15 IN	6,440.00	LF
0144	00522	STORM SEWER PIPE-18 IN	2,396.00	LF
0145	00524	STORM SEWER PIPE-24 IN	3,537.00	LF
0146	00525	STORM SEWER PIPE-27 IN	115.00	LF
0147	00526	STORM SEWER PIPE-30 IN	905.00	LF
0148	00528	STORM SEWER PIPE-36 IN	108.00	LF
0149	00530	STORM SEWER PIPE-48 IN	128.00	LF
0150	00556	STORM SEWER PIPE-30 IN EQUIV	3,644.00	LF
0151	01204	PIPE CULVERT HEADWALL-18 IN	3.00	EACH
0152	01210	PIPE CULVERT HEADWALL-30 IN	1.00	EACH
0153	01212	PIPE CULVERT HEADWALL-36 IN	1.00	EACH
0154	01390	METAL END SECTION TY 3-15 IN	15.00	EACH
0155	01391	METAL END SECTION TY 3-18 IN	6.00	EACH
0156	01393	METAL END SECTION TY 3-24 IN	3.00	EACH
0157	01394	METAL END SECTION TY 3-30 IN	3.00	EACH
0158	01395	METAL END SECTION TY 3-36 IN	3.00	EACH
0159	01397	METAL END SECTION TY 3-48 IN	1.00	EACH
0160	01456	CURB BOX INLET TYPE A	127.00	EACH
0161	01480	CURB BOX INLET TYPE B	8.00	EACH
0162	01487	CURB BOX INLET TYPE F	3.00	EACH
0163	01490	DROP BOX INLET TYPE 1	4.00	EACH
0164	01496	DROP BOX INLET TYPE 3	9.00	EACH
0165	01517	DROP BOX INLET TYPE 5F	4.00	EACH
0166	01538	DROP BOX INLET TYPE 7	1.00	EACH
0167	01544	DROP BOX INLET TYPE 11	1.00	EACH
0168	01559	DROP BOX INLET TYPE 13G	11.00	EACH
0169	01568	DROP BOX INLET TYPE 13S	2.00	EACH
0170	01577	DROP BOX INLET TYPE 14	2.00	EACH
0171	01642	JUNCTION BOX-18 IN	1.00	EACH
0172	01643	JUNCTION BOX-24 IN	1.00	EACH
0173	01645	JUNCTION BOX-36 IN	1.00	EACH
0174	01767	MANHOLE TYPE C	3.00	EACH
0175	01789	RECONSTRUCT MANHOLE	1.00	EACH
0176	02600	FABRIC GEOTEXTILE TY IV FOR PIPE	28,033.00	SQYD
0177	08100	CONCRETE-CLASS A	1,696.00	CUYD
0178	08100	CONCRETE-CLASS A	83.80	CUYD
0179	08104	CONCRETE-CLASS AA	1,297.70	CUYD
0180	08150	STEEL REINFORCEMENT	280,575.00	LB
0181	08150	STEEL REINFORCEMENT	12,082.00	LB
0182	08151	STEEL REINFORCEMENT-EPOXY COATED	344,535.00	LB
0183	08002	STRUCTURE EXCAV-SOLID ROCK	3,083.00	CUYD
0184	02231	STRUCTURE GRANULAR BACKFILL	944.00	CUYD
0185	08046	PILES-STEEL HP12X53	1,040.00	LF
0186	08033	TEST PILES	43.00	LF

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0187	08094	PILE POINTS-12 IN	67.00	EACH
0188	08635	PRECAST PC I BEAM TYPE 6	4,282.10	LF
0189	21532ED	RAIL SYSTEM TYPE III	1,472.00	LF
0190	03299	ARMORED EDGE FOR CONCRETE	453.00	LF
0191	02998	MASONRY COATING	4,613.00	SQYD
0192	08003	FOUNDATION PREPARATION - (CSX BRIDGE)	1.00	LS
0193	08003	FOUNDATION PREPARATION - (CULVERT, 24614)	1.00	LS
0194	23964EC	PROTECTIVE FENCE	1,472.00	LF
0195	08039	PRE-DRILLING FOR PILES	164.00	LF
0196	24725EC	UTILITY RELOCATION - (LG&E-ELECTRIC, 5-117.10)	1.00	LS
0197	24725EC	UTILITY RELOCATION - (LG&E-GAS, 5-117.10)	1.00	LS
0198	24725EC	UTILITY RELOCATION - (WINDSTREAM, 5-117.10)	1.00	LS
0199	24725EC	UTILITY RELOCATION - (TIME WARNER CABLE, 5-117.10)	1.00	LS
0200	24725EC	UTILITY RELOCATION - (BULLITT CO. SCHOOLS)	1.00	LS
0201	01069	STEEL ENCASEMENT PIPE-12 IN - (OPEN CUT-WINDSTREAM: BLUE LICK ROAD)	70.00	LF
0202	01055	SEWER PIPE-15 IN - (PVC, GRAVITY, OPEN CUT)	334.00	LF
0203	22986NN	TIE NEW 15 IN PVC SEWER TO EXIST MANHOLE	2.00	EACH
0204	21382ND	CUT AND PLUG-8 IN - (PVC)	2.00	EACH
0205	06406	SBM ALUM SHEET SIGNS .080 IN	437.00	SQFT
0206	06407	SBM ALUM SHEET SIGNS .125 IN	56.00	SQFT
0207	06410	STEEL POST TYPE 1	969.00	LF
0208	06412	STEEL POST MILE MARKERS	6.00	EACH
0209	20418ED	REMOVE & RELOCATE SIGNS	1.00	EACH
0210	24631EC	BARCODE SIGN INVENTORY	100.00	EACH
0211	04792	CONDUIT-1 IN	70.00	LF
0212	04793	CONDUIT-1 1/4 IN	230.00	LF
0213	04795	CONDUIT-2 IN	160.00	LF
0214	04811	ELECTRICAL JUNCTION BOX TYPE B	5.00	EACH
0215	04820	TRENCHING AND BACKFILLING	460.00	LF
0216	04830	LOOP WIRE	3,743.00	LF
0217	04844	CABLE-NO. 14/5C	3,466.00	LF
0218	04850	CABLE-NO. 14/1 PAIR	2,288.00	LF
0219	04885	MESSENGER-10800 LB	900.00	LF
0220	04895	LOOP SAW SLOT AND FILL	1,436.00	LF
0221	04931	INSTALL CONTROLLER TYPE 170	2.00	EACH
0222	04932	INSTALL STEEL STRAIN POLE	8.00	EACH
0223	04950	REMOVE SIGNAL EQUIPMENT	1.00	EACH
0224	20093NS835	INSTALL PEDESTRIAN HEAD-LED	12.00	EACH
0225	20094ES835	TEMP RELOCATION OF SIGNAL HEAD	38.00	EACH
0226	20188NS835	INSTALL LED SIGNAL-3 SECTION	19.00	EACH
0227	21743NN	INSTALL PEDESTRIAN DETECTOR	12.00	EACH
0228	23157EN	TRAFFIC SIGNAL POLE BASE	35.00	CUYD
0229	23222EC	INSTALL SIGNAL PEDESTAL	4.00	EACH
0230	23982EC	INSTALL ANTENNA	2.00	EACH
0231	01093	DUCTILE IRON PIPE-6 IN - (150 MM)	56.00	LF
0232	01095	DUCTILE IRON PIPE-8 IN - (200 MM)	125.00	LF
0233	01099	DUCTILE IRON PIPE-12 IN - (300 MM)	3,737.00	LF
0234	01103	DUCTILE IRON PIPE-16 IN - (400 MM)	2,316.00	LF

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0235	01111	DUCTILE IRON PIPE-24 IN - (600 MM WITH NITRILE GASKETS)	394.00	LF
0236	01111	DUCTILE IRON PIPE-24 IN - (600 MM)	9,403.00	LF
0237	03539	BEND 11.25 DEG 8 IN - (200 MM)	1.00	EACH
0238	03543	BEND 11.25 DEG 16 IN - (400 MM)	3.00	EACH
0239	24012EC	BEND 11.25 DEG-24 IN - (600 MM)	5.00	EACH
0240	03546	BEND 22.50 DEG 8 IN - (200 MM)	1.00	EACH
0241	03548	BEND 22.50 DEG 12 IN - (300 MM)	3.00	EACH
0242	03552	BEND 22.50 DEG 16 IN - (400 MM)	5.00	EACH
0243	24011EC	BEND 22.5 DEG-24 IN - (600 MM)	1.00	EACH
0244	03554	BEND 45 DEG 6 IN - (150 MM)	4.00	EACH
0245	03563	BEND 45 DEG 8 IN - (200 MM)	3.00	EACH
0246	03556	BEND 45 DEG 12 IN - (300 MM)	9.00	EACH
0247	03558	BEND 45 DEG 16 IN - (400 MM)	8.00	EACH
0248	22191NN	BEND 45 DEG-24 IN - (600 MM)	6.00	EACH
0249	03526	GATE VALVE-6 IN - (150 MM, MJ)	4.00	EACH
0250	03528	GATE VALVE-8 IN - (200 MM, MJ)	3.00	EACH
0251	03532	GATE VALVE-12 IN - (300 MM, MJ)	18.00	EACH
0252	03536	GATE VALVE-16 IN - (400 MM, MJ)	2.00	EACH
0253	23194EC	GATE VALVE-24 IN - (600 MJ)	5.00	EACH
0254	24723EC	PRESSURE PLANE VALVE - (16 IN / 400 MM)	1.00	EACH
0255	20822ED	TEE 12 IN X 6 IN - (300 MM X 150 MM)	2.00	EACH
0256	21094ND	TEE 12 IN X 8 IN - (300 MM X 200 MM)	2.00	EACH
0257	20821ND	TEE 12 IN X 12 IN - (300 MM X 300 MM)	6.00	EACH
0258	23997EC	TEE-16 X 6 IN - (400 MM X 150 MM)	2.00	EACH
0259	23200EC	TEE-16 IN X 8 IN - (400 MM X 200 MM)	1.00	EACH
0260	23201EC	TEE-16 IN X 16 IN - (400 MM X 400 MM)	2.00	EACH
0261	24486ED	TEE - (24 IN X 12 IN / 600 MM X 300 MM)	2.00	EACH
0262	23202EC	TEE-24 IN X 16 IN - (600 MM X 400 MM)	1.00	EACH
0263	24486ED	TEE - (24 IN X 24 IN / 600 MM X 600 MM)	2.00	EACH
0264	24700EC	DUCTILE IRON CROSS - (12 IN X 12 IN / 300 MM X 300 MM)	1.00	EACH
0265	24700EC	DUCTILE IRON CROSS - (24 IN X 24 IN / 600 MM X 600 MM)	1.00	EACH
0266	24700EC	DUCTILE IRON CROSS - (16 IN X 16 IN / 400 MM X 400 MM)	1.00	EACH
0267	20056NN	REDUCER - (24 IN X 12 IN / 600 MM X 300 MM)	1.00	EACH
0268	24724EC	PLUG-16 IN - (400 MM)	1.00	EACH
0269	23197EC	PLUG-24 IN - (600 MM)	3.00	EACH
0270	23493EC	AIR RELEASE VALVE-2 IN - (50 MM)	3.00	EACH
0271	03466	TIE-IN 6 IN - (150 MM)	2.00	EACH
0272	03468	TIE-IN 8 IN - (200 MM)	3.00	EACH
0273	03472	TIE-IN 12 IN - (300 MM)	8.00	EACH
0274	21113ND	TIE-IN 16 IN - (400 MM)	9.00	EACH
0275	03474	TIE-IN 24 IN - (600 MM)	1.00	EACH
0276	23699EC	STEEL ENCASEMENT PIPE-30 IN - (760 MM)	262.00	LF
0277	23700EC	STEEL ENCASEMENT PIPE-42 IN - (1060 MM)	79.00	LF
0278	01315	BLOW-OFF ASSEMBLY - (2 IN / 50 MM)	1.00	EACH
0279	21114ND	CUT AND PLUG 6 IN - (150 MM)	2.00	EACH
0280	21382ND	CUT AND PLUG-8 IN - (200 MM)	3.00	EACH
0281	20708ND	CUT AND PLUG 12 IN - (300 MM)	8.00	EACH

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0282	20707ND	CUT AND PLUG 16 IN - (400 MM)	9.00	EACH
0283	20154ND	DRAIN ASSEMBLY - (8 IN / 200 MM)	4.00	EACH
0284	23363EC	LEAK DETECTION ASSEMBLY - (WITH GATE VALVE, 24 IN / 600 MM)	1.00	EACH
0285	03433	RELOCATE FIRE HYDRANT - (6 IN / 150 MM)	11.00	EACH
0286	20349NC	RELOCATE FIRE SERVICE LINE	1.00	EACH
0287	03431	RELOCATE WATER METER	45.00	EACH
0288	21109ND	RELOCATE SERVICE	45.00	EACH
0289	02568	MOBILIZATION	1.00	LS
0290	02569	DEMOBILIZATION	1.00	LS

CONTRACT ID: 141275

121GR14D075-FD04

DE01500611476

PRESTON HIGHWAY (KY 61) KY-61 BEGINS NORTH OF THE CONESTOGA PARKWAY AND ENDS AT EXISTING KY-61 SOUTH OF BROOKS RUN CREEK GRADE & DRAIN AND PAVEMENT ALTERNATES, A DISTANCE OF 1.3 MILES.

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0291	00003	CRUSHED STONE BASE	54,642.00	TON
0292	00003	CRUSHED STONE BASE	53,440.00	TON
0293	00013	LIME STABILIZED ROADBED	18,203.00	SQYD
0294	00013	LIME STABILIZED ROADBED	18,203.00	SQYD
0295	00014	LIME	344.00	TON
0296	00014	LIME	344.00	TON
0297	00018	DRAINAGE BLANKET-TYPE II-ASPH	3,180.00	TON
0298	00018	DRAINAGE BLANKET-TYPE II-ASPH	2,980.00	TON
0299	00100	ASPHALT SEAL AGGREGATE	245.00	TON
0300	00100	ASPHALT SEAL AGGREGATE	245.00	TON
0301	00103	ASPHALT SEAL COAT	30.00	TON
0302	00103	ASPHALT SEAL COAT	30.00	TON
0303	00212	CL2 ASPH BASE 1.00D PG64-22	8,071.00	TON
0304	00212	CL2 ASPH BASE 1.00D PG64-22	8,071.00	TON
0305	00214	CL3 ASPH BASE 1.00D PG64-22	24,607.00	TON
0306	00301	CL2 ASPH SURF 0.38D PG64-22	2,915.00	TON
0307	00301	CL2 ASPH SURF 0.38D PG64-22	2,805.00	TON
0308	00336	CL3 ASPH SURF 0.38A PG76-22	981.00	TON
0309	00358	ASPHALT CURING SEAL	19.00	TON
0310	00358	ASPHALT CURING SEAL	19.00	TON
0311	00388	CL3 ASPH SURF 0.38B PG64-22	2,002.00	TON
0312	02702	SAND FOR BLOTTER	45.00	TON
0313	02702	SAND FOR BLOTTER	45.00	TON
0314	10203ND	PAVEMENT ADJUSTMENT - (ASPHALT, 5-117.20)	1.00	LS
0315	02073	JPC PAVEMENT-9 IN	45,909.00	SQYD
0316	02075	JPC PAVEMENT-6 IN	22,024.00	SQYD
0317	10203ND	PAVEMENT ADJUSTMENT - (CONCRETE, 5-117.20)	1.00	LS
0318	00078	CRUSHED AGGREGATE SIZE NO 2	14.30	TON
0319	01000	PERFORATED PIPE-4 IN	5,278.50	LF
0320	01010	NON-PERFORATED PIPE-4 IN	238.50	LF

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0321	01015	INSPECT & CERTIFY EDGE DRAIN SYSTEM - (5-117.20)	1.00	LS
0322	01020	PERF PIPE HEADWALL TY 1-4 IN	2.00	EACH
0323	01032	PERF PIPE HEADWALL TY 4-4 IN	6.00	EACH
0324	01310	REMOVE PIPE	31.00	LF
0325	01740	CORED HOLE DRAINAGE BOX CON-4 IN	7.00	EACH
0326	01845	ISLAND INTEGRAL CURB	149.50	LF
0327	01982	DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	92.00	EACH
0328	01983	DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL YELLOW	24.00	EACH
0329	01987	DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	26.00	EACH
0330	01990	DELINEATOR FOR BARRIER WALL-B/W	5.00	EACH
0331	02014	BARRICADE-TYPE III	24.00	EACH
0332	02091	REMOVE PAVEMENT	836.10	SQYD
0333	02159	TEMP DITCH	12,520.00	LF
0334	02200	ROADWAY EXCAVATION	132,885.00	CUYD
0335	02223	GRANULAR EMBANKMENT	6,065.00	CUYD
0336	02242	WATER	4.40	MGAL
0337	02262	FENCE-WOVEN WIRE TYPE 1	11,467.00	LF
0338	02351	GUARDRAIL-STEEL W BEAM-S FACE	6,162.50	LF
0339	02352	GUARDRAIL-STEEL W BEAM-D FACE	550.00	LF
0340	02360	GUARDRAIL TERMINAL SECTION NO 1	4.00	EACH
0341	02363	GUARDRAIL CONNECTOR TO BRIDGE END TY A	8.00	EACH
0342	02365	CRASH CUSHION TYPE IX-A	4.00	EACH
0343	02367	GUARDRAIL END TREATMENT TYPE 1	9.00	EACH
0344	02369	GUARDRAIL END TREATMENT TYPE 2A	15.00	EACH
0345	02381	REMOVE GUARDRAIL	1,548.40	LF
0346	02383	REMOVE & RESET GUARDRAIL	523.00	LF
0347	02387	GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	7.00	EACH
0348	02391	GUARDRAIL END TREATMENT TYPE 4A	1.00	EACH
0349	02397	TEMP GUARDRAIL	137.50	LF
0350	02429	RIGHT-OF-WAY MONUMENT TYPE 1	52.00	EACH
0351	02432	WITNESS POST	13.00	EACH
0352	02483	CHANNEL LINING CLASS II	1,309.00	TON
0353	02484	CHANNEL LINING CLASS III	2,180.00	TON
0354	02545	CLEARING AND GRUBBING - (APPROXIMATELY 56.745 ACRES)	1.00	LS
0355	02555	CONCRETE-CLASS B	101.00	CUYD
0356	02562	TEMPORARY SIGNS	1,076.00	SQFT
0357	02585	EDGE KEY	69.20	LF
0358	02596	FABRIC-GEOTEXTILE TYPE I	4,235.00	SQYD
0359	02599	FABRIC-GEOTEXTILE TYPE IV	149,222.00	SQYD
0360	02625	REMOVE HEADWALL	2.00	EACH
0361	02650	MAINTAIN & CONTROL TRAFFIC - (5-117.20)	1.00	LS
0362	02651	DIVERSIONS (BY-PASS DETOURS) - (KY 61 CONNECTOR)	1.00	LS
0363	02651	DIVERSIONS (BY-PASS DETOURS) - (BECNEL LANE, STA. 0+152.999 @ MAINLINE 5+834.523)	1.00	LS
0364	02651	DIVERSIONS (BY-PASS DETOURS) - (HILLBROOK DRIVE, STA. 5+000.000 @ MAINLINE 6+170.000)	1.00	LS
0365	02671	PORTABLE CHANGEABLE MESSAGE SIGN	2.00	EACH
0366	02690	SAFELOADING	3.00	CUYD

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0367	02696	SHOULDER RUMBLE STRIPS-SAWED	26,507.00	LF
0368	02701	TEMP SILT FENCE	12,520.00	LF
0369	02703	SILT TRAP TYPE A	47.00	EACH
0370	02704	SILT TRAP TYPE B	47.00	EACH
0371	02705	SILT TRAP TYPE C	47.00	EACH
0372	02706	CLEAN SILT TRAP TYPE A	94.00	EACH
0373	02707	CLEAN SILT TRAP TYPE B	94.00	EACH
0374	02708	CLEAN SILT TRAP TYPE C	94.00	EACH
0375	02709	CLEAN TEMP SILT FENCE	25,039.00	LF
0376	02726	STAKING - (5-117.20)	1.00	LS
0377	02775	ARROW PANEL	2.00	EACH
0378	03171	CONCRETE BARRIER WALL TYPE 9T	361.00	LF
0379	03225	TUBULAR MARKERS	110.00	EACH
0380	05950	EROSION CONTROL BLANKET	2,495.00	SQYD
0381	05952	TEMP MULCH	281,849.00	SQYD
0382	05953	TEMP SEEDING AND PROTECTION	281,849.00	SQYD
0383	05963	INITIAL FERTILIZER	87.00	TON
0384	05964	20-10-10 FERTILIZER	15.00	TON
0385	05985	SEEDING AND PROTECTION	260,283.00	SQYD
0386	05989	SPECIAL SEEDING CROWN VETCH	12,779.00	SQYD
0387	05992	AGRICULTURAL LIMESTONE	175.00	TON
0388	06510	PAVE STRIPING-TEMP PAINT-4 IN	44,268.00	LF
0389	06514	PAVE STRIPING-PERM PAINT-4 IN	62,923.00	LF
0390	06550	PAVE STRIPING-TEMP REM TAPE-W	10,804.00	LF
0391	06551	PAVE STRIPING-TEMP REM TAPE-Y	10,804.00	LF
0392	06569	PAVE MARKING-THERMO CROSS-HATCH	4,359.00	SQFT
0393	06574	PAVE MARKING-THERMO CURV ARROW	4.00	EACH
0394	06576	PAVE MARKING-THERMO ONLY	1.00	EACH
0395	06578	PAVE MARKING-THERMO MERGE ARROW	4.00	EACH
0396	06588	PAVEMENT MARKER TY IVA-BY TEMP	550.00	EACH
0397	08001	STRUCTURE EXCAVATION-COMMON	513.00	CUYD
0398	08002	STRUCTURE EXCAV-SOLID ROCK	53.00	CUYD
0399	08100	CONCRETE-CLASS A	4.30	CUYD
0400	08903	CRASH CUSHION TY VI CLASS BT TL3	1.00	EACH
0401	20259ED	TEMPORARY MEDIAN CROSSOVER	2.00	EACH
0402	20000ES724	TREE	28.00	EACH
0403	21342ED	FORM LINER - (COBBLESTONE)	1,169.00	SQFT
0404	23131ER701	PIPELINE VIDEO INSPECTION	2,674.00	LF
0405	23139EN	STRIPING REMOVAL	55,072.00	LF
0406	23274EN11F	TURF REINFORCEMENT MAT 1	20,981.00	SQYD
0407	24096EC	REMOVE AND RESET END TREATMENT	2.00	EACH
0408	00440	ENTRANCE PIPE-15 IN	303.00	LF
0409	00441	ENTRANCE PIPE-18 IN	136.00	LF
0410	00443	ENTRANCE PIPE-24 IN	62.00	LF
0411	00461	CULVERT PIPE-15 IN	52.00	LF
0412	00462	CULVERT PIPE-18 IN	815.00	LF
0413	00464	CULVERT PIPE-24 IN	171.00	LF
0414	00466	CULVERT PIPE-30 IN	235.00	LF
0415	00468	CULVERT PIPE-36 IN	69.00	LF
0416	00469	CULVERT PIPE-42 IN	230.00	LF

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0417	00470	CULVERT PIPE-48 IN	149.00	LF
0418	00498	CULVERT PIPE-42 IN EQUIV	41.00	LF
0419	00500	CULVERT PIPE-54 IN EQUIV	46.00	LF
0420	00522	STORM SEWER PIPE-18 IN	372.00	LF
0421	00526	STORM SEWER PIPE-30 IN	159.00	LF
0422	00528	STORM SEWER PIPE-36 IN	157.00	LF
0423	00560	STORM SEWER PIPE-48 IN EQUIV	118.00	LF
0424	01204	PIPE CULVERT HEADWALL-18 IN	6.00	EACH
0425	01210	PIPE CULVERT HEADWALL-30 IN	1.00	EACH
0426	01214	PIPE CULVERT HEADWALL-42 IN	3.00	EACH
0427	01215	PIPE CULVERT HEADWALL-42 IN EQUIV	1.00	EACH
0428	01216	PIPE CULVERT HEADWALL-48 IN	4.00	EACH
0429	01374	METAL END SECTION TY 1-30 IN	1.00	EACH
0430	01390	METAL END SECTION TY 3-15 IN	13.00	EACH
0431	01391	METAL END SECTION TY 3-18 IN	16.00	EACH
0432	01393	METAL END SECTION TY 3-24 IN	6.00	EACH
0433	01394	METAL END SECTION TY 3-30 IN	3.00	EACH
0434	01395	METAL END SECTION TY 3-36 IN	2.00	EACH
0435	01396	METAL END SECTION TY 3-42 IN	1.00	EACH
0436	01480	CURB BOX INLET TYPE B	5.00	EACH
0437	01490	DROP BOX INLET TYPE 1	3.00	EACH
0438	01496	DROP BOX INLET TYPE 3	1.00	EACH
0439	01499	DROP BOX INLET TYPE 4	3.00	EACH
0440	01514	DROP BOX INLET TYPE 5E	1.00	EACH
0441	01517	DROP BOX INLET TYPE 5F	9.00	EACH
0442	01538	DROP BOX INLET TYPE 7	2.00	EACH
0443	01585	REMOVE DROP BOX INLET	1.00	EACH
0444	01641	JUNCTION BOX-15 IN	1.00	EACH
0445	01643	JUNCTION BOX-24 IN	1.00	EACH
0446	01645	JUNCTION BOX-36 IN	1.00	EACH
0447	02600	FABRIC GEOTEXTILE TY IV FOR PIPE	5,427.00	SQYD
0448	21880NN	METAL END SECTION TY 3-42 IN EQUIV	1.00	EACH
0449	23048NN	METAL END SECTION TY 3-54 IN EQ	2.00	EACH
0450	08100	CONCRETE-CLASS A	132.70	CUYD
0451	08100	CONCRETE-CLASS A	476.90	CUYD
0452	08100	CONCRETE-CLASS A	218.60	CUYD
0453	08104	CONCRETE-CLASS AA	441.20	CUYD
0454	08104	CONCRETE-CLASS AA	589.90	CUYD
0455	08150	STEEL REINFORCEMENT	25,686.00	LB
0456	08150	STEEL REINFORCEMENT	76,519.00	LB
0457	08150	STEEL REINFORCEMENT	19,809.00	LB
0458	08151	STEEL REINFORCEMENT-EPOXY COATED	100,257.00	LB
0459	08151	STEEL REINFORCEMENT-EPOXY COATED	131,960.00	LB
0460	08003	FOUNDATION PREPARATION - (I-65 BRIDGE)	1.00	LS
0461	08003	FOUNDATION PREPARATION - (BLUE LICK CREEK)	1.00	LS
0462	08003	FOUNDATION PREPARATION - (CULVERT 24615)	1.00	LS
0463	02231	STRUCTURE GRANULAR BACKFILL	914.00	CUYD
0464	02231	STRUCTURE GRANULAR BACKFILL	156.00	CUYD
0465	08635	PRECAST PC I BEAM TYPE 6	1,262.50	LF
0466	08046	PILES-STEEL HP12X53	679.10	LF

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0467	08046	PILES-STEEL HP12X53	2,965.00	LF
0468	08033	TEST PILES	59.00	LF
0469	08033	TEST PILES	207.00	LF
0470	03299	ARMORED EDGE FOR CONCRETE	102.70	LF
0471	03299	ARMORED EDGE FOR CONCRETE	170.00	LF
0472	02998	MASONRY COATING	1,243.00	SQYD
0473	02998	MASONRY COATING	5,555.00	SQYD
0474	08094	PILE POINTS-12 IN	30.00	EACH
0475	08094	PILE POINTS-12 IN	114.00	EACH
0476	08269	ELECTRICAL CONDUIT - (APPROXIMATE LENGTH OF 512 FEET)	1.00	LS
0477	08018	RETAINING WALL	4,112.00	SQFT
0478	08002	STRUCTURE EXCAV-SOLID ROCK	75.00	CUYD
0479	08002	STRUCTURE EXCAV-SOLID ROCK	128.00	CUYD
0480	08002	STRUCTURE EXCAV-SOLID ROCK	233.10	CUYD
0481	02731	REMOVE STRUCTURE - (REMOVE EXISTING RETAINING WALL)	1.00	LS
0482	21532ED	RAIL SYSTEM TYPE III	511.50	LF
0483	21532ED	RAIL SYSTEM TYPE III	691.30	LF
0484	08019	CYCLOPEAN STONE RIP RAP	2,816.00	TON
0485	08633	PRECAST PC I BEAM TYPE 3	1,697.50	LF
0486	02596	FABRIC-GEOTEXTILE TYPE I	2,846.00	SQYD
0487	24725EC	UTILITY RELOCATION - (LG&E-ELECTRIC, 5-117.20)	1.00	LS
0488	24725EC	UTILITY RELOCATION - (LG&E-GAS, 5-117.20)	1.00	LS
0489	24725EC	UTILITY RELOCATION - (TIME WARNER CABLE, 5-117.20)	1.00	LS
0490	24725EC	UTILITY RELOCATION - (WINDSTREAM, 5-117.20)	1.00	LS
0491	06406	SBM ALUM SHEET SIGNS .080 IN	353.00	SQFT
0492	06407	SBM ALUM SHEET SIGNS .125 IN	64.00	SQFT
0493	06410	STEEL POST TYPE 1	655.00	LF
0494	06412	STEEL POST MILE MARKERS	2.00	EACH
0495	24631EC	BARCODE SIGN INVENTORY	65.00	EACH
0496	01093	DUCTILE IRON PIPE-6 IN - (150 MM)	240.00	LF
0497	01099	DUCTILE IRON PIPE-12 IN - (300 MM)	4,846.00	LF
0498	01103	DUCTILE IRON PIPE-16 IN - (400 MM)	82.00	LF
0499	03541	BEND 11.25 DEG 12 IN - (300 MM)	9.00	EACH
0500	03548	BEND 22.50 DEG 12 IN - (300 MM)	5.00	EACH
0501	03554	BEND 45 DEG 6 IN - (150 MM)	6.00	EACH
0502	03556	BEND 45 DEG 12 IN - (300 MM)	24.00	EACH
0503	03526	GATE VALVE-6 IN - (150 MM, MJ)	2.00	EACH
0504	03532	GATE VALVE-12 IN - (300 MM, MJ)	4.00	EACH
0505	03536	GATE VALVE-16 IN - (400 MM, MJ)	4.00	EACH
0506	23358EC	TEE-6 IN X 6 IN - (150 MM X 150 MM)	1.00	EACH
0507	20822ED	TEE 12 IN X 6 IN - (300 MM X 150 MM)	1.00	EACH
0508	24065EC	TEE-16X12 IN - (400 MM X 300 MM)	1.00	EACH
0509	23201EC	TEE-16 IN X 16 IN - (400 MM X 400 MM)	1.00	EACH
0510	24486ED	TEE - (24 IN X 12 IN / 600 MM X 300 MM)	1.00	EACH
0511	20056NN	REDUCER - (400 MM X 300 MM)	1.00	EACH
0512	24724EC	PLUG-16 IN - (400 MM)	1.00	EACH
0513	03466	TIE-IN 6 IN - (150 MM)	2.00	EACH
0514	03472	TIE-IN 12 IN - (300 MM)	1.00	EACH

MATERIAL SUMMARY

Project Line No	Bid Code	DESCRIPTION	Quantity	Unit
0515	21113ND	TIE-IN 16 IN - (400 MM)	1.00	EACH
0516	20120EC	SOLID SLEEVE-6 IN - (150 MM)	2.00	EACH
0517	20127EC	SOLID SLEEVE-12 IN - (300 MM)	1.00	EACH
0518	01082	STEEL ENCASEMENT PIPE-BORE&JACK-16 IN - (400 MM, OPEN CUT)	23.00	LF
0519	01080	STEEL ENCASEMENT PIPE-BORE&JACK-20 IN - (500 MM, OPEN CUT)	274.00	LF
0520	02606	FIRE HYDRANT - (TYPE 55, YELLOW, 6 IN / 150 MM)	2.00	EACH
0521	24648EC	FOSTER ADAPTER - (6 INCH / 150 MM)	2.00	EACH
0522	21114ND	CUT AND PLUG 6 IN - (150 MM)	5.00	EACH
0523	20708ND	CUT AND PLUG 12 IN - (300 MM)	2.00	EACH
0524	23192EC	DISCONTINUED WATER METER	1.00	EACH
0525	03433	RELOCATE FIRE HYDRANT - (6 IN / 150 MM)	3.00	EACH
0526	03431	RELOCATE WATER METER	9.00	EACH
0527	21109ND	RELOCATE SERVICE	9.00	EACH
0528	20150EC	TRANSFER SERVICE - (WATER METER)	1.00	EACH
0529	02568	MOBILIZATION	1.00	LS
0530	02569	DEMOBILIZATION	1.00	LS

**SPECIAL NOTE FOR MANDATORY PRE-BID CONFERENCE
KY 61 WIDENING FROM KY 44 TO KY 61 (SECTIONS 1 & 2)
BULLITT COUNTY ~ DISTRICT 5
CID 14-1275**

The Department will conduct a Mandatory Pre-Bid Conference for the subject project on **Thursday, October 2nd, 2014 at 10:00AM Eastern Daylight Time.**

**KYTC Department of Highways
District 5
8310 Westport Road
Louisville, KY 40242
502-210-5400**

Any company that is interested in bidding on the subject project or being part of a joint venture shall 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 shall 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 within the scope of the contract.

Department of Highways officials present at the conference will answer questions concerning the project.

No site visit will be required. However, the Contractor is encouraged to visit each site prior to bidding to become familiar with the requirements of this work. The Cabinet will not consider any claims due to the Contractor having not been familiarized with the requirements of this work.

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
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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:		
	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
	05966	Topdressing Fertilizer	Ton
Subsection:	212.05 PAYMENT.		
Revision:	Add the following pay items:		
	<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 the 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 Sublot(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 Sublots 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:	501.03.19 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.
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:

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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:	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.
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:

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				

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

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

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

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

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

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

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

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: <table><tr><td><u>Code</u></td><td><u>Pay Item</u></td><td><u>Pay Unit</u></td></tr><tr><td>04810</td><td>Electrical Junction Box</td><td>Each</td></tr><tr><td>04811</td><td>Electrical Junction Box Type B</td><td>Each</td></tr><tr><td>20391NS835</td><td>Electrical Junction Box Type A</td><td>Each</td></tr><tr><td>20392NS835</td><td>Electrical Junction Box Type C</td><td>Each</td></tr></table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	04810	Electrical Junction Box	Each	04811	Electrical Junction Box Type B	Each	20391NS835	Electrical Junction Box Type A	Each	20392NS835	Electrical Junction Box Type C	Each
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>														
04810	Electrical Junction Box	Each														
04811	Electrical Junction Box Type B	Each														
20391NS835	Electrical Junction Box Type A	Each														
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:		
	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
	04810	Electrical Junction Box	Each
	04811	Electrical Junction Box Type B	Each
	20391NS835	Electrical Junction Box Type A	Each
	20392NS835	Electrical Junction Box Type C	Each
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-guage stainless steel to provide adjustability to insure weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube of the pole but needs to be at least 15 inches. Provide products that are hot-dip galvanized to the requirements of either ASTM A123 (fabricated products) or ASTM A 153 (hardware items).
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:		
	<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

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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
	Grab Strength (lbs)	700	ASTM D4632
	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.

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- 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.

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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

11G

**SPECIAL NOTE FOR ACCEPTANCE OF DENSITY
OF LONGITUDINAL JOINTS IN ASPHALT SURFACE PAVEMENTS**

This Special Note will apply when indicated on the plans or in the proposal. All applicable portions of the Department's 2012 Standard Specifications for Road and Bridge Construction apply unless specifically modified herein. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

1. DESCRIPTION. This note specifies an increased level of compaction for density acceptance testing required for the longitudinal joint of asphalt surface mixtures compacted under Option A requirements. Due to the inherent difficulty of compacting longitudinal joints, conventional methods of compaction may not be adequate to achieve the desired level of density.

2. MATERIALS AND EQUIPMENT. Reserved.

3. CONSTRUCTION. Reserved.

4. MEASUREMENT. Reserved.

5. PAYMENT.

5.1 Lot Pay Adjustment. Contrary to Subsection 402.05.02, the Department will use the following Lot Pay Adjustment Schedule to assign pay values for Joint Density within each subplot.

JOINT DENSITY	
Pay Value	Test Result (%)
1.05	92.0-96.0
1.00	90.0-91.9 or 96.1-96.5
0.95	89.0-89.9
0.90	88.0-88.9 or 96.6-97.0
0.75	< 88.0 or > 97.0

June 15, 2012

SPECIAL NOTE FOR BARCODE LABEL ON PERMANENT SIGNS

1.0 DESCRIPTION. Install barcode label on sign as specified in the Contract. 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 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:

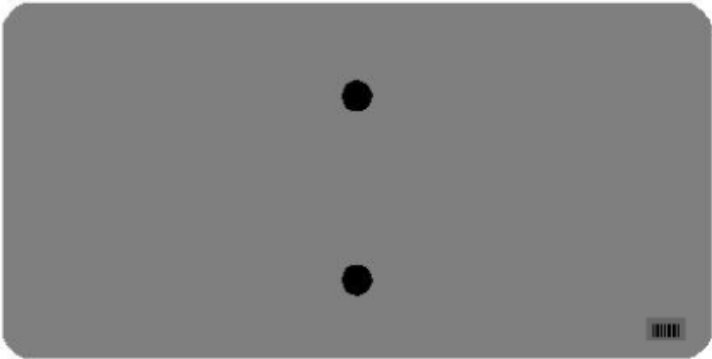
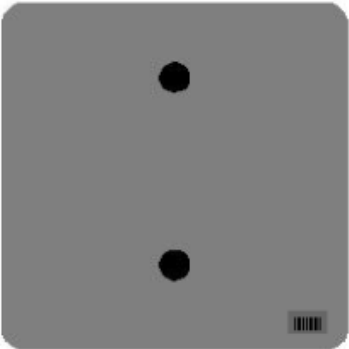
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24631EC	Barcode Sign Inventory	Each

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.

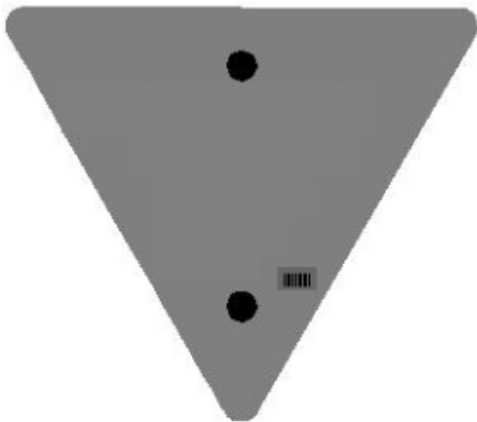
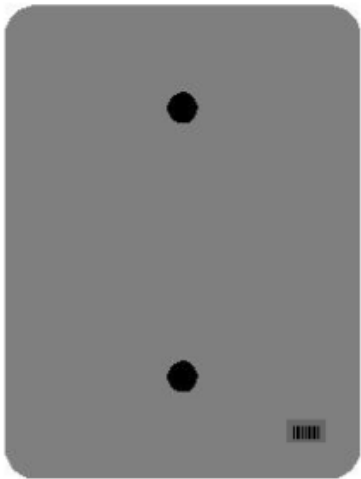
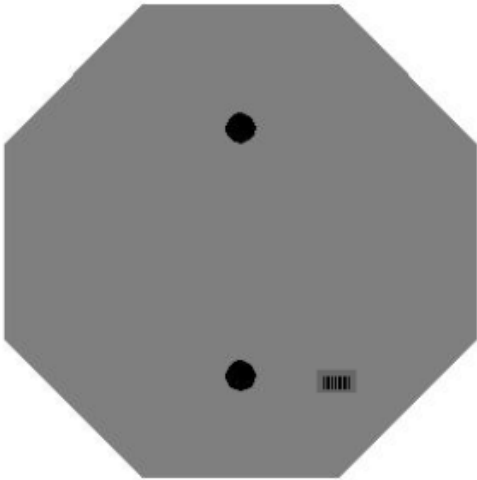
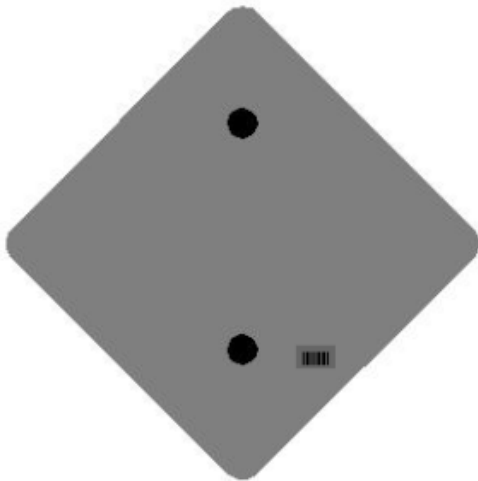
One Sign Post



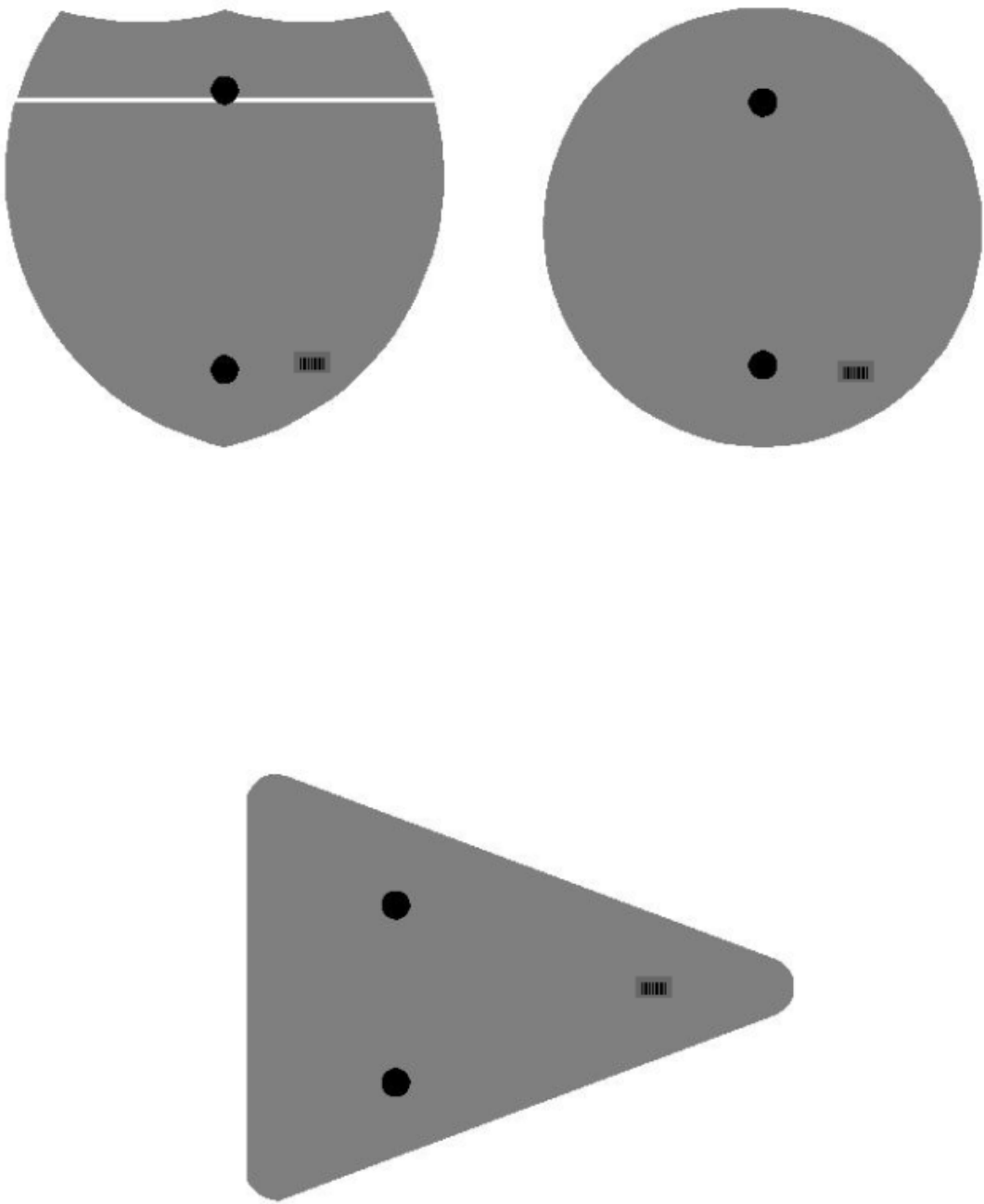
↑
2" Wide Post



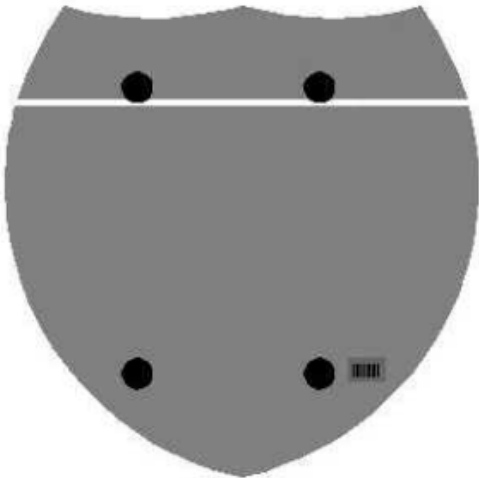
One Sign Post



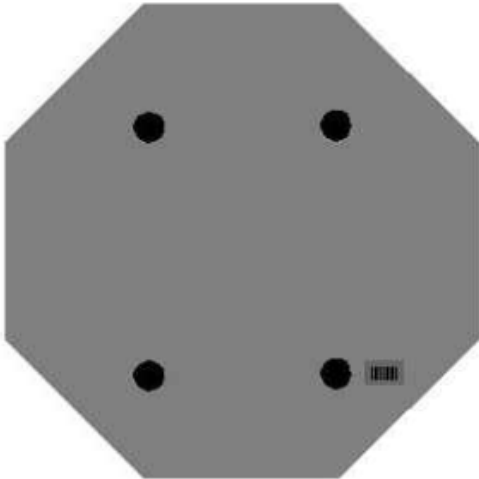
One Sign Post



Double Sign Post

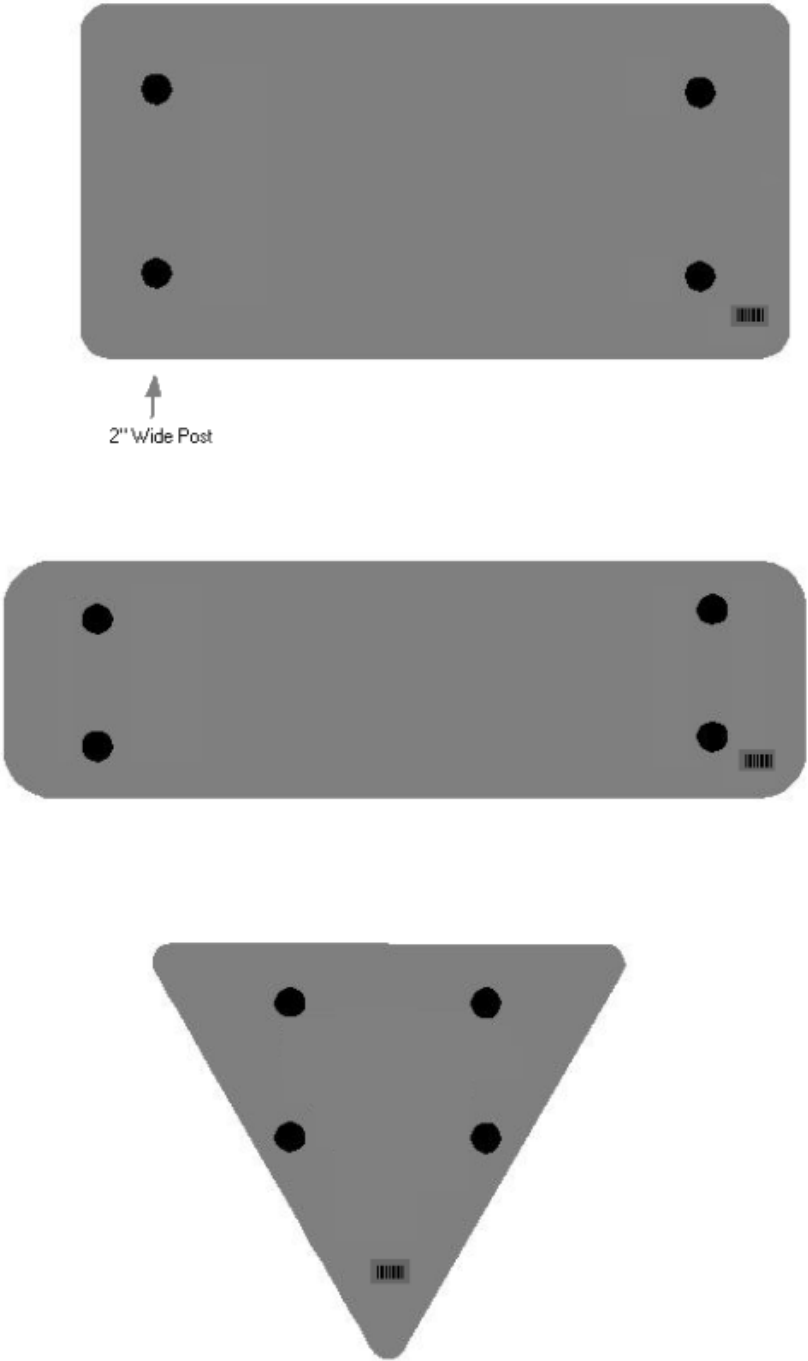


Interstate
Shield



48" Stop

2 Post Signs



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 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: KY140100 08/22/2014 KY100

Superseded General Decision Number: KY20130100

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).

Modification Number	Publication Date
0	01/03/2014
1	02/14/2014
2	04/18/2014
3	05/09/2014
4	05/23/2014
5	06/06/2014
6	06/27/2014
7	07/04/2014
8	07/18/2014
9	07/25/2014
10	08/22/2014

BRIN0004-003 06/01/2011

BRECKENRIDGE COUNTY

	Rates	Fringes
BRICKLAYER.....	\$ 24.11	10.07

BRKY0001-005 06/01/2013		

BULLITT, CARROLL, GRAYSON, HARDIN, HENRY, JEFFERSON, LARUE, MARION, MEADE, NELSON, OLDHAM, SHELBY, SPENCER, & TRIMBLE COUNTIES:

	Rates	Fringes
BRICKLAYER.....	\$ 24.82	10.71

BRKY0002-006 06/01/2011		

BRACKEN, GALLATIN, GRANT, MASON & ROBERTSON COUNTIES:

	Rates	Fringes
BRICKLAYER.....	\$ 26.57	10.26

BRKY0007-004 06/01/2011		

BOYD, CARTER, ELLIOT, FLEMING, GREENUP, LEWIS & ROWAN COUNTIES:

	Rates	Fringes
BRICKLAYER.....	\$ 28.29	16.80

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 04/01/2014		

	Rates	Fringes
CARPENTER.....	\$ 27.50	14.96
Diver.....	\$ 41.63	14.96
PILEDRIVERMAN.....	\$ 27.75	14.96

ELEC0212-008 06/02/2014		

BRACKEN, GALLATIN and GRANT COUNTIES

	Rates	Fringes
ELECTRICIAN.....	\$ 26.74	16.45

ELEC0212-014 07/01/2013		

BRACKEN, GALLATIN & GRANT COUNTIES:

	Rates	Fringes
Sound & Communication Technician.....	\$ 22.50	9.51

* 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 05/29/2013		

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.....	\$ 29.48	14.37

ELEC0575-002 06/02/2014		

FLEMING, GREENUP, LEWIS & MASON COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 31.70	14.21

ENGI0181-018 07/01/2014		

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 28.85	14.15
GROUP 2.....	\$ 26.24	14.15
GROUP 3.....	\$ 26.65	14.15
GROUP 4.....	\$ 25.95	14.15

OPERATING ENGINEER CLASSIFICATIONS

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

GROUP 2 - Air Compressor (Over 900 cu. ft. per min.);
Bituminous Mixer; Boom Type Tamping Machine; Bull Float;
Concrete Mixer (Under 21 cu. ft.); Dredge Engineer;
Electric Vibrator; Compactor/Self-Propelled Compactor;

Elevator (One Drum or Buck Hoist); Elevator (When used to Hoist Building Material); Finish Machine; Firemen & Hoist (One Drum); Flexplane; Forklift (Regardless of Lift Height); Form Grader; Joint Sealing Machine; Outboard Motor Boat; Power Sweeper (Riding Type); Roller (Rock); Ross Carrier; Skid Mounted or Trailer Mounted Concrete Pump; Skid Steer Machine with all Attachments; Switchman or Brakeman; Throttle Valve Person; Tractair & Road Widening Trencher; Tractor (50 H.P. or Over); Truck Crane Oiler; Tugger; Welding Machine; Well Points; & Whirley Oiler

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

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

CRANES - with booms 150 ft. & Over (Including JIB), and where the length of the boom in combination with the length of the piling 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 06/01/2013

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.....	\$ 22.50	18.40
Structural.....	\$ 24.80	18.40

IRON0070-006 06/01/2014

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, Stamplng Ground & Woodlake);

	Rates	Fringes
IRONWORKER.....	\$ 26.97	19.75

IRON0372-006 06/01/2013

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, Pecksrige, Plummers Landing, Plummers Mill, Poplar
Plains,
Ringos Mills, Tilton & Wallingford);
MASON (Western two-thirds, including Townships of Dover,
Lewisburg, Mays Lick, Maysville, Minerva, Moranburg,
Murphysville, Ripley, Sardis, Shannon, South Ripley &
Washington);
NICHOLAS (Townships of Barefoot, Barterville, Carlisle,
Ellisville, Headquarters, Henryville, Morningglory, Myers &
Oakland Mills);
OWEN (Townships of Beechwood, Bromley, Fairbanks, Holbrook,
Jonesville, Long Ridge, Lusby's Mill, New, New Columbus, New
Liberty, Owenton, Poplar Grove, Rockdale, Sanders, Teresita &
Wheatley);
SCOTT (Northern two-thirds, including Townships of Biddle,
Davis, Delaplain, Elmville, Longlick, Muddy Ford, Oxford, Rogers
Gap, Sadieville, Skinnersburg & Stonewall) COUNTIES

	Rates	Fringes
IRONWORKER, REINFORCING.....	\$ 26.47	19.30

IRON0769-007 12/01/2012

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,
Pecksville, 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.....	\$ 32.54	20.18

LAB00189-003 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

LAB00189-008 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

LAB00189-009 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 05/01/2014

BRACKEN, GALLATIN, GRANT, MASON & OWEN COUNTIES:

	Rates	Fringes
PAINTER (Heavy & Highway Bridges - Guardrails - Lightpoles - Striping)		
Bridge Equipment Tender and Containment Builder.....\$ 20.73		8.71
Brush & Roller.....\$ 23.39		8.71
Elevated Tanks; Steeplejack Work; Bridge & Lead Abatement.....\$ 24.39		8.71
Sandblasting & Water Blasting.....\$ 24.14		8.71
Spray.....\$ 23.89		8.71

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		12.02
Spray, Sandblast, Power Tools, Waterblast & Steam Cleaning.....\$ 19.00		12.02

PAIN1072-003 12/01/2013

BOYD, CARTER, ELLIOTT, GREENUP, LEWIS and ROWAN COUNTIES

	Rates	Fringes
Painters:		
Bridges; Locks; Dams;		
Tension Towers & Energized		
Substations.....	\$ 31.03	15.10
Power Generating Facilities.	\$ 27.79	15.10

PLUM0248-003 06/01/2014

BOYD, CARTER, ELLIOTT, GREENUP, LEWIS & ROWAN COUNTIES:

	Rates	Fringes
Plumber and Steamfitter.....	\$ 33.00	18.95

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.

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Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification
and wage rates that have been found to be prevailing for the
cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical
order of "identifiers" that indicate whether the particular
rate is union or non-union.

Union Identifiers

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

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

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

Non-Union Identifiers

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

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

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION

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

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

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

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

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

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

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

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

OVERTIME:

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

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

PART IV

INSURANCE

INSURANCE

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

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

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

PART V

BID ITEMS

Section: 0001 - PAVING - ALTERNATE 1 - ASPHALT

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0010	00003		CRUSHED STONE	93,428.00	TON		\$	
0020	00013		LIME STABILIZED	102,918.00	SQYD		\$	
0030	00014		LIME	1,947.00	TON		\$	
0040	00018		DRAINAGE BLANKET-TYPE II-	18,204.00	TON		\$	
0050	00100		ASPHALT SEAL	328.00	TON		\$	
0060	00103		ASPHALT SEAL	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-	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	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 PRICE	FP	AMOUNT
1270	00003		CRUSHED STONE	79,386.00	TON		\$	
1280	00013		LIME STABILIZED	102,918.00	SQYD		\$	
1290	00014		LIME	1,947.00	TON		\$	
1300	00018		DRAINAGE BLANKET-TYPE II-	16,542.00	TON		\$	
1310	00100		ASPHALT SEAL	328.00	TON		\$	
1320	00103		ASPHALT SEAL	40.00	TON		\$	
1330	00212		CL2 ASPH BASE 1.00D PG64-22	13,150.00	TON		\$	
1340	00214		CL3 ASPH BASE 1.00D PG64-22	1,500.00	TON		\$	
1350	00301		CL2 ASPH SURF 0.38D PG64-22	4,506.00	TON		\$	
1360	00336		CL3 ASPH SURF 0.38A PG76-	650.00	TON		\$	
1370	00358		ASPHALT CURING SEAL	104.00	TON		\$	
1380	02073		JPC PAVEMENT-9 IN	113,177.00	SQYD		\$	
1390	02075		JPC PAVEMENT-6 IN	29,801.00	SQYD		\$	
1400	02702		SAND FOR	257.00	TON		\$	
1410	10203ND		PAVEMENT ADJUSTMENT (CONCRETE, 5-117.10)	1.00	LS	\$287,165.00	\$	\$287,165.00
1420	10203ND		PAVEMENT ADJUSTMENT (CONCRETE, 5-117.20)	1.00	LS	\$196,277.00	\$	\$196,277.00

Section: 0003 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1430	00078		CRUSHED AGGREGATE SIZE NO 2	28.60	TON		\$	
1440	01000		PERFORATED PIPE-4	26,326.50	LF		\$	
1450	01010		NON-PERFORATED PIPE-4 IN	425.50	LF		\$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1460	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM (5-117.10)	1.00	LS		\$	
1470	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM (5-117.20)	1.00	LS		\$	
1480	01020		PERF PIPE HEADWALL TY 1-4 IN	5.00	EACH		\$	
1490	01024		PERF PIPE HEADWALL TY 2-4 IN	1.00	EACH		\$	
1500	01028		PERF PIPE HEADWALL TY 3-4 IN	1.00	EACH		\$	
1510	01032		PERF PIPE HEADWALL TY 4-4 IN	13.00	EACH		\$	
1520	01310		REMOVE PIPE	2,664.00	LF		\$	
1530	01584		CAP DROP BOX	1.00	EACH		\$	
1540	01706		REMOVE CATCH	27.00	EACH		\$	
1550	01740		CORED HOLE DRAINAGE BOX CON-4 IN	148.00	EACH		\$	
1560	01786		FILL AND CAP	6.00	EACH		\$	
1570	01787		REMOVE MANHOLE	5.00	EACH		\$	
1580	01792		ADJUST	13.00	EACH		\$	
1590	01810		STANDARD CURB AND	7,871.00	LF		\$	
1600	01811		STANDARD CURB AND GUTTER MOD	5,395.00	LF		\$	
1610	01845		ISLAND INTEGRAL CURB	270.50	LF		\$	
1620	01875		STANDARD HEADER	1,105.00	LF		\$	
1630	01897		ASPHALT WEDGE CURB	55.00	LF		\$	
1640	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	139.00	EACH		\$	
1650	01983		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL YELLOW	36.00	EACH		\$	
1660	01984		DELINEATOR FOR BARRIER - WHITE	48.00	EACH		\$	
1670	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	26.00	EACH		\$	
1680	01990		DELINEATOR FOR BARRIER WALL-	5.00	EACH		\$	
1690	02003		RELOCATE TEMP CONC BARRIER	11,985.00	LF		\$	
1700	02014		BARRICADE-TYPE III	48.00	EACH		\$	
1710	02091		REMOVE PAVEMENT	1,715.10	SQYD		\$	
1720	02101		CEM CONC ENT PAVEMENT-8	2,270.00	SQYD		\$	
1730	02159		TEMP	23,672.00	LF		\$	
1740	02200		ROADWAY	350,939.00	CUYD		\$	
1750	02223		GRANULAR EMBANKMENT	12,130.00	CUYD		\$	
1760	02242		WATER (FOR DUST CONTROL)	6.00	MGAL		\$	
1770	02242		WATER	4.40	MGAL		\$	
1780	02262		FENCE-WOVEN WIRE TYPE 1	15,470.00	LF		\$	
1790	02351		GUARDRAIL-STEEL W BEAM-S FACE	10,156.50	LF		\$	
1800	02352		GUARDRAIL-STEEL W BEAM-D FACE	825.00	LF		\$	
1810	02360		GUARDRAIL TERMINAL SECTION NO	11.00	EACH		\$	
1820	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A	12.00	EACH		\$	
1830	02365		CRASH CUSHION TYPE IX-A	6.00	EACH		\$	
1840	02367		GUARDRAIL END TREATMENT TYPE 1	12.00	EACH		\$	
1850	02369		GUARDRAIL END TREATMENT TYPE 2A	22.00	EACH		\$	
1860	02381		REMOVE GUARDRAIL	3,735.40	LF		\$	
1870	02383		REMOVE & RESET GUARDRAIL	523.00	LF		\$	
1880	02387		GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	11.00	EACH		\$	
1890	02391		GUARDRAIL END TREATMENT TYPE 4A	1.00	EACH		\$	
1900	02397		TEMP GUARDRAIL	226.50	LF		\$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1910	02429		RIGHT-OF-WAY MONUMENT TYPE 1	119.00	EACH		\$	
1920	02430		RIGHT-OF-WAY MONUMENT TYPE 1A	11.00	EACH		\$	
1930	02432		WITNESS POST	33.00	EACH		\$	
1940	02483		CHANNEL LINING CLASS	5,411.00	TON		\$	
1950	02484		CHANNEL LINING CLASS	5,380.00	TON		\$	
1960	02545		CLEARING AND GRUBBING (APPROXIMATELY 41.521 ACRES)	1.00	LS		\$	
1970	02545		CLEARING AND GRUBBING (APPROXIMATELY 56.745 ACRES)	1.00	LS		\$	
1980	02555		CONCRETE-CLASS B	327.00	CUYD		\$	
1990	02562		TEMPORARY	2,691.00	SQFT		\$	
2000	02585		EDGE	264.20	LF		\$	
2010	02596		FABRIC-GEOTEXTILE TYPE I	13,854.00	SQYD		\$	
2020	02599		FABRIC-GEOTEXTILE TYPE IV	270,907.00	SQYD		\$	
2030	02625		REMOVE HEADWALL	17.00	EACH		\$	
2040	02650		MAINTAIN & CONTROL TRAFFIC (5-117.10)	1.00	LS		\$	
2050	02650		MAINTAIN & CONTROL TRAFFIC (5-117.20)	1.00	LS		\$	
2060	02651		DIVERSIONS (BY-PASS DETOURS) (A: STA. 3+305.000, MAINLINE KY 61)	1.00	LS		\$	
2070	02651		DIVERSIONS (BY-PASS DETOURS) (B: STA. 0+000.000, MAINLINE KY 61)	1.00	LS		\$	
2080	02651		DIVERSIONS (BY-PASS DETOURS) (CRR DIVERSION, STA. 4+947.527, CORAL RIDGE ROAD)	1.00	LS		\$	
2090	02651		DIVERSIONS (BY-PASS DETOURS) (NS DIVERSION STA. 0+000.000, NORTH SIDE AVENUE)	1.00	LS		\$	
2100	02651		DIVERSIONS (BY-PASS DETOURS) (POINTE DIVERSION STA. 0+000.000, POINTE BOULEVARD)	1.00	LS		\$	
2110	02651		DIVERSIONS (BY-PASS DETOURS) (KY 61 CONNECTOR)	1.00	LS		\$	
2120	02651		DIVERSIONS (BY-PASS DETOURS) (BECNEL LANE, STA. 0+152.999 @ MAINLINE 5+834.523)	1.00	LS		\$	
2130	02651		DIVERSIONS (BY-PASS DETOURS) (HILLBROOK DRIVE, STA. 5+000.000 @ MAINLINE 6+170.000)	1.00	LS		\$	
2140	02671		PORTABLE CHANGEABLE MESSAGE SIGN	6.00	EACH		\$	
2150	02676		MOBILIZATION FOR MILL & TEXT (5-117.10)	1.00	LS		\$	
2160	02677		ASPHALT PAVE MILLING &	442.00	TON		\$	
2170	02690		SAFELOADING	227.00	CUYD		\$	
2180	02696		SHOULDER RUMBLE STRIPS-	34,933.00	LF		\$	
2190	02701		TEMP SILT FENCE	23,672.00	LF		\$	
2200	02703		SILT TRAP TYPE	81.00	EACH		\$	
2210	02704		SILT TRAP TYPE	81.00	EACH		\$	
2220	02705		SILT TRAP TYPE	81.00	EACH		\$	
2230	02706		CLEAN SILT TRAP TYPE	162.00	EACH		\$	
2240	02707		CLEAN SILT TRAP TYPE B	162.00	EACH		\$	
2250	02708		CLEAN SILT TRAP TYPE C	162.00	EACH		\$	
2260	02709		CLEAN TEMP SILT	47,342.00	LF		\$	
2270	02720		SIDEWALK-4 IN	6,775.00	SQYD		\$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
2280	02726		STAKING (5-117.10)	1.00	LS		\$	
2290	02726		STAKING (5-117.20)	1.00	LS		\$	
2300	02731		REMOVE STRUCTURE (CSX BRIDGE)	1.00	LS		\$	
2310	02731		REMOVE STRUCTURE (CULVERT)	1.00	LS		\$	
2320	02775		ARROW	4.00	EACH		\$	
2330	02898		RELOCATE CRASH CUSHION	58.00	EACH		\$	
2340	03171		CONCRETE BARRIER WALL TYPE 9T	2,897.00	LF		\$	
2350	03225		TUBULAR	198.00	EACH		\$	
2360	05950		EROSION CONTROL	4,298.00	SQYD		\$	
2370	05952		TEMP	482,810.00	SQYD		\$	
2380	05953		TEMP SEEDING AND PROTECTION	482,810.00	SQYD		\$	
2390	05963		INITIAL FERTILIZER	92.00	TON		\$	
2400	05964		20-10-10 FERTILIZER	24.00	TON		\$	
2410	05985		SEEDING AND	413,597.00	SQYD		\$	
2420	05989		SPECIAL SEEDING CROWN	27,622.00	SQYD		\$	
2430	05992		AGRICULTURAL	280.00	TON		\$	
2440	06510		PAVE STRIPING-TEMP PAINT-4 IN	127,152.00	LF		\$	
2450	06514		PAVE STRIPING-PERM PAINT-4	156,942.00	LF		\$	
2460	06550		PAVE STRIPING-TEMP REM TAPE-	32,457.00	LF		\$	
2470	06551		PAVE STRIPING-TEMP REM TAPE-Y	32,457.00	LF		\$	
2480	06565		PAVE MARKING-THERMO X-WALK-6 IN	843.00	LF		\$	
2490	06568		PAVE MARKING-THERMO STOP BAR-24IN	223.00	LF		\$	
2500	06569		PAVE MARKING-THERMO CROSS-	5,371.00	SQFT		\$	
2510	06574		PAVE MARKING-THERMO CURV ARROW	44.00	EACH		\$	
2520	06576		PAVE MARKING-THERMO	1.00	EACH		\$	
2530	06578		PAVE MARKING-THERMO MERGE ARROW	4.00	EACH		\$	
2540	06588		PAVEMENT MARKER TY IVA-BY	1,093.00	EACH		\$	
2550	08001		STRUCTURE EXCAVATION-	588.00	CUYD		\$	
2560	08002		STRUCTURE EXCAV-SOLID ROCK	53.00	CUYD		\$	
2570	08100		CONCRETE-CLASS	8.30	CUYD		\$	
2580	08903		CRASH CUSHION TY VI CLASS BT	11.00	EACH		\$	
2590	20000ES724		TRE	28.00	EACH		\$	
2600	20259ED		TEMPORARY MEDIAN CROSSOVER	4.00	EACH		\$	
2610	20424EC		CONNECT TO EXIST	1.00	EACH		\$	
2620	20914ED		ROLLED CURB AND GUTTER	146.00	LF		\$	
2630	21342ED		FORM LINER (COBBLESTONE)	2,671.00	SQFT		\$	
2640	23131ER701		PIPELINE VIDEO	11,762.00	LF		\$	
2650	23139EN		STRIPING REMOVAL	55,072.00	LF		\$	
2660	23158ES505		DETECTABLE	1,299.00	SQFT		\$	
2670	23274EN11F		TURF REINFORCEMENT MAT	28,797.00	SQYD		\$	
2680	24096EC		REMOVE AND RESET END TREATMENT	2.00	EACH		\$	
2690	24721EC		CHEMICAL TESTING EQUIPMENT (X-RAY)	1.00	LS	\$460,000.00	\$	\$460,000.00

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
2700	00440		ENTRANCE PIPE-15 IN	431.00	LF		\$	
2710	00441		ENTRANCE PIPE-18 IN	136.00	LF		\$	
2720	00443		ENTRANCE PIPE-24 IN	118.00	LF		\$	
2730	00461		CULVERT PIPE-15 IN	52.00	LF		\$	
2740	00462		CULVERT PIPE-18 IN	976.00	LF		\$	
2750	00464		CULVERT PIPE-24 IN	171.00	LF		\$	
2760	00466		CULVERT PIPE-30 IN	404.00	LF		\$	
2770	00468		CULVERT PIPE-36 IN	133.00	LF		\$	
2780	00469		CULVERT PIPE-42 IN	230.00	LF		\$	
2790	00470		CULVERT PIPE-48 IN	149.00	LF		\$	
2800	00498		CULVERT PIPE-42 IN EQUIV	41.00	LF		\$	
2810	00500		CULVERT PIPE-54 IN EQUIV	46.00	LF		\$	
2820	00521		STORM SEWER PIPE-15	6,440.00	LF		\$	
2830	00522		STORM SEWER PIPE-18	2,768.00	LF		\$	
2840	00524		STORM SEWER PIPE-24	3,537.00	LF		\$	
2850	00525		STORM SEWER PIPE-27	115.00	LF		\$	
2860	00526		STORM SEWER PIPE-30	1,064.00	LF		\$	
2870	00528		STORM SEWER PIPE-36	265.00	LF		\$	
2880	00530		STORM SEWER PIPE-48	128.00	LF		\$	
2890	00556		STORM SEWER PIPE-30 IN EQUIV	3,644.00	LF		\$	
2900	00560		STORM SEWER PIPE-48 IN EQUIV	118.00	LF		\$	
2910	01204		PIPE CULVERT HEADWALL-18 IN	3.00	EACH		\$	
2920	01204		PIPE CULVERT HEADWALL-18 IN	6.00	EACH		\$	
2930	01210		PIPE CULVERT HEADWALL-30 IN	1.00	EACH		\$	
2940	01210		PIPE CULVERT HEADWALL-30 IN	1.00	EACH		\$	
2950	01212		PIPE CULVERT HEADWALL-36 IN	1.00	EACH		\$	
2960	01214		PIPE CULVERT HEADWALL-42 IN	3.00	EACH		\$	
2970	01215		PIPE CULVERT HEADWALL-42 IN	1.00	EACH		\$	
2980	01216		PIPE CULVERT HEADWALL-48 IN	4.00	EACH		\$	
2990	01374		METAL END SECTION TY 1-30 IN	1.00	EACH		\$	
3000	01390		METAL END SECTION TY 3-15 IN	28.00	EACH		\$	
3010	01391		METAL END SECTION TY 3-18 IN	22.00	EACH		\$	
3020	01393		METAL END SECTION TY 3-24 IN	9.00	EACH		\$	
3030	01394		METAL END SECTION TY 3-30 IN	6.00	EACH		\$	
3040	01395		METAL END SECTION TY 3-36 IN	5.00	EACH		\$	
3050	01396		METAL END SECTION TY 3-42 IN	1.00	EACH		\$	
3060	01397		METAL END SECTION TY 3-48 IN	1.00	EACH		\$	
3070	01456		CURB BOX INLET TYPE	127.00	EACH		\$	
3080	01480		CURB BOX INLET TYPE B	13.00	EACH		\$	
3090	01487		CURB BOX INLET TYPE	3.00	EACH		\$	
3100	01490		DROP BOX INLET TYPE 1	7.00	EACH		\$	
3110	01496		DROP BOX INLET TYPE 3	10.00	EACH		\$	
3120	01499		DROP BOX INLET TYPE 4	3.00	EACH		\$	
3130	01514		DROP BOX INLET TYPE 5E	1.00	EACH		\$	
3140	01517		DROP BOX INLET TYPE	13.00	EACH		\$	
3150	01538		DROP BOX INLET TYPE 7	3.00	EACH		\$	
3160	01544		DROP BOX INLET TYPE	1.00	EACH		\$	
3170	01559		DROP BOX INLET TYPE 13G	11.00	EACH		\$	
3180	01568		DROP BOX INLET TYPE	2.00	EACH		\$	
3190	01577		DROP BOX INLET TYPE	2.00	EACH		\$	
3200	01585		REMOVE DROP BOX	1.00	EACH		\$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
3210	01641		JUNCTION BOX-15	1.00	EACH		\$	
3220	01642		JUNCTION BOX-18	1.00	EACH		\$	
3230	01643		JUNCTION BOX-24	2.00	EACH		\$	
3240	01645		JUNCTION BOX-36	2.00	EACH		\$	
3250	01767		MANHOLE TYPE	3.00	EACH		\$	
3260	01789		RECONSTRUCT MANHOLE	1.00	EACH		\$	
3270	02600		FABRIC GEOTEXTILE TY IV FOR	33,460.00	SQYD	\$2.00	\$	\$66,920.00
3280	21880NN		METAL END SECTION TY 3-42 IN	1.00	EACH		\$	
3290	23048NN		METAL END SECTION TY 3-54 IN	2.00	EACH		\$	

Section: 0005 - BRIDGE - CSX RR, DWG. 24693

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
3300	02231		STRUCTURE GRANULAR	944.00	CUYD		\$	
3310	02998		MASONRY	4,613.00	SQYD		\$	
3320	03299		ARMORED EDGE FOR	453.00	LF		\$	
3330	08002		STRUCTURE EXCAV-SOLID ROCK	3,083.00	CUYD		\$	
3340	08003		FOUNDATION PREPARATION (CSX BRIDGE)	1.00	LS		\$	
3350	08033		TEST PILES	43.00	LF		\$	
3360	08039		PRE-DRILLING FOR	164.00	LF		\$	
3370	08046		PILES-STEEL	1,040.00	LF		\$	
3380	08094		PILE POINTS-12	67.00	EACH		\$	
3390	08100		CONCRETE-CLASS	1,696.00	CUYD		\$	
3400	08104		CONCRETE-CLASS AA	1,297.70	CUYD		\$	
3410	08150		STEEL REINFORCEMENT	280,575.00	LB		\$	
3420	08151		STEEL REINFORCEMENT-EPOXY COATED	344,535.00	LB		\$	
3430	08635		PRECAST PC I BEAM TYPE 6	4,282.10	LF		\$	
3440	21532ED		RAIL SYSTEM TYPE III	1,472.00	LF		\$	
3450	23964EC		PROTECTIVE FENCE	1,472.00	LF		\$	

Section: 0006 - BRIDGE - I-65 - DWG. 24691

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
3460	02231		STRUCTURE GRANULAR	914.00	CUYD		\$	
3470	02731		REMOVE STRUCTURE (REMOVE EXISTING RETAINING WALL)	1.00	LS		\$	
3480	02998		MASONRY	1,243.00	SQYD		\$	
3490	03299		ARMORED EDGE FOR	102.70	LF		\$	
3500	08002		STRUCTURE EXCAV-SOLID ROCK	75.00	CUYD		\$	
3510	08003		FOUNDATION PREPARATION (I-65 BRIDGE)	1.00	LS		\$	
3520	08018		RETAINING WALL	4,112.00	SQFT		\$	
3530	08033		TEST PILES	59.00	LF		\$	
3540	08046		PILES-STEEL	679.10	LF		\$	
3550	08094		PILE POINTS-12	30.00	EACH		\$	
3560	08100		CONCRETE-CLASS	132.70	CUYD		\$	
3570	08104		CONCRETE-CLASS AA	441.20	CUYD		\$	
3580	08150		STEEL REINFORCEMENT	25,686.00	LB		\$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
3590	08151		STEEL REINFORCEMENT-EPOXY COATED	100,257.00	LB		\$	
3600	08269		ELECTRICAL CONDUIT (APPROXIMATE LENGTH OF 512 FEET)	1.00	LS		\$	
3610	08635		PRECAST PC I BEAM TYPE 6	1,262.50	LF		\$	
3620	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 PRICE	FP	AMOUNT
3630	08003		FOUNDATION PREPARATION (CULVERT, 24614)	1.00	LS		\$	
3640	08100		CONCRETE-CLASS	83.80	CUYD		\$	
3650	08150		STEEL REINFORCEMENT	12,082.00	LB		\$	

Section: 0008 - BRIDGE - BLUE LICK CREEK - DWG. 24695

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
3660	02231		STRUCTURE GRANULAR	156.00	CUYD		\$	
3670	02596		FABRIC-GEOTEXTILE TYPE I	2,846.00	SQYD		\$	
3680	02998		MASONRY	5,555.00	SQYD		\$	
3690	03299		ARMORED EDGE FOR	170.00	LF		\$	
3700	08002		STRUCTURE EXCAV-SOLID ROCK	128.00	CUYD		\$	
3710	08003		FOUNDATION PREPARATION (BLUE LICK CREEK)	1.00	LS		\$	
3720	08019		CYCLOPEAN STONE RIP	2,816.00	TON		\$	
3730	08033		TEST PILES	207.00	LF		\$	
3740	08046		PILES-STEEL	2,965.00	LF		\$	
3750	08094		PILE POINTS-12	114.00	EACH		\$	
3760	08100		CONCRETE-CLASS	476.90	CUYD		\$	
3770	08104		CONCRETE-CLASS AA	589.90	CUYD		\$	
3780	08150		STEEL REINFORCEMENT	76,519.00	LB		\$	
3790	08151		STEEL REINFORCEMENT-EPOXY COATED	131,960.00	LB		\$	
3800	08633		PRECAST PC I BEAM TYPE 3	1,697.50	LF		\$	
3810	21532ED		RAIL SYSTEM TYPE III	691.30	LF		\$	

Section: 0009 - BRIDGE - CULVERT - DWG. 24615

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
3820	08002		STRUCTURE EXCAV-SOLID ROCK	233.10	CUYD		\$	
3830	08003		FOUNDATION PREPARATION (CULVERT 24615)	1.00	LS		\$	
3840	08100		CONCRETE-CLASS	218.60	CUYD		\$	
3850	08150		STEEL REINFORCEMENT	19,809.00	LB		\$	

Section: 0010 - UTILITY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0160	01069		STEEL ENCASEMENT PIPE-12 IN (OPEN CUT-WINDSTREAM: BLUE LICK ROAD)	70.00	LF		\$	
0170	24725EC		UTILITY RELOCATION (LG&E-ELECTRIC, 5-117.10)	1.00	LS		\$	
0180	24725EC		UTILITY RELOCATION (LG&E-GAS, 5-117.10)	1.00	LS		\$	
0190	24725EC		UTILITY RELOCATION (WINDSTREAM, 5-117.10)	1.00	LS		\$	
0200	24725EC		UTILITY RELOCATION (TIME WARNER CABLE, 5-117.10)	1.00	LS		\$	
0210	24725EC		UTILITY RELOCATION (BULLITT CO. SCHOOLS)	1.00	LS		\$	
0220	24725EC		UTILITY RELOCATION (LG&E-ELECTRIC, 5-117.20)	1.00	LS		\$	
0230	24725EC		UTILITY RELOCATION (LG&E-GAS, 5-117.20)	1.00	LS		\$	
0240	24725EC		UTILITY RELOCATION (TIME WARNER CABLE, 5-117.20)	1.00	LS		\$	
0250	24725EC		UTILITY RELOCATION (WINDSTREAM, 5-117.20)	1.00	LS		\$	

Section: 0011 - SEWER

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0260	01055		SEWER PIPE-15 IN (PVC, GRAVITY, OPEN CUT)	334.00	LF		\$	
0270	21382ND		CUT AND PLUG-8 IN (PVC)	2.00	EACH		\$	
0280	22986NN		TIE NEW 15 IN PVC SEWER TO EXIST MANHOLE	2.00	EACH		\$	

Section: 0012 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0290	06406		SBM ALUM SHEET SIGNS .080	790.00	SQFT		\$	
0300	06407		SBM ALUM SHEET SIGNS .125	120.00	SQFT		\$	
0310	06410		STEEL POST TYPE 1	1,624.00	LF		\$	
0320	06412		STEEL POST MILE	8.00	EACH		\$	
0330	20418ED		REMOVE & RELOCATE SIGNS	1.00	EACH		\$	
0340	24631EC		BARCODE SIGN	165.00	EACH		\$	

Section: 0013 - SIGNALIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0350	04792		CONDUIT-1 IN	70.00	LF		\$	
0360	04793		CONDUIT-1 1/4 IN	230.00	LF		\$	
0370	04795		CONDUIT-2 IN	160.00	LF		\$	
0380	04811		ELECTRICAL JUNCTION BOX TYPE	5.00	EACH		\$	
0390	04820		TRENCHING AND BACKFILLING	460.00	LF		\$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0400	04830		LOOP WIRE	3,743.00	LF		\$	
0410	04844		CABLE-NO. 14/5C	3,466.00	LF		\$	
0420	04850		CABLE-NO. 14/1 PAIR	2,288.00	LF		\$	
0430	04885		MESSENGER-10800	900.00	LF		\$	
0440	04895		LOOP SAW SLOT AND	1,436.00	LF		\$	
0450	04931		INSTALL CONTROLLER TYPE	2.00	EACH		\$	
0460	04932		INSTALL STEEL STRAIN	8.00	EACH		\$	
0470	04950		REMOVE SIGNAL	1.00	EACH		\$	
0480	20093NS835		INSTALL PEDESTRIAN HEAD-LED	12.00	EACH		\$	
0490	20094ES835		TEMP RELOCATION OF SIGNAL	38.00	EACH		\$	
0500	20188NS835		INSTALL LED SIGNAL-3 SECTION	19.00	EACH		\$	
0510	21743NN		INSTALL PEDESTRIAN	12.00	EACH		\$	
0520	23157EN		TRAFFIC SIGNAL POLE BASE	35.00	CUYD		\$	
0530	23222EC		INSTALL SIGNAL PEDESTAL	4.00	EACH		\$	
0540	23982EC		INSTALL ANTENNA	2.00	EACH		\$	

Section: 0014 - WATERLINE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0550	01080		STEEL ENCASEMENT PIPE-BORE&JACK-20 IN (500 MM, OPEN CUT)	274.00	LF		\$	
0560	01082		STEEL ENCASEMENT PIPE-BORE&JACK-16 IN (400 MM, OPEN CUT)	23.00	LF		\$	
0570	01093		DUCTILE IRON PIPE-6 IN (150 MM)	296.00	LF		\$	
0580	01095		DUCTILE IRON PIPE-8 IN (200 MM)	125.00	LF		\$	
0590	01099		DUCTILE IRON PIPE-12 IN (300 MM)	8,583.00	LF		\$	
0600	01103		DUCTILE IRON PIPE-16 IN (400 MM)	2,398.00	LF		\$	
0610	01111		DUCTILE IRON PIPE-24 IN (600 MM WITH NITRILE GASKETS)	394.00	LF		\$	
0620	01111		DUCTILE IRON PIPE-24 IN (600 MM)	9,403.00	LF		\$	
0630	01315		BLOW-OFF ASSEMBLY (2 IN / 50 MM)	1.00	EACH		\$	
0640	02606		FIRE HYDRANT (TYPE 55, YELLOW, 6 IN / 150 MM)	2.00	EACH		\$	
0650	03431		RELOCATE WATER	54.00	EACH		\$	
0660	03433		RELOCATE FIRE HYDRANT (6 IN / 150 MM)	14.00	EACH		\$	
0670	03466		TIE-IN 6 IN (150 MM)	4.00	EACH		\$	
0680	03468		TIE-IN 8 IN (200 MM)	3.00	EACH		\$	
0690	03472		TIE-IN 12 IN (300 MM)	9.00	EACH		\$	
0700	03474		TIE-IN 24 IN (600 MM)	1.00	EACH		\$	
0710	03526		GATE VALVE-6 IN (150 MM, MJ)	6.00	EACH		\$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
0720	03528		GATE VALVE-8 IN (200 MM, MJ)	3.00	EACH		\$	
0730	03532		GATE VALVE-12 IN (300 MM, MJ)	22.00	EACH		\$	
0740	03536		GATE VALVE-16 IN (400 MM, MJ)	6.00	EACH		\$	
0750	03539		BEND 11.25 DEG 8 IN (200 MM)	1.00	EACH		\$	
0760	03541		BEND 11.25 DEG 12 IN (300 MM)	9.00	EACH		\$	
0770	03543		BEND 11.25 DEG 16 IN (400 MM)	3.00	EACH		\$	
0780	03546		BEND 22.50 DEG 8 IN (200 MM)	1.00	EACH		\$	
0790	03548		BEND 22.50 DEG 12 IN (300 MM)	8.00	EACH		\$	
0800	03552		BEND 22.50 DEG 16 IN (400 MM)	5.00	EACH		\$	
0810	03554		BEND 45 DEG 6 IN (150 MM)	10.00	EACH		\$	
0820	03556		BEND 45 DEG 12 IN (300 MM)	33.00	EACH		\$	
0830	03558		BEND 45 DEG 16 IN (400 MM)	8.00	EACH		\$	
0840	03563		BEND 45 DEG 8 IN (200 MM)	3.00	EACH		\$	
0850	20056NN		REDUCER (24 IN X 12 IN / 600 MM X 300 MM)	1.00	EACH		\$	
0860	20056NN		REDUCER (400 MM X 300 MM)	1.00	EACH		\$	
0870	20120EC		SOLID SLEEVE-6 IN (150 MM)	2.00	EACH		\$	
0880	20127EC		SOLID SLEEVE-12 IN (300 MM)	1.00	EACH		\$	
0890	20150EC		TRANSFER SERVICE (WATER METER)	1.00	EACH		\$	
0900	20154ND		DRAIN ASSEMBLY (8 IN / 200 MM)	4.00	EACH		\$	
0910	20349NC		RELOCATE FIRE SERVICE	1.00	EACH		\$	
0920	20707ND		CUT AND PLUG 16 IN (400 MM)	9.00	EACH		\$	
0930	20708ND		CUT AND PLUG 12 IN (300 MM)	10.00	EACH		\$	
0940	20821ND		TEE 12 IN X 12 IN (300 MM X 300 MM)	6.00	EACH		\$	
0950	20822ED		TEE 12 IN X 6 IN (300 MM X 150 MM)	3.00	EACH		\$	
0960	21094ND		TEE 12 IN X 8 IN (300 MM X 200 MM)	2.00	EACH		\$	
0970	21109ND		RELOCATE SERVICE	54.00	EACH		\$	
0980	21113ND		TIE-IN 16 IN (400 MM)	10.00	EACH		\$	
0990	21114ND		CUT AND PLUG 6 IN (150 MM)	7.00	EACH		\$	
1000	21382ND		CUT AND PLUG-8 IN (200 MM)	3.00	EACH		\$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1010	22191NN		BEND 45 DEG-24 IN (600 MM)	6.00	EACH		\$	
1020	23192EC		DISCONTINUED WATER METER	1.00	EACH		\$	
1030	23194EC		GATE VALVE-24 IN (600 MJ)	5.00	EACH		\$	
1040	23197EC		PLUG-24 IN (600 MM)	3.00	EACH		\$	
1050	23200EC		TEE-16 IN X 8 IN (400 MM X 200 MM)	1.00	EACH		\$	
1060	23201EC		TEE-16 IN X 16 IN (400 MM X 400 MM)	3.00	EACH		\$	
1070	23202EC		TEE-24 IN X 16 IN (600 MM X 400 MM)	1.00	EACH		\$	
1080	23358EC		TEE-6 IN X 6 IN (150 MM X 150 MM)	1.00	EACH		\$	
1090	23363EC		LEAK DETECTION ASSEMBLY (WITH GATE VALVE, 24 IN / 600 MM)	1.00	EACH		\$	
1100	23493EC		AIR RELEASE VALVE-2 IN (50 MM)	3.00	EACH		\$	
1110	23699EC		STEEL ENCASEMENT PIPE-30 IN (760 MM)	262.00	LF		\$	
1120	23700EC		STEEL ENCASEMENT PIPE-42 IN (1060 MM)	79.00	LF		\$	
1130	23997EC		TEE-16 X 6 IN (400 MM X 150 MM)	2.00	EACH		\$	
1140	24011EC		BEND 22.5 DEG-24 IN (600 MM)	1.00	EACH		\$	
1150	24012EC		BEND 11.25 DEG-24 IN (600 MM)	5.00	EACH		\$	
1160	24065EC		TEE-16X12 IN (400 MM X 300 MM)	1.00	EACH		\$	
1170	24486ED		TEE (24 IN X 12 IN / 600 MM X 300 MM)	3.00	EACH		\$	
1180	24486ED		TEE (24 IN X 24 IN / 600 MM X 600 MM)	2.00	EACH		\$	
1190	24648EC		FOSTER ADAPTER (6 INCH / 150 MM)	2.00	EACH		\$	
1200	24700EC		DUCTILE IRON CROSS (12 IN X 12 IN / 300 MM X 300 MM)	1.00	EACH		\$	
1210	24700EC		DUCTILE IRON CROSS (24 IN X 24 IN / 600 MM X 600 MM)	1.00	EACH		\$	
1220	24700EC		DUCTILE IRON CROSS (16 IN X 16 IN / 400 MM X 400 MM)	1.00	EACH		\$	
1230	24723EC		PRESSURE PLANE VALVE (16 IN / 400 MM)	1.00	EACH		\$	
1240	24724EC		PLUG-16 IN (400 MM)	2.00	EACH		\$	

Section: 0015 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	FP	AMOUNT
1250	02568		MOBILIZATIO	1.00	LS		\$	
1260	02569		DEMOBILIZATIO	1.00	LS		\$	