CALL NO. 105

CONTRACT ID. 121329

JEFFERSON COUNTY

FED/STATE PROJECT NUMBER IM 0642 (178)

DESCRIPTION I-64 AND HURSTBOURNE PARKWAY INTERCHANGE

WORK TYPE GRADE & DRAIN WITH ASPHALT SURFACE

PRIMARY COMPLETION DATE 11/15/2012

LETTING DATE: June 15, 2012

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN DAYLIGHT TIME June 15, 2012. Bids will be publicly announced at 10:00 AM EASTERN DAYLIGHT TIME.

ROAD PLANS

DBE CERTIFICATION REQUIRED - 7%

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

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PART I

SCOPE OF WORK

CONTRACT ID - 121329 ADMINISTRATIVE DISTRICT - 05

PROJECT(S) IDENTIFICATION AND DESCRIPTION:

COUNTY - JEFFERSON PCN - DE05600641229
IM 0642 (178)
I-64 AND HURSTBOURNE PARKWAY INTERCHANGE IMPROVE THE INTERCHANGE RAMPS AT I-64, HURSTBOURNE PARKWAY AND BLUEGRASS PARKWAY, A DISTANCE OF 1.35 MILES. GRADE & DRAIN WITH ASPHALT SURFACE. SYP NO. 05-00052.00.
GEOGRAPHIC COORDINATES LATITUDE 38^13'25" LONGITUDE 85^34'44"

COMPLETION DATE(S):
COMPLETION DATE - November 15, 2012
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/contract)

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.

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.

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)

10/18/2011

FEDERAL CONTRACT NOTES

The Kentucky Department of Highways, in accordance with the Regulations of the United States Department of Transportation 23 CFR 635.112 (h), hereby notifies all bidders that failure by a bidder to comply with all applicable sections of the current Kentucky Standard Specifications, including, but not limited to the following, may result in a bid not being considered responsive and thus not eligible to be considered for award:

102.02 Current Capacity Rating 102.10 Delivery of Proposals
102.08 Irregular Proposals 102.14 Disqualification of Bidders
102.09 Proposal Guaranty

CIVIL RIGHTS ACT OF 1964

The Kentucky Department of Highways, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the Federal Department of Transportation (49 C.F.R., Part 21), issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the ground of race, color, or national origin.

NOTICE TO ALL BIDDERS

To report bid rigging activities call: 1-800-424-9071.

The U.S. Department of Transportation (DOT) operates the above toll-free “hotline” Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the “hotline” to report such activities.

The “hotline” is part of the DOT’s continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

FHWA 1273

Contrary to Paragraph VI of FHWA 1273, contractors on National Highway System (NHS) projects of $1 million or more are no longer required to submit Form FHWA-47.

Contrary to Form FHWA-1273, Section V, paragraph 2.b personal addresses and full social

security numbers (SSN) shall not be included on weekly payroll submissions by contractors and subcontractors. Contractors and subcontractors shall include the last four digits of the employee's SSN as an individually identifying number for each employee on the weekly payroll submittal. This in no way changes the requirement that contractors and subcontractors maintain complete SSN and home addresses for employees and provide this information upon request of KYTC, FHWA, and the U.S. Department of Labor.

SECOND TIER SUBCONTRACTS

Second Tier subcontracts on federally assisted projects shall be permitted. However, in the case of DBE's, second tier subcontracts will only be permitted where the other subcontractor is also a DBE. All second tier subcontracts shall have the consent of both the Contractor and the Engineer.

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

It is the policy of the Kentucky Transportation Cabinet ("the Cabinet") that Disadvantaged Business Enterprises ("DBE") shall have the opportunity to participate in the performance of highway construction projects financed in whole or in part by Federal Funds in order to create a level playing field for all businesses who wish to contract with the Cabinet. To that end, the Cabinet will comply with the regulations found in 49 CFR Part 26, and the definitions and requirements contained therein shall be adopted as if set out verbatim herein.

The Cabinet, contractors, subcontractors, and sub-recipients shall not discriminate on the basis of race, color, national origin, or sex in the performance of work performed pursuant to Cabinet contracts. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted highway construction projects. The contractor will include this provision in all its subcontracts and supply agreements pertaining to contracts with the Cabinet.

Failure by the contractor to carry out these requirements is a material breach of its contract with the Cabinet, which may result in the termination of the contract or such other remedy as the Cabinet deems necessary.

DBE GOAL

The Disadvantaged Business Enterprise (DBE) goal established for this contract, as listed on the front page of the proposal, is the percentage of the total value of the contract.

The contractor shall exercise all necessary and reasonable steps to ensure that Disadvantaged Business Enterprises participate in a least the percent of the contract as set forth above as goals for this contract.

OBLIGATION OF CONTRACTORS

Each contractor prequalified to perform work on Cabinet projects shall designate and make known to the Cabinet a liaison officer who is assigned the responsibility of effectively administering and promoting an active program for utilization of DBEs.

If a formal goal has not been designated for the contract, all contractors are encouraged to consider DBEs for subcontract work as well as for the supply of material and services needed to perform this work.

Contractors are encouraged to use the services of banks owned and controlled by minorities and women.

CERTIFICATION OF CONTRACT GOAL

Contractors shall include the following certification in bids for projects for which a DBE goal has been established. BIDS SUBMITTED WHICH DO NOT INCLUDE CERTIFICATION OF DBE PARTICIPATION WILL NOT BE ACCEPTED. These bids will not be considered for award by the Cabinet and they will be returned to the bidder.

"The bidder certifies that it has secured participation by Disadvantaged Business Enterprises ("DBE") in the amount of ____ percent of the total value of this contract and that the DBE participation is in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet pertaining to the DBE Program."

The certification statement is located in the electronic bid file. All contractors must certify their DBE participation on that page. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted.

DBE PARTICIPATION PLAN

Lowest responsive bidders must submit the *DBE Plan/ Subcontractor Request,* form TC 63-35 DBE, within 10 days of the letting. This is necessary before the Awards Committee will review and make a recommendation. **The project will not be considered for award prior to submission and approval of the apparent low bidder's DBE Plan/Subcontractor Request.**

The DBE Participation Plan shall include the following:

1 Name and address of DBE Subcontractor(s) and/or supplier(s) intended to be used in the proposed project;
2 Description of the work each is to perform including the work item , unit, quantity, unit price and total amount of the work to be performed by the individual DBE. The Project Code Number (PCN), Category Number, and the Project Line Number can be found in the "material listing" on the Construction Procurement website under the specific letting;
3 The dollar value of each proposed DBE subcontract and the percentage of total project contract value this represents. DBE participation may be counted as follows; a) If DBE suppliers and manufactures assume actual and contractual responsibility, the dollar value of materials to be furnished will be counted toward the goal as follows:

- The entire expenditure paid to a DBE manufacturer;
- 60 percent of expenditures to DBE suppliers that are not manufacturers provided the supplier is a regular dealer in the product involved. A regular dealer must be engaged in, as its principal business and in its own name, the sale of products to the public, maintain an inventory and own and operate distribution equipment; and
- The amount of fees or commissions charged by the DBE firms for a bona fide service, such as professional, technical, consultant, or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials, supplies, delivery of materials and supplies or for furnishing bonds, or insurance, providing such fees or commissions are determined to be reasonable and customary.

b) The dollar value of services provided by DBEs such as quality control testing, equipment repair and maintenance, engineering, staking, etc.;
c) The dollar value of joint ventures. DBE credit for joint ventures will be limited to the dollar amount of the work actually performed by the DBE in the joint venture;
4 Written and signed documentation of the bidder's commitment to use a DBE contractor whose participation is being utilized to meet the DBE goal; and
5 Written and signed confirmation from the DBE that it is participating in the contract as provided in the prime contractor's commitment.

UPON AWARD AND BEFORE A WORK ORDER WIL BE ISSUED

Contractors must submit the signed subcontract between the contractor and the DBE contractor, the DBE's certificate of insurance, and an affidavit for bidders, offerors, and contractors from the DBE to the Division of Construction Procurement. The affidavit can be found on the Construction Procurement website. If the DBE is a supplier of materials for the project, a signed purchase order and an affidavit for bidders, offerors, and contractors must be submitted to the Division of Construction Procurement.

Changes to DBE Participation Plans must be approved by the Cabinet. The Cabinet may consider extenuating circumstances including, but not limited to, changes in the nature or scope of the project, the inability or unwillingness of a DBE to perform the work in accordance with

the bid, and/or other circumstances beyond the control of the prime contractor.

CONSIDERATION OF GOOD FAITH EFFORTS REQUESTS

If the DBE participation submitted in the bid by the apparent lowest responsive bidder does not meet or exceed the DBE contract goal, the apparent lowest responsive bidder must submit a Good Faith Effort Package to satisfy the Cabinet that sufficient good faith efforts were made to meet the contract goals prior to submission of the bid. Efforts to increase the goal after bid submission will not be considered in justifying the good faith effort, unless the contractor can show that the proposed DBE was solicited prior to the letting date. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted. One complete set and nine (9) copies of this information must be received in the office of the Division of Contract Procurement no later than 12:00 noon of the tenth calendar day after receipt of notification that they are the apparent low bidder.

Where the information submitted includes repetitious solicitation letters it will be acceptable to submit a sample representative letter along with a distribution list of the firms solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal as necessary to demonstrate compliance with the factors listed below which the Cabinet considers in judging good faith efforts. This documentation may include written subcontractors' quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

The Good Faith Effort Package shall include, but may not be limited to information showing evidence of the following:

1 Whether the bidder attended any pre-bid meetings that were scheduled by the Cabinet to inform DBEs of subcontracting opportunities;
2 Whether the bidder provided solicitations through all reasonable and available means;
3 Whether the bidder provided written notice to all DBEs listed in the DBE directory at the time of the letting who are prequalified in the areas of work that the bidder will be subcontracting;
4 Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainly whether they were interested. If a reasonable amount of DBEs within the targeted districts do not provide an intent to quote or no DBEs are prequalified in the subcontracted areas, the bidder must notify the DBE Liaison in the Office of Minority Affairs to give notification of the bidder's inability to get DBE quotes;
5 Whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise perform these work items with its own forces;
6 Whether the bidder provided interested DBEs with adequate and timely information about the plans, specifications, and requirements of the contract;
7 Whether the bidder negotiated in good faith with interested DBEs not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any

rejection should be so noted in writing with a description as to why an agreement could not be reached;

8 Whether quotations were received from interested DBE firms but were rejected as unacceptable without sound reasons why the quotations were considered unacceptable. The fact that the DBE firm's quotation for the work is not the lowest quotation received will not in itself be considered as a sound reason for rejecting the quotation as unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a DBE quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy DBE goals;

9 Whether the bidder specifically negotiated with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be subcontracted includes potential DBE participation;

10 Whether the bidder made any efforts and/or offered assistance to interested DBEs in obtaining the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal; and

11 Any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include DBE participation.

FAILURE TO MEET GOOD FAITH REQUIREMENT

Where the apparent lowest responsive bidder fails to submit sufficient participation by DBE firms to meet the contract goal and upon a determination by the Good Faith Committee based upon the information submitted that the apparent lowest responsive bidder failed to make sufficient reasonable efforts to meet the contract goal, the bidder will be offered the opportunity to meet in person for administrative reconsideration. The bidder will be notified of the Committee's decision within 24 hours of its decision. The bidder will have 24 hours to request reconsideration of the Committee's decision. The reconsideration meeting will be held within two days of the receipt of a request by the bidder for reconsideration.

The request for reconsideration will be heard by the Office of the Secretary. The bidder will have the opportunity to present written documentation or argument concerning the issue of whether it met the goal or made an adequate good faith effort. The bidder will receive a written decision on the reconsideration explaining the basis for the finding that the bidder did or did not meet the goal or made adequate Good Faith efforts to do so.

The result of the reconsideration process is not administratively appealable to the Cabinet or to the United States Department of Transportation.

The Cabinet reserves the right to award the contract to the next lowest responsive bidder or to rebid the contract in the event that the contract is not awarded to the low bidder as the result of a failure to meet the good faith requirement.

SANCTIONS FOR FAILURE TO MEET DBE REQUIREMENTS OF THE PROJECT

Failure by the prime contractor to fulfill the DBE requirements of a project under contract or to demonstrate good faith efforts to meet the goal constitutes a breach of contract. When this occurs, the Cabinet will hold the prime contractor accountable, as would be the case with all other contract provisions. Therefore, the contractor's failure to carry our the DBE contract requirements shall constitute a breach of contract and as such the Cabinet reserves the right to exercise all administrative remedies at its disposal including, but not limited to the following:

- Disallow credit toward the DBE goal;
- Withholding progress payments;
- Withholding payment to the prime in an amount equal to the unmet portion of the contract goal; and/or
- Termination of the contract.

PROMPT PAYMENT

The prime contractor will be required to pay the DBE within seven (7) working days after he or she has received payment from the Kentucky Transportation Cabinet for work performed or materials furnished.

CONTRACTOR REPORTING

All contractors must keep detailed records and provide reports to the Cabinet on their progress in meeting the DBE requirement on any highway contract. These records may include, but shall not be limited to payroll, lease agreements, cancelled payroll checks, executed subcontracting agreements, etc. Prime contractors will be required to submit certified reports on monies paid to each DBE subcontractor or supplier utilized to meet a DBE goal.

Payment information that needs to be reported includes date the payment is sent to the DBE, check number, Contract ID, amount of payment and the check date. Before Final Payment is made on this contract, the Prime Contractor will certify that all payments were made to the DBE subcontractor and/or DBE suppliers.

The Prime Contractor should supply the payment information at the time the DBE is compensated for their work. Form to use is located at:
http://transportation.ky.gov/Construction/Pages/Subcontracts.aspx

Photocopied payments and completed form to be submitted to: Office of Civil Rights and Small Business Development 6th Floor West 200 Mero Street Frankfort, KY 40622

DEFAULT OR DECERTIFICATION OF THE DBE

If the DBE subcontractor or supplier is decertified or defaults in the performance of its work, and

the overall goal cannot be credited for the uncompleted work, the prime contractor may utilize a substitute DBE or elect to fulfill the DBE goal with another DBE on a different work item. If after exerting good faith effort in accordance with the Cabinet's Good Faith Effort policies and procedures, the prime contractor is unable to replace the DBE, then the unmet portion of the goal may be waived at the discretion of the Cabinet.

09/14/11

NATIONAL HIGHWAY

Be advised this project is on the NATIONAL HIGHWAY SYSTEM.

PROJECT TRAFFIC COORDINATOR (PTC)

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

FUEL AND ASPHALT PAY ADJUSTMENT

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

OPTION A

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

SPECIAL PROVISION FOR WASTE AND BORROW SITES

Obtain U.S. Army Corps of Engineer's approval before utilizing a waste or borrow site that involves "Waters of the United States". The Corps of Engineers defines "Waters of the United States" as perennial or intermittent streams, ponds or wetlands. The Corps of Engineers also considers ephemeral streams, typically dry except during rainfall but having a defined drainage channel, to be jurisdictional waters. Direct questions concerning any potential impacts to "Waters of the United States" to the attention of the appropriate District Office for the Corps of Engineers for a determination prior to disturbance. Be responsible for any fees associated with obtaining approval for waste and borrow sites from the U.S. Army Corps of Engineer or other appropriate regulatory agencies.

1-296 Waste & Borrow Sites
01/02/2012

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: May 18, 2012

Project Name: Hurstbourne Interchange
Letting Date:
Project #: FD52 056 6566301R
County: Jefferson
Item #: 05-52.00
Federal #: IM 0642 (178)

Description of Project: Reconstruct I-64 / Hurstbourne Parkway Interchange and ramps and other needed improvements to Hurstbourne Parkway.

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	Ron Geveden	5/18/12	Right-of-Way Supervisor
	Printed Name	Signature		
Approved:	Keith McDonald	Keith McDonald	5/17/12	KYTC, Director of ROW &Utilities
	Printed Name	Signature		
Approved:	David Whitworth		5/23/12	FHWA, ROW Officer (when applicable)
	Printed Name	Signature		

Right-of-Way Certification Form

Revised 2/22/11

Date: May 18, 2012

Project Name: Hurstbourne Parkway Interchange
Project #: FD52 056 6566301R
Item #: 05-52.00
Letting Date: June 15, 2012

County: Jefferson
Federal #: IM 0642 (178)

This project has 6 total number of parcels to be acquired, and 0 total number of individuals or families to be relocated, as well as 0 total number of businesses to be relocated.

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

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

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

6 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
All		All Parcels have signed, Payments are being processed.	Expected Check Delivery 06-10-2012

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

JEFFERSON COUNTY, IM 64-2(175) AND IM 64-2(176)
FD52 056 65663 01U
LOUISVILLE-LEXINGTON ROAD (I-64)/RECONSRUCT RAMP FROM WB I-64 TO HURSTBOURNE LANE AND NB HURSTBOURNE LANE TO WB I-64
SYP ITEM NUMBER: 5-0052.00

GENERAL PROJECT NOTE ON UTILITY PROTECTION

Insert general notes as below for projects where no utility impact expected

Any work pertaining to these utility facilities is defined in the bid package and is to be carried out as instructed by the Kentucky Transportation Cabinet. The contactor will be responsible for any coordination or adjustments that are discussed or quantified in the proposal.

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

AT&T Legacy—has buried fiber optic lines running North of the Right-of-Way line along the Rt. station side of Ramp 5. This buried line crosses underneath Hurstbourne Parkway at approximate Station 55+18(+/-) and proceeds eastward running North of the Right-of-Way line along the Rt. Station side of Ramp 6. This facility is not to be disturbed and will remain in place.

Metropolitan Sewer District (MSD)—has an 8-inch sanitary sewer that is within the Right-of-Way and runs parallel to Hurstbourne Parkway on the Rt. station side of the roadway. This line starts at a manhole at approximate Rt. Station 59+15 (+/-) and runs northward thru the project limits at the north end. This facility is not to be disturbed and will remain in place.

LG&E (gas)—has an 8-inch gas line that is within the Right-of-Way and runs parallel to Hurstbourne Parkway on the Lt. station side of this roadway throughout the project limits. This 8-inch line crosses Hurstbourne Parkway at three (3) locations; at approximate Station 57+40 (+/-), at approximate Station 59+05 (+/-) and at approximate Station 70+15 (+/-). In addition, there is a segment of 6-inch gas line in the right-of-Way on the Rt. Station side of Hurstbourne Parkway from approximate Rt. Station 56+30 (+/-) to approximate Rt. Station 57+40. This 6-inch gas line becomes an 8-inch gas line at Rt. Station 57+40. This 8-inch gas line remains within the Right-of-Way and runs parallel to Hurstbourne Parkway from approximate Rt. Station 57+40 (+/-) northward thru the remainder of the project. There are four (4) tie-ins that run eastward from this 8-inch gas main; they are located at approximate Rt. Station 59+05 (+/-), at approximate Rt. Station 62+40 (+/-), at approximate Rt. Station 66+35 (+/-) and at approximate Rt. Station 69+20 (+/-). In addition, there is a 4 inch gas main that runs in the Right-of-Way between Ramp 4 and Bluegrass Parkway from approximate (Bluegrass Parkway) Lt. Station 28+00 (+/-) to approximate (Bluegrass Parkway) Lt. Station 31+60; where it crosses under Bluegrass Parkway at a skew. All of these facilities are not to be disturbed and will remain in place.

LG&E (electric)—has overhead facilities consisting of both transmission and distribution lines within the Right-of-Way that run approximately parallel to Hurstbourne Parkway on the Lt. Station side of the road throughout the project limits. There are six (6) overhead crossings over Hurstbourne Parkway at approximate Station 37+60 (+/-), at approximate Station 40+55 (+/-), at approximate Station 45+25 (+/-), at approximate Station 46+55 (+/-), at approximate Station 55+00 (+/-) and at approximate Station 58+60 (+/-). In addition, there are overhead facilities consisting of both transmission and distribution lines within the Right-of-Way that run parallel to Hurstbourne Parkway on the Rt. Station side of the road. This facility starts at the crossing at approximate Rt. Station 40+55 (+/-) and runs southward thru

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the project limits. There is one overhead crossing over Ramp 4 at approximate Station 402+30 (+/-); this same line also crosses over Bluegrass Parkway at approximate Station 28+00 (+/-). There is also an overhead crossing over Ramp 4 at approximate Station 400+40 (+/-); this same line also crosses over Bluegrass parkway at approximate Station 27+65 (+/-). In addition, there is an overhead line running along the Rt. Station side of Bluegrass Parkway from the beginning of the project thru to approximate Rt. Station 32+00 (+/-). All of these facilities are not to be disturbed and will remain in place.

AT&T KY—has a buried line within the Right-of-Way that runs parallel to Hurstbourne Parkway on the Lt. Station side of the road. This line begins at approximate Lt. Station 60+55 (+/-) and runs northward thru the end of the project. This line has one (1) crossing underneath Hurstbourne Parkway at approximate Station 69+15 (+/-). In addition, AT&T KY has aerial facilities that are mounted on the LG&E poles on the Lt. Station side of Hurstbourne Parkway thru the project limits. AT&T KY also has overhead facilities mounted on the LG&E poles on the RT. Station side of Bluegrass Parkway. All of these facilities are not to be disturbed and will remain in place.

Time-Warner Cable (Insight)—has aerial facilities that are mounted on the LG&E poles on the Lt. Station side of Hurstbourne Parkway thru the project limits. All of these facilities are not to be disturbed and will remain in place.

Louisville Water Company—has an 8-inch water main in the Right-of-Way along Hurstbourne Parkway that extends northward from Hurstbourne Park Boulevard to approximate Lt. Station 39+50, where it becomes a 6-inch water line. This 6-inch line terminates at a fire hydrant in the Right-of-Way at approximate Lt. Station 43+35. There is a 12-inch water line crossing under Hurstbourne Parkway at approximate Station 38+23. There is an 8-inch water line in the Right-of-Way that runs parallel along Hurstbourne Parkway from on the Rt. Station side northward to approximate Rt. Station 38+40. There is a 12-inch water line in the Right-of-Way that runs along the Rt. Station side of Hurstbourne Parkway northward from approximate Rt. Station 35+00 to approximate Rt. Station 36+45. There is a 6-inch water line crossing under Hurstbourne Parkway at approximate station 55+88. this 6-inch line extends northward in the Right-of-Way from the crossing at approximate Rt. Station 55+88 and runs parallel to Hurstbourne Parkway and ends at approximate Rt. Station 60+30. There is an 8-inch water line in the Right-of-Way that runs parallel to Hurstbourne Parkway from Rt. Station 67+05 that runs northward past the northern project limits. There is a 36-inch water line that crosses under Hurstbourne Parkway at approximate Station 70+27, and there is a 12-inch water line that crosses under Hurstbourne Parkway at approximate Station 70+32. There is a 6-inch water line in the Right-of-Way that runs southward from approximate Lt. Station 56+85 to approximate Lt. Station 55+90. There is a 12-inch water line in the Right-of-Way from approximate Lt. Station 68+45 northward to the 12-inch crossing at approximate Lt. Station 70+35. All of these facilities are not to be disturbed and will remain in place.

TW Telecom—has aerial facilities mounted on the LG&E poles. These facilities approach the southern project limit on the Rt. station side of Hurstbourne Parkway and proceeds northward parallel to the

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road. It crosses over to the Lt. station side of Hurstbourne Parkway at approximate Station 45+25, and then proceed northward parallel to the road past the northern project limit.

Jefferson County Public School (JCPS)—has an aerial communication line mounted on the LG&E poles alongside Hurstbourne Parkway. These facilities approach the southern project limit on the Rt. station side of Hurstbourne Parkway and proceeds northward parallel to the road. It crosses over to the Lt. station side of Hurstbourne Parkway at approximate Station 40+55, and then proceeds northward parallel to the road past the northern project limit.

Windstream (formerly KDL)—has an aerial fiber optic line attached to the LG&E pole on the northwest corner of the intersection of Linn Station Road at Hurstbourne Parkway. This line approaches the project from the north, and this facility drops at the aforementioned LG&E pole and crosses eastward underneath Hurstbourne Parkway at approximate Station 70+25 and runs eastward approximately parallel to Linn Station Road. This facility is to 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

Time-Warner (Insight)—has a buried cable that runs in the Right-of-Way between Ramp 4 and Bluegrass Parkway from approximate (Bluegrass Parkway) Lt. Station 28+00 (+/-) to a junction box at approximate (Bluegrass Parkway) Lt. Station 32+10 (+/-). This line is being lowered and re-aligned from approximate Lt. Station 30+05 (+/-) to approximate Lt. Station 31+40 (+/-). The re-aligned portion of this cable will be installed under the proposed approximate curb line along the Lt. Station side of Bluegrass Parkway.

Time-Warner (Insight) leased to Level 3—has a buried cable that runs in the Right-of-Way between Ramp 4 and Bluegrass Parkway throughout the project limits. This line runs approximately parallel to Bluegrass Parkway. This line is being lowered and re-aligned from approximate Lt. Station 30+05 (+/-) to approximate Lt. Station 31+40 (+/-). The re-aligned portion of this cable is installed approximately 2 feet behind the back-of-curb along the Lt. Station side of Bluegrass Parkway.

LG&E (electric)—the anchor and guy line configuration at the intersection of **Blairwood Road at Hurstbourne Parkway** has been altered. A new anchor will be installed at the transmission pole located at approximate Lt. Station 55+80; the new anchor will extend southward from this pole. A spanning guy line will be installed between the pole at approximate Lt. Station 55+80 and the pole at approximate Lt. Station 57+40. The existing LG&E guy anchors at approximate Lt. Station 57+40 will be removed. An H-beam will be set at Rt. Station 57+44.25 and a spanning guy line will be installed from this pole to the existing pole at approximate Lt. Station 57+40. The anchor and guy configuration for **the crossing over Hurstbourne Parkway at approximate Station 67+00** has also been adjusted. The existing anchor pole at approximate Rt. Station 67+03 will be removed and replaced with a taller anchor pole. The overhead guying span at approximate Station 67+00 will be reset accordingly from the new anchor pole to the

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existing pole at approximate Lt. Station 66+96. The existing anchor at approximate Rt. Station 67+03 has been removed and a replacement anchor has been reset accordingly.

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

Level 3—has buried facilities underneath the edge of the paved shoulder of Southbound Hurstbourne Parkway from approximated Lt. Station 70+00 (+/-) proceeding southward to approximate Lt. Station 47+30 (+/-). This line will be relocated such that it is placed under the proposed sidewalk within these limits. This work will be completed on or before Friday, August 10, 2012.

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

Louisville Water Company (LWCo)—has a 24-inch transmission line that runs parallel to Hurstbourne Parkway. This line enters the project from the south project limit and runs continuously thru the project and continues northward past the north project limit. The portion of this 24-inch transmission line from approximate Lt. Station 42+45 is to be removed and replaced with a 36-inch transmission line (this is a betterment). In addition, a portion of the 24-inch transmission line from approximate Lt. Station 50+65 to approximate Lt. Station 70+55 is to be removed and replaced with a 36-inch transmission line (this is a betterment). The proposed 36-inch transmission line will tie-in with an existing 6-inch water line at approximate Lt. Station 56+30; a portion of this 6-inch water line will be reconfigured accordingly. The proposed 36-inch transmission line will also tie-in with the existing 36-inch crossing at approximate Lt. Station 72+30.

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SPECIAL CAUTION NOTE – PROTECTION OF UTILITIES

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

The Kentucky Transportation Cabinet makes no guarantees regarding the existence of utilities, the location of utilities, the utility companies in the project scope, or the potential for conflicts encountered during construction. Any location of utilities provided herein has been furnished by the facility owners, field inspection, and/or reviewing record drawings. The accuracy of the information provided is undetermined. It will be the contractor's responsibility to locate utilities before excavating. If necessary, the roadway contractor shall determine the exact location and elevation of utilities by hand digging to expose utilities before excavating in the area of a utility.

BEFORE YOU DIG

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

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

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Utility Owners and Contact Persons
For Jefferson County

1. LG&E KU (Electric)
820 West Broadway
Louisville, KY 40202
LG&E Emergency Number (502) 589-1444
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
Emergency Number (502) 589-5511

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. AT&T KY
3719 Bardstown Road - 2nd Floor
Louisville, KY 40218

Morgan Herndon
Morgan.Herndon@att.com
(502) 458-7312

5. Metropolitan Sewer District
700 West Liberty Street
Louisville, KY 40203-1911

Steve Emly
Emly@MSDLouky.org
(502)540-6509
Brad Selch
SelchB@MSDLouky.org
(502) 540-6614
Send to both contacts

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6. Insight Communications Company
4701 Commerce Crossings Dr.
Louisville, KY40229

Deno Barbour
Cell: (502) 664-7395
Office (502) 357-4376
Dwight.Barbour@TWCable.com

OR

Nathen Howerton
Cell: (502) 639-6838
Office: (502) 357-4318
Nathen.Howerton@TWCable.com

OR

Forrest Antique
Cell: (502) 817-6519
Office: (502) 357-4724
Forrest.Antique@TWCable.com

7. Texas Gas Transmission Corporation
10327 Gaslight Way
Louisville, KY 40299

John Weaver
(502) 438-2407
John.Weaver@BWPMLP.com

8. Marathon Pipeline, LLC
539 S Main St, Rm 7642
Findlay, OH 45840

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

9. Indiana Gas Company Inc
d.b.a. Vectren Energy Delivery of Indiana, Inc
or
Ohio River Pipeline Corporation
2520 Lincoln Drive
Clarksville, Indiana 47129

Mary Barber
MBarber@Vectren.com
(812) 948-4952

Line Maintained By
Texas Gas Transmission, LLC
3800 Frederica Street
Owensboro, Kentucky 42302
Cell: (270) 485-1152

Tim Turner
(270) 688-6461
Tim.Turner@bwpmlp.com

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10.	Indiana Utilities Corporation 123 West Chestnut Street Corydon, Indiana 47112 (812) 738-3235	Kevin Kinney Ron Timberlake Jackie Rogers JackieR@IndianaUtilitiesCorp.com
11.	Sprint - Fiber Optics 11370 Enterprise Park Dr. Sharonville, OH 45241	Joe Thomas Joe.Thomas@Ericsson.com Office (513) 612-4204 Cell (937) 209-9754
12.	Mid-Valley Pipeline Company 4910 Limaburg Road Burlington, KY 41005 FAX (866) 699-1185	Todd Calfee (Richard) (859) 371-4469x14 (859) 630-8271 RTCALFEE@SunocoLogistics.com
13.	Level 3 Communications (Transmission) 848 S. 8th St. Louisville, KY 40203	Kevin Webster Kevin.Webster@Level3.com Office (502) 777-8622 Cell (502) 777-8622 Fax (502) 561-6950
	Level 3 Communications (Transmission) 848 S. 8th St. Louisville, KY 40203	Tim Morphew Tim.Morphew@Level3.com Office (502) 561-6935 Cell (502) 221-1785 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 **Send to all 3 contacts**

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14. Jefferson County Public Schools (JCPS)
C B Young
Building 7
3001 Crittenden Dr.
Louisville. KY 40209

Jeff Hardy
Jeff.Hardy@Jefferson.kyschools.us
502-485-7975

15. Kentucky Data Link (KDL now Windstream)
Project Manager
3701 Communications Way
Evansville, IN 47715
(Address envelopes ATTN Melissa Gugino)

Rick Cunico (Maintenance)
ph: (618) 648-2420
cell: (812) 760-6602
Fax: (812) 456-4731
(812) 759-7844(Maintenance)
Melissa.gugino@windstream.com
WCI.Maintenance.South@windstream.com
Timothy Gibson (Fiber location/relocation)
Timothy.Gibson@Windstream.com
(812) 454-6756
Send to both contacts

16 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
Send to both contacts

17. TWTelecom
Medinger Tower
462 S. 4th St., Suite 2400
Louisville, KY 40202

Jeremy Cornell
Jeremy.Cornell@TWTelecom.com
(502) 992-1168

333 West Vine Street, Suite 330
Lexington, KY 40507

Gerald Long
Gerald.Long@TWTelecom.com

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(859) 550-2201

18. City of Taylorsville Sewer & Water
70 Taylorsville Rd., P O Box 279
Taylorsville, KY 40071

Harold Compton
HCompton@TaylorsvilleWater.org
(502) 477-3235
Fax: (502) 477-1310

19. 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

20. Shelby Energy Cooperative
P.O. Box 311, 620 Old Finchville Road
Shelbyville, KY 40065
(502) 633-4420

Jason Ginn
Jason@ShelbyEnergy.com
cell: (502) 643-2778

21. Atmos Energy
130 Stonecrest Road Suite105
Shelbyville, KY 40065

Bernie Anderson
cell: (502) 321-8073
Bernie.Anderson@AtmosEnergy.com
(502) 633-2831 ext. 104

OR

Earl Taylor
Earl.Taylor@AtmosEnergy.com
Cell: 859-583-0306
Office: 859-236-2300
Send to both contacts

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22. Crown Castle Network Operations
10170 Linn Station Road
Suite 525
Louisville, KY 40223
(builds cell towers and leases space on them)

Brian Watkins
Brian.Watkins@CrownCastle.com
(502) 318-1323
Brandy Bowling (Brian's supervisor)
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

23. Zayo
701 W. Henry Street
Suite 201
Indianapolis, IN 46225

Bill Hales
Bill.Hales@zayo.com
(502) 500-3661

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

OR

Chris Fowler
chris.fowler@verizon.com
Office: (317) 685-8050
Cell: (317) 435-6225
Dave Wiley (Field)
(502) 439-8783
dave.wiley@one.verizon.com

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AIRPORT CONTACTS

Steve Stoker (502) 375-7360 – FFA Location Manager
Jack Stauble (502) 664-9637 cell – FFA Location Technician

Chuck Hensley (502) 380-8356 EXT 356 – Construction Manager
Louisville Regional Airport Authority

Andy Hepfinger (502) 329-3706 – UPS Construction
Brian Knesco (502) 741-2922 – UPS Construction

Railroad Companies

1. **C.S.X. Transportation, Inc.**
Contacts:
David Hall, KY Liaison, (502) 815-1865
Milton Holder – crossings – cell (502) 817-2011
John Williams – crossings – cell (502) 376-8745, Office (502) 364-1133
Joe Malandruco (Florida) – signals (904) 245-1160

2. Norfolk - Southern Railway Company
Norfolk - Southern Railway Company (Roy Johnson to provide contact data)
Mr. J. N. Carter, Jr. Chief Engineer
Bridges and Structures
Norfolk Southern Corporation
1200 Peachtree Street
Atlanta, Georgia 30309

3. Paducah and Louisville Railway, Inc.
Gerald Gupton, Office: (270) 444-4386

LOUISVILLE WATER COMPANY

HURSTBOURNE LANE TRANSMISSION MAIN

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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.

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
- Category 4: 20” – 48” Ductile Iron Water Main
- Category 7: 1” and smaller water services
- Category 8: 1.5” and larger water and fire services

TRAFFIC CONTROL

E. This project will be bid and constructed in conjunction with the Kentucky Transportation Cabinet’s (KTC) I-64 and Hurstbourne Lane project; therefore, no KTC permits will be required. 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 iron pipe materials shall be warranted for five (5) years after the iron pipeline is placed in service. Satisfactory performance of the iron 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 Eastern Part Jefferson County, Kentucky along Hurstbourne Parkway near I-64.

1.02 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required for the 36-inch transmission main as shown on the drawings and specified herein.

B. The work shall include but is not necessarily limited to the following:

1. Installation of approximately 2,430 +/- linear feet of 36-inch diameter water main including fittings and appurtenances.

2. Installation of approximately 235 +/- linear feet of 54-inch diameter Casing Pipe using Bore and Jack method.

3. Installation of vaults for drain valves, gate valves, and air release valves.

4. Asphalt and concrete pavement repair and replacement.

5. Traffic control including policing, barricades, signs, warning devices, flaggers, etc.

6. Installation of sedimentation and erosion control measures per standard including submittal of control plan and obtaining the necessary permits and approval.

7. Site Restoration and cleanup work.

8. 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 Project Manager and the KYTC representative. No material shall be delivered to the Site without prior approval of the Project Manager and the KYTC representative.

B. As soon as possible after the Contract has been executed, the Contractor shall submit to the 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 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 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 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 Project Manager the name and address of the registered land surveyor or professional engineer.

B. On request of the KYTC resident engineer or the Project Manager, submit documentation to verify accuracy of field engineering work.

C. Submit certificate to the KYTC resident engineer and 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 Project Manager and KYTC resident engineer.

2. Report to the 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 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 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 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 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 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 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 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 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 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 Project Manager on the previous submission. Additionally, the Contractor shall direct specific attention to any revisions made other than the corrections requested by the Project Manager on previous submissions.

F. Partial submittals may not be reviewed. The 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 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 Project Manager and at the Contractor's expense, based on the Project Manager's then prevailing rates. The Contractor shall reimburse the Louisville Water Company for all such fees invoiced to the Louisville Water Company by the Project Manager. Submittals are required until approved.

2. Any need for more than one resubmission, or any other delay in obtaining 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 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 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 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 Project Manager. Number of copies shall be as directed by the Project Manager but shall not exceed six to the 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 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 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 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 2006 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 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 2004.

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.) CERTIFCATION 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 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 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)
24 -36 Inch Line – 300 psi

Leakage Test Pressure (2 Hours)
24 - 36 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 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:

Amount	Description
2	Approved graduated containers.
2	Pressure gauges.
1	Hydraulic force pump approved by the 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 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 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 50 PPM chorine 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 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 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 Project Manager. The satisfactory quality of water delivered by the new pipeline shall continue for a period of at least two days. Samples will be taken from a tap located and installed in such a way as to prevent outside contamination. Unless otherwise directed, the sample tap shall either be a hose bib, a disconnected service tap or a ¾ copper riser (with stop-cock), which shall be provided by the Contractor. Should the initial treatment fail to achieve the satisfactory quality described above, the original chlorination procedure shall be repeated until satisfactory results are obtained. All testing shall be performed by the Contractor.

F. Special disinfecting procedures shall be used in connections to existing pipelines and where the method outlined above is not practical.

3.06 LABORATORY TESTING

A. The Contractor shall be responsible for all coordination and payment of testing required under this specification section. Within thirty (30) calendar days after Notice-to-Proceed, the Contractor shall furnish the name of the Laboratory proposed to perform the testing as required by this specification section. The testing Laboratory shall be approved/certified by the Commonwealth of Kentucky for this type of testing and is subject to the approval of the 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 designed 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 or 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 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 Project Manager and the KYTC Resident Engineer, in accordance with Section 01300, the proposed methods of construction, including excavation, excavation support systems designs, backfilling and filling and compaction for the various portions of the work. Excavation support system designs shall be prepared by a licensed professional engineer, registered in the Commonwealth of Kentucky, having a minimum of 5 years of professional experience in the design and construction of excavation support systems. Design calculations and drawings will be submitted for record purposes only. Contractor shall remain responsible for adequacy and safety of construction means, methods, and techniques.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C33 – Specification for Concrete Aggregates.

2. ASTM D698 – Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/f (600kN-m/m)

3. ASTM D2487 – Standard Classification of Soils for Engineering Purposes.

4. ASTM D2922 – Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (shallow depth).

5. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

6. ASTM D3017 – Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (shallow depth).

7. ASTM D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

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

1.05 PROTECTION

A. Sheeting and Bracing

1. Furnish, put in place and maintain such sheeting and bracing as may be required: by Federal, State and local safety requirements; to support the sides of excavations; to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction; and to protect adjacent structures from undermining or other damage. If the Project Manager or the KYTC Resident Engineer is of the opinion that at any points sufficient or proper supports have not been provided, he/she may order additional supports put in, and compliance with such order shall not relieve or release the Contractor from his/her responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed. Where soil cannot be properly compacted to fill a void, lean concrete shall be used as backfill.

2. Construct the sheeting outside the neat lines of the foundation, unless indicated otherwise, to the extent deemed desirable for the method of operation. Sheeting shall be plumb and securely braced and tied in position. Sheeting and bracing shall be adequate to withstand all pressures to which the structure or trench will be subjected. Any movement or bulging which may occur shall be corrected to provide the necessary clearances and dimensions.

3. Where sheeting and bracing is required to support the sides of excavations for structures, engage a professional engineer, registered in the Commonwealth of Kentucky, to design the sheeting and bracing. The sheeting and bracing installed shall be in conformity with the design and certification of this shall be provided by the professional engineer. Submit P.E. Certification Form contained in Section 01300 to show compliance with this requirement.

4. Leave in place to be embedded in the backfill all sheeting and bracing not shown on the Drawings but which the 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 Project Manager or the KYTC Resident Engineer may direct that timber used for sheeting and bracing be cut off at any specified elevation. Sheeting directed by the 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 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 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 scopes.

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 Project Manager's and the KYTC Resident Engineer approval and be well graded within the following limits:

Weight of Stone	Percent Finer by Weight
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:

Sieve Size	% Passing
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:

Sieve Size	Percent Finer by Weight

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 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 Project Manager and the KYTC Resident Engineer. The type of material to be used shall be at the 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 Project Manager and the KYTC Resident Engineer before any work is placed thereon.

C. If, in the opinion of the 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 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 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 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 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 Project Manager and the KYTC Resident Engineer shall be notified and will inspect conditions. If materials and conditions are not satisfactory to the Project Manager or the KYTC Resident Engineer, the 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 Project Manager and the KYTC Resident Engineer for review.

1.02 RELATED WORK

A. Granular fill materials are included in Section 02200.

B. Dewatering is included in Section 02140.

C. Seeding is included in Section 02933.

D. Pavement repair and resurfacing is included in Section 02576.

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 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 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 Project Manager or the KYTC Resident Engineer. When removal of surplus materials has been approved by the 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 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 recompacted 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 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 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 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 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 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 fro 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 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 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 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 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 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 Project Manager and the KYTC Resident Engineer at least 5 working days prior to placing concrete during manufacturing process. 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 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 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 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 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 Tesile 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 thus 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 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 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 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 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, hooks, pipe tongs or other devices acceptable to the 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 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 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. 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 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 pipe manufacturer shall comply with the restrained joint system indicated on the drawings. Any deviations from the plans require prior Project Manager and the KYTC Resident Engineer approval and the proposed drawing and calculations stamped by a Registered Professional Engineer licensed in Kentucky must be submitted to LWC in advance.

2. Pipe joints for the 36-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 36-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 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 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 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 fir 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 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 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:

Bolt Size	Torque Range (Foot-Pounds)
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 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 Project Manager. Submit the plan for testing to the 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 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 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:

Outside Diameter	Nominal Metal Thickness
54.00"	0.625"
48.00"	0.500"

F. Circumference – The outside circumference of the pipe shall not vary more than + or – 1%, but not exceeding + or – ¾" 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 ½ inch per length of pipe.

I. All ID obstructions (bead welds, slags, etc.) shall not extend more than 3/32" from the ID face.

J. Each length of pipe shall be legibly marked, stating: manufacturer, grade, diameter, wall thickness and primer.

K. A protective coating shall be applied to the inside and outside of each length of pipe. Following an SSPC SP-7 "Brush-Off Blast Cleaning" surface preparation, 3.0 dry mils of Tnemac Primar 100-99 (red), or of an approved equal, shall be applied in the manner recommended by the respective paint manufacturer.

3.07 QUALITY ASSURANCE

ALLOWABLE TOLERANCES

A. Where grades or elevations are shown on the plans for the pipeline to be installed by open trench, boring, jacking, and tunneling operations, maximum deviation of plan elevation shall be 0.1 foot. The maximum deviation of alignment over the length of the bore shall be 0.1 foot.

B. The Contractor shall have the line and grade of the casing pipe checked after each length of casing pipe is installed.

C. The 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 Project Manager via the KYTC Resident Engineer for approval.

CASING SPACER SUPPLIER

A. Casing spacers and end seals shall me 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. Concrete Joints and Joint Accessories are included in Section 03250.

C. Cast-in-Place Concrete is included in Section 03300.

D. Grout is included in Section 03600.

1.03 SUBMITTALS

A. Submit to the 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 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 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 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 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 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 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 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 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 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 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 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. Concrete Joint and Joint Accessories are included in Section 03250.

C. Cast-in-place Concrete is included in Section 03300.

D. Grout is included in Section 03600.

1.03 SUBMITTALS

A. Submit to the 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 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 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 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 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 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 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 Project Manager and the KYTC Resident Engineer and the Project Manager's release to proceed with the concreting has been obtained. The 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 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 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 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 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 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 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 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 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 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 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)	AE 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 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 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 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 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

Air or Concrete Temperature (whichever is higher)	Maximum Time
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 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 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 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 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 Project Manager or the KYTC Representative may direct the Contractor to immediately cover plastic concrete with sheet material.

3. Discuss with the 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 Project Manager.

3.06 REMOVAL OF FORMS

A. Except as otherwise specifically authorized by the 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

Forms for	Degree Days
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 Project Manager and the KYTC Representative at all times. The Contractor shall advise the Project Manager and the KYTC Resident Engineer of his/her readiness to proceed at least 24 hours prior to each concrete placement. The 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 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 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 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 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 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 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 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 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 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 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 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

Class	Design Strength (psi)	Description
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 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 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 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 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 ¼-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 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 Project Manager and the KYTC Representative.

B. Surfaces which, in the opinion of the 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 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 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 cementitous 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 Project Manager or the KYTC Resident Engineer.

2. Aggregates for use in concrete grout when requested by the 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 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 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 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 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 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 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 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 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 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 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 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-geared valves and shall incorporate packing for geared valves.

c. Provide valve box, 2-inch operating nut and extension stem and stem cover, and tee handled valve wrenches.

B. Air Release and Vacuum Valves

1. Air release and vacuum valves shall be of the size indicated on the Drawings and designed to control the flow of large air volumes both into and out of the pipelines to which they are connected. Valves shall be tight against leakage under a working pressure of 200 psi and shop tested at a pressure of 300 psi.

2. The air release vacuum valve shall be comprised of a small orifice assembly and large orifice assembly housed in a single body. The large orifice assembly shall exhaust air from a pipeline during the initial filling of the pipeline. The large orifice assembly shall not blow shut while exhausting air, even while venting air at sonic velocity. When all air has been exhausted from the pipeline, the large orifice float ball shall be buoyed up to seat tightly against a resilient seat ring. The large orifice float ball shall remain tightly closed while the pipeline is under positive pressure. Should the pipeline pressure fall below atmospheric pressure, the large orifice float ball shall fall away from the seat ring and permit air to enter the pipeline.

The small orifice assembly shall automatically release air accumulations from the pipeline while under positive pressure. When the valve body fills with air, the small orifice float ball falls to open the small orifice and exhaust the air to atmosphere. When the air has been exhausted, the small orifice float shall be buoyed up and tightly close the small orifice. There shall be no baffles, deflectors, or stems.

In addition, each valve shall be furnished with a flanged gate valve for isolation purposes.

3. The valve body and covers shall be of ASTM A126, Class B cast iron construction. Large and small orifice float balls shall be 302 stainless steel, ASTM A240. The float arm, leverage arm and link shall be 304 stainless steel. The pivot pin shall be 18-8 stainless steel.

4. The air release vacuum valves shall be installed in the manner and at the locations as shown on the Drawings. Valves shall be Golden Anderson air and vacuum valve Figure 960 or equal, 2-inch.

C. Self-Centering Alignment Ring

1. All buried valve boxes shall have a two-piece AFC Centering Ring that centers the valve box directly over the valve and aligns the box in a vertical position. The centering ring shall have an adjustable detented slide to compensate for multiple stem diameters. The installation of the alignment ring below the operating nut shall not disturb the function of the nut nor shall the operating nut have to be removed to install the centering ring.

PART 3: EXECUTION

3.01 INSTALLATION

A All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the 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 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 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 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 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 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

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EQUIPMENT AND MATERIALS
All equipment and materials shall be new, free of defects and damage.

SPECIFICATIONS AND WORKMANSHIP
Unless otherwise specified, all work shall conform to the following:

- Kentucky Standard Specifications for Road and Bridge Construction, latest edition.
- FHWA, Manual on Uniform Traffic Control Devices, latest edition.
- National Electrical Code, latest edition.
- National Electric Safety Code, latest edition.
- KYTC Department of Highways Standard Drawings, current editions.
- KYTC Department of Highways Sepia Drawings, current editions.
- International Municipal Signal Association (IMSA) Specification No. 51-7, current edition.
- AASHTO, Roadside Design Guide, latest edition.

- AASHTO, Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, latest edition.

All work shall be performed in a neat and professional manner. The Contractor shall remove debris and trash from work areas during construction. The Contractor shall restore areas to original condition and clean up all debris after construction.

DAMAGE TO EXISTING FACILITIES

The Contractor shall be responsible for locating all underground utilities prior to excavation. The contractor shall repair damage caused to any public or private facilities at his expense. Utilities include but are not limited to telephone, power, water, gas, fiber optic cable, underground vaults, roadway lighting wiring, traffic signal wiring, and roadway drainage systems.

MATERIALS LIST

The contractor shall provide an equipment list in Microsoft Excel format to the Engineer containing the following information:

- Type of equipment
- Field location
- Make
- Model
- Serial number
- Date of purchase
- Manufacturer contact information
- Equipment vendor contact information (if different)
- Date of Installation
- Date warranty expires

This list shall be provided to the Division of Traffic Operations prior to burn-in testing.

WARRANTY

The Contractor shall provide a copy of all equipment warranty information to the Division of Traffic Operations. The Contractor shall provide documentation from the manufacturer that ownership of the warranty is transferred to the following:

Kentucky Transportation Cabinet
Division of Traffic Operations
200 Mero Street
Frankfort, KY 40622

TESTING

The Contractor shall demonstrate proper functioning of all devices at the field cabinets.

A 30 day equipment burn-in test will begin after each device is accepted. If a device fails during the 30 burn-in day test the Contractor shall repair or replace the device and demonstrate that the device is functioning at the field cabinet and a new 30 day burn-in test will begin for that device. Each device will be accepted after it has successfully completed its 30 day test. The 30 day burn-in test will be conducted by TOC personnel in Frankfort from the operations center and consist of operational control of PTZ and video of the remote camera location and sign control.

SHOP DRAWINGS
All items that are used on this project shall have shop drawings sent to Engineer, who will contact Division of Traffic Operations for approval. All items shall be approved before purchase of said items.

AS-BUILT DRAWINGS
The Contractor, at the completion of the project, shall submit as-built drawings. As-built drawings shall be submitted in electronic format such as .pdf, .tiff, .dgn or other standard image format acceptable to the Engineer. As-built drawings may be scanned from marked up field plans or drawn in MicroStation. As-built drawings shall be scanned at a resolution that will allow them to be clearly legible on a computer display. As-built drawings shall include the exact location of all above ground equipment, underground conduit, wire, sensors and other equipment. Drawings shall indicate any changes to the design including changes to the numbers of conductors, wire gage, splices, additional conduit, etc. Conduit locations shall be drawn to scale or shall be dimensioned and referenced to permanent roadway features. Turns in conduit shall be referenced so that the conduit paths may be derived from the as-built drawings. Existing underground utilities shall be indicated on the drawings. Two copies of the drawings shall be submitted. One copy of the drawings shall be submitted to the Engineer. One copy of the drawings shall be submitted to the KYTC Division of Traffic Operations Design Services Branch. The Contractor shall correct any drawings that are deemed unacceptable to the Engineer. As-built drawings shall be delivered prior to burn-in testing.

COMMUNICATIONS CABLE

DESCRIPTION

Furnish and install Communications Cable in accordance with the plans, specifications and Standard Drawings.

MATERIALS

Communications cable shall be General Cable GenSpeed 5000 CAT 5e Outside Plant Cable 8 wire PN: 5136100 or approved equal. The cable shall meet or exceed the following specifications:
Performance:

- ANSI/TIA/EIA 568B (Category 5e)
- MIL-C-24640A Water Penetration

- Propagation Delay: 583 ns @ 100 MHz
- Return Loss @ 100 MHz: 20.1 DB
- Frequency Range: 1-350 MHz

Physical characteristics:

- Nominal Outside Diameter: 0.230 in
- Insulation Type: Polyolefin
- Maximum Pulling Tension: 25 lbs
- Maximum DC Resistance: 9.38 Ohms/100m
- Mutual Capacitance @ 1kHz: 17 pF/100m
- Operating Temperature: -45° C to 80° C

All connectors, terminators, fittings, etc. shall be incidental to the cost of installing the Communications Cable and no separate payment will be made.

INSTALLATION

The Contractor shall install all cable and wire splice-free from the controller/service location to each cabinet, VMS sign, or CCTV camera the cable or wire is feeding. The Contractor shall not use excessive force when pulling wire through duct. The Contractor shall replace all wire damaged during installation. The Contractor shall submit to material testing at the discretion of the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Communications Cable will be measured for payment per unit linear foot The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

CONDUIT

DESCRIPTION

Furnish and install Conduit in accordance with the plans, specifications and Standard Drawings.

MATERIALS

Conduit shall be rigid steel, schedule 40 PVC, or flexible, non-metallic conduit as specified. This item includes fittings, connectors, clamps, caps and other materials necessary for proper installation. The Contractor shall submit to material testing at the discretion of the Engineer.

INSTALLATION

All conduit installed above ground or below ground under pavement shall be rigid steel. All conduits installed below ground, not under pavement shall be PVC. Flexible, non-

metallic conduit shall be used as required and shall be incidental to the project. Unused conduits shall be capped on both ends. Conduit containing wire or cable shall be sealed with a piece of steel wool and capped off with duct seal putty. All conduits shall be accessible inside junction boxes. All conduits shall have bushings included. If rigid steel conduit, the bushings shall be bonded together with other similar types of conduits.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Rigid Steel and PVC Conduit will be measured for payment per unit linear foot. The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section. A direct measurement will not be made for flexible, non-metallic conduit. All flexible, non-metallic conduits shall be incidental to the project.

FIBER OPTIC CABLE AND FIBER TERMINATION RACK

DESCRIPTION

Furnish and install Fiber Optic Cable and Fiber Termination Rack in accordance with the plans, specifications and Standard Drawings.

MATERIALS

The Contractor shall install specified fiber optic cable and distribution equipment using the stated installation procedures. The fiber termination rack shall include rack enclosure (Corning Fiber CCH01 or approved equal), panel modules 12 fiber (Corning Fiber CCHCP1259 or approved equal), and single mode patch cords (Corning Fiber VDX9YYS3FIS or approved equal).

This shall include furnishing and installing all materials, mounting hardware, and cabling necessary to construct a complete and functional system. This shall also include all labor, tools, equipment, and incidentals necessary to complete the work, including but not limited to integrated fiber optic termination units, connector modules, jumper cables, testing, and documentation.

Fiber optic cable, jumper cables, and distribution equipment shall be fabricated by a certified ISO 9001 manufacturer.

All fiber cable provided under this contract shall be from the same manufacturer utilizing identical specifications. Fiber cables shall be dielectric (constructed from non-metallic materials). Fiber cables shall contain single mode optical fibers, loose tube, filled with a water-blocking material, and shall be suitable for installation in underground conduit and field cabinets.

Cable shall be furnished in one continuous length per reel and shall be free from optical splices. A minimum length of six feet on each end of the cable shall be accessible for testing.

All optical fiber in the cable shall, at a minimum, comply with the following requirements:

- Min. Cladding diameter: 125+/- 1.0μm
- Core to cladding offset: 0.8μum maximum
- Maximum attenuation: 0.5 dB/km at 1310 nm
  0.5 dB/km at 1550 nm
- Maximum chromatic dispersion: 3.2 ps/(nm x km) from 1285 nm to 1330nm
  18 ps/(nm x km) at 1550 nm
- Fiber polarization mode dispersion: 0.5 ps/(km), 2 maximum
- Coating diameter: 245 μm +/- 10 μm

The change in attenuation for single-mode from 0° F to -150° F shall not exceed 0.2 dB/km at 1550 nm, with 80 percent of the measured values no greater than 0.1 dB/km at 1550 nm.

The cable design shall have a life expectancy of 20 years when installed to manufacturer's specifications.

Optical fibers shall be contained inside a loose buffer tube. Each buffer tube shall contain 48 fibers. The buffer tubes shall allow free movement of the fibers without fiber damage during installation or normal operation, including expansion and contraction of the buffer tubes. The diameter of all buffer tubes in a cable shall match.

The cable shall have a central member designed to prevent buckling of the cable.

The cable core interstices shall be filled with a non-nutritive to fungus, electrically non-conductive, water-blocking material such as water-swellable tape that is dry to the touch. The water blocking material shall be free from dirt and foreign matter.

The cable shall contain a least one ripcord under the sheath for easy sheath removal.

The cable shall have tensile strength members that minimize cable elongation due to installation forces and temperature. The cable shall withstand a 600 lb. tensile load applied per EIA-455-33. The change in attenuation shall not exceed 0.2 dB during loading and 0.1 dB after loading. The cable shall be rated for a minimum installed tensile service load of 200 lbs.

The cable shall be dielectric (with no armoring) and be either HDPE or MDPE. Jacketing material shall be applied directly over the tensile strength members and water-blocking material.

The markings on the fiber optic cable shall include cable length markings.

The fiber optic cable shall be capable of withstanding the following conditions without damage or decrease in function:

- Cable freezing per EIA/TIA-455-98
- Total immersion in water with natural mineral and salt contents
- Salt spray or salt water immersion for extended periods
- Wasp and hornet spray

Cable shall be furnished in one continuous length per reel and shall be free from optical splices. A minimum length of six feet on each end of the cable shall be accessible for testing.

Information either stenciled or lettered on the reel or provided on a weatherproof tag firmly attached to the reel shall include the following:

- Factory order number
- Job number
- Ship date
- Manufacturer's cable code
- Type of cable (single mode, outdoor, indoor)
- Beginning and ending length markings
- Measured length and attenuation

FIBER OPTIC DISTRIBUTION EQUIPMENT:
SC type Connectors shall used. The measured attenuation of the connector (inclusive of coupler and mated test connector) shall not exceed an average of 0.3 dB for all connectors provided. Any connector found in excess of 0.5 dB will be rejected. Reflectance shall be less than -40 dB, from 14° F to +140° F. The manufacturer shall have a program that periodically tests connectors to ensure that, after 1000 re-matings, the attenuation shall not change more than 0.2 dB.

The connector shall be able to withstand an axial pull of 25 lbs. with no physical damage to the connector and no permanent optical degradation more than 0.3 dB. Connectors shall be pre-wired by the manufacturer.

Fiber optic jumper cables shall, at a minimum, comply with the following requirements:

- Have less than 0.2 dB loss when subjected to EIA/TIA-455-1A, 300 cycles, 0.5 kg
- Have an Aramid yarn strength member
- Have a rugged PVC sheathing
- Have a minimum bend radius of 12.5 inches following installation, 25 inches during installation
- Have a minimum tensile strength of 100 lbs

- Have connectors with strain relief pre-wired by the manufacturer
- Comply with NEC requirements for indoor fiber optic cable

Jumper cables shall be either single or duplex. Duplex jumper cables shall have permanent markings to distinguish between the fibers or connectors.

Connector modules shall consist of a connector panel, couplers, and a protective housing. The measured attenuation of the connector module (inclusive of coupler, fiber, and mated ST test connector) shall not exceed an average of 0.3 dB for all connector modules provided. Any connector module found in excess of 0.5 dB will be rejected. Connector modules shall, at a minimum, comply with the following:

- Have 6 couplers for ST applications
- Have 12 couplers for SC applications
- Have a durable housing that provides physical protection and strain relief for the termination of multi-fiber cable to couplers
- Be easily installed and removed from the termination housing
- Be furnished with protective covers for couplers on the jumper cable side
- Comply with NEC requirements for indoor fiber optic cable

There shall be a fixed correlation between each buffered fiber color and coupler position for all connector modules. Fiber color shall meet the requirements for outdoor fiber optic cable.

Fiber optic termination units shall be properly sized for the required number of terminations subject to the minimum requirements stated for each configuration. The fiber optic termination units shall, at a minimum, comply with the following requirements:

- Be rack mounted
- Have front and rear doors or removable panels
- Have a top, bottom, and 4 sides that fully enclose the interior and protect its contents from physical damage
- Be manufactured using 16 gauge aluminum or equivalent and corrosion resistant
- Have provisions for neatly routing cables, buffer tubes and fan-out tubing
- Have cable management brackets or rings integral to the unit to secure and route cables from the connector modules to the vertical rack members while maintaining a minimum 1.5 inch cable radius

INSTALLATION

Fiber optic cable shall be installed in conduit and cabinets. Fiber optic cable shall be installed in accordance with the manufacturer's installation techniques and procedures. The Contractor shall furnish and install all jumper cables and termination equipment necessary to connect fiber optic cable to the equipment.

The Contractor shall install fiber optic cable as a continuous run, without splices, between the cable ends identified. The Contractor shall label fiber optic cables at each

end of the cable run, at the points where the cable enters and exits the cabinet for mid-cable access locations, and in all junction boxes. Labels for fiber optic cable shall identify the cable number and the string numbers of the fiber contained within the cable.

Installation of fiber optic cable and jumper cables shall meet the minimum requirements of local building codes and NEC Article 770. Cable shall not be pulled along the ground, over or around obstructions, over edges or corners, or through unnecessary curves or bends. Bend radius criteria of 10 times the cable diameter no stress and twenty times cable diameter under stress shall not be exceeded. Manufacturer-approved pulling grips, cable guides, feeders, shoes, and bushings shall be used to prevent damage to cable during installation.

When cable is removed from the reel prior to installation, it shall be placed in a "figure-eight" configuration to prevent kinking or twisting. Care shall be taken to relieve pressure on the cable by placing cardboard shims at each crossover, by creating additional "figure-eights", or by an approved equivalent method.

Prior to the installation of any fiber optic cable in conduit, the Contractor shall provide the cable manufacturer's recommended and maximum pulling tensions to the Engineer. Included with these pulling tensions shall be a list of the cable manufacturer's approved pulling lubricants. Lubricants shall be used in quantities and in accordance with the procedures recommended by the lubricant manufacturer.

Prior to the installation of any fiber optic cable in conduit, all cable pulling equipment shall be approved by the Engineer. The cable pulling equipment shall include a meter to display pulling tension and a mechanism to ensure that the maximum allowable pulling tension cannot be exceeded at any time during installation.

The Contractor shall furnish attachment hardware, installation guides, and other necessary equipment, not specifically listed herein, as required to install the fiber optic cable.

Fiber optic cable in junction boxes shall be properly looped and attached to the sidewall.

Slack fiber optic cable shall be coiled, labeled, and attached to cable guides.

All fibers, including spares, shall be installed from the connector modules, terminated at the appropriate fibers, and secured neatly within the termination rack.

Fiber terminations shall be neatly and permanently labeled on the connector modules to designate transmit or receive.

Blank connector panels shall be of the same finish and manufacture as the connector modules and shall be installed for all unused connector module spaces.

Prior to the installation of jumper cables, the Contractor shall provide and maintain protective covers over the optical connectors and terminations. Protective covers on unused terminations shall remain.

Jumper cables shall be installed from connector modules to end equipment, and from end equipment to end equipment in multiple cabinet configurations. Jumper cables shall be secured to provide strain relief at both the connector module and the end equipment. Manufacturer recommended installation and minimum bend radius requirements shall be adhered to. Jumper cables shall be labeled at both ends.

Any approved splices shall be made using the fusion splice technique and shall not induce more than 0.1 dB attenuation for each splice nor 0.07 dB average for all splices. Splices that exceed 0.1 dB attenuation shall be re-spliced by the Contractor at no additional cost.

TESTING

Fiber optic cables shall be tested by the manufacturer in conformance with the procedures of TIA/EIA-526-7A. Submittal of test data shall include a summary sheet that clearly illustrates measured loss versus budgeted loss. Each test result on the summary sheet shall be identified by cable number(s) and begin and end locations. The Contractor shall identify any unacceptable losses and perform corrective work at no additional cost. The maximum permissible loss for cables other than jumpers, terminations, and connector modules is 0.05 dB. Any cable not compliant shall be replaced in its entirely and re-tested for compliance. A copy of the final, summarized, post-installation test results shall be placed in a protective sleeve approved by the Engineer and attached to the rack or door.

Bi-directional (OTDR) tests shall be conducted by the manufacturer for all string paths. The OTDR tests shall document the loss for each component (connector module, jumper cable, etc.). Short runs of fiber shall be tested using a 'lead-in' cable or an 'attenuator' to obtain proper readings from the OTDR. OTDR traces shall be submitted. Each test shall be clearly annotated with the measured loss identified on the OTDR trace. All tests over 0.05 dB shall be identified on the summary sheet.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Fiber Optic Cable will be measured for payment per unit linear foot. Termination Fiber Rack will be measured for payment per unit each. The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

JUNCTION BOX

DESCRIPTION

Furnish and install Junction Box in accordance with the plans, specifications and Standard Drawings.

MATERIALS

Junction box shall meet or exceed ANSI/SCTE 77-2002, tier 15. Junction box covers shall be marked "Traffic." Covers shall be attached with a minimum of two 3/8“ stainless steel hex bolts.

INSTALLATION

Where required, junction box shall be oriented such that the dimensions comply with the NEC. Junction boxes used as pull boxes along a conduit run shall be spaced at a maximum of 250’. Junction boxes shall not be placed in ditch lines or in areas where standing water may accumulate. Junction box covers shall be flush with the finished surface. The Contractor shall restore all disturbed areas to the satisfaction of the Engineer. This item includes the furnishing and installing of Fastrac bait bag in each junction box for rodent control.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Junction Box will be measured for payment per unit each. The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

TRANSCEIVERS

DESCRIPTION

Furnish single channel video over fiber transceiver and single channel data over fiber transceiver to be located in cabinets and trusses for protection of and/or communications to CCTV camera cabinets, VMS Signs, and high mast pole installations.

MATERIALS

SINGLE CHANNEL DATA OVER FIBER TRANSCEIVER
Single Channel Data over Fiber Transceiver shall be IFS, DE7200-S or approved equal.

All fiber optic transceivers shall be supplied from a single manufacturer.

Fiber optic Ethernet media converters shall be provided. The system shall provide real-time 10/100 Base-T and 100 Base-FX performance. The transceiver shall be used as an Ethernet media converter supporting one Ethernet 100 Base-T electrical port and one Ethernet 100 Base-FX optical port. The transceiver shall have auto MDI/MDI-X operation that has the capability of being forced on. The transceiver shall be fully compatible with all standard IEEE 802.3, 802.3u, and 802.3x Ethernet protocols. The

transceiver shall have an enhanced mode to provide the back-off algorithm changed from IEEE standard 802.3 binary exponential to aggressive mode, enable half-duplex back-pressure, disable excessive collision drop, and enable jumbo frame for streaming media applications. The transceiver requirements shall be two single mode optical fiber. The transceiver shall have a substantially wide dynamic range so as to never require optical or electrical adjustments. Optical attenuators shall never be required. The transceiver shall provide local diagnostic indicators. The transceiver shall support a remote network management option providing full interoperability with industry standard SNMP/IP protocols. All transceivers shall be available in both card mount and surface mount versions. All transceiver shall have automatic, resettable, polymer fuses on all power rails that shall provide for automatic reset, as well as, transient suppression on all data I/O connections. All card mount transceivers shall have an internal DC power supply. A short circuit in one module shall not affect the operation of other modules powered from the common power supply. All card mount transceivers shall have the ability to be inserted into and removed from the communication management chassis without interrupting power and with no risk of damage to other modules or the communications management chassis during replacement. The system shall have an ambient operating temperature of -40°C to +74°C, an ambient storage temperature of -40°C to +85°C, a relative humidity ability of 0% to 95% (non-condensing), have an option for conformal coating, and a MTBF of > 100,000 hours. The transceiver shall meet or exceed NEMA TS-1/TS-2 and Caltrans Traffic Signal Control Equipment Specifications for operating temperature, humidity, mechanical shock, vibration, and voltage transient protection. The transceiver radiated emissions shall be compliant with FCC Part 15, Class B, and EN55022 specifications. The transceiver shall use lasers that are compliant with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations Subchapter J.

SPECIFICATIONS

Data: One (1) channel, bi-directional

DATA SPECIFICATIONS

- Data Protocol: Ethernet
- Operating Mode: Half or full-duplex
- Enhanced or standard IEEE 802.3
- Data Rate: 10/100 Mbps
- Ethernet Compliance: IEEE 802.3, 802.3u, 802.3x
- Ethernet Isolation: 1500 VRMS, One (1) minute

OPTICAL SPECIFICATIONS

- Fiber Type: Single mode
- Wavelength: 1300/1550nm
- Number of Fibers: Two
- Optical Emitter Type: Laser

- Transmitter Output Power: 500µw (-3 dBm)
- Receiver Sensitivity: 5µw (-23 dBm)
- Optical Power Budget: 20 dB

STATUS INDICATOR SPECIFICATIONS

- Power
- Data Rate
- Auto-Negotiate
- Operating Modes
- Optical Link Detect

SINGLE CHANNEL VIDEO OVER FIBER TRANSCEIVER

Single Channel Video over Fiber Transceiver shall be IFS VADT/VADR 14130WDM or approved equal.

All fiber optic modules shall be supplied from a single manufacturer.

Digital fiber optic video and data transmitters and receivers shall be provided as required. The transceiver shall transmit a one-way, single channel of high resolution, true broadcast quality, real-time NTSC or PAL color video. The transceiver shall employ 10-bit digital encoding for transmission of these signals. The transceiver shall meet the RS-250C short-haul standard for video transmission. The transceiver shall provide bi-directional data supporting RS-232, RS-422, or 2 or 4-wire RS-485 data interfaces. The transceiver shall be transparent to all major data protocols (i.e., Manchester Encoding, Bi-Phase, NRZ, NRZI, etc.). The transceiver requirements shall be one single mode optical fiber. The transceiver shall have a substantially wide dynamic range so as to never require optical or electrical adjustments. Optical attenuators shall never be required. The transceiver shall provide local diagnostic indicators. The transceiver shall support a remote network management option providing full interoperability with industry standard SNMP/IP protocols. All transceivers shall be available in both card mount and surface mount versions. All transceivers shall have automatic, resettable, polymer fuses on all power rails that shall provide for automatic reset, as well as, transient suppression on all video and data I/O connections. All card mount transceivers shall have an internal DC power supply. A short circuit in one module shall not affect the operation of other modules powered from the common power supply. All card mount transceivers shall have the ability to be inserted into and removed from the communication management chassis without interrupting power and with no risk of damage to other modules or the communications management chassis during replacement. The transceiver shall have an ambient operating temperature of -40°C to +74°C, an ambient storage temperature of -40°C to +85°C, a relative humidity ability of 0% to 95% (non-condensing), have an option for conformal coating, and a MTBF of > 100,000 hours. The transceiver shall meet or exceed NEMA TS-1/TS-2 Equipment Specifications for operating temperature, humidity, mechanical shock, vibration, and voltage transient protection. The transceiver radiated emissions shall be compliant with FCC Part 15, Class B, and EN55022 specifications. The transceivers shall use lasers that are compliant with FDA

Performance Standard for Laser Products, Title 21, and Code of Federal Regulations Subchapter J.

SPECIFICATIONS

Video: One (1) channel, one-way
Data: One (1) channel, bi-directional, RS-232, RS-422, or 2 or 4-wire RS-485

VIDEO SPECIFICATIONS

- I/O: 1 volt pk-pk (75 ohms)
- Bandwidth: 5Hz – 10 MHz
- Differential Gain: < 2%
- Differential Phase: < 0.7°
- Tilt: < 1%
- Signal-to-Noise Ratio (SNR): 67 dB @ maximum optical loss budget

DATA SPECIFICATIONS

- Data Interface: RS-232, RS-422, or 2 or 4-wire RS-485
- Data Format: NRZ, NRZI, Manchester, Bi-Phase
- Data Rate: DC – 230 kbps (NRZ)
- Bit Error Rate (BER): < 1 x 10-9 @ maximum optical loss budget
- Operating Mode: Simplex or full-duplex

OPTICAL SPECIFICATIONS

- Fiber Type: Single Mode
- Wavelength: 1300/1550nm
- Number of Fibers: One
- Optical Emitter Type: Laser
- Transmitter Output Power: 600µw (-2 dBm)
- Receiver Sensitivity: 3µw (-25 dBm)
- Optical Power Budget: 23 dB

STATUS INDICATOR SPECIFICATIONS

- Power
- Video Sync
- Data Receive
- Data Transmit
- Optical Link Detect

This item includes cables, connectors, power supplies, and all incidentals required for operation.

INSTALLATION

The Contractor shall single channel data over fiber transceivers and single channel video over fiber transceivers in Model 334/336 enclosures, VMS signs, on poles, and on sign trusses as specified on layout sheets. The Contractor shall be responsible for the transceivers working properly with other equipment.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Single Channel Data over Fiber Transceiver will be measured for payment per unit each. The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

TRENCHING AND BACKFILLING

DESCRIPTION

Trenching and Backfilling shall be performed in accordance with the plans, specifications and Standard Drawings.

MATERIALS

All trenches shall be marked with underground utility warning tape.

INSTALLATION

The Contractor shall be responsible for locating all underground utilities prior to excavation. The Contractor shall excavate the trench, place warning tape above the conduit, backfill the trench and restore all disturbed areas to the satisfaction of the Engineer. Backfill material shall be placed and compacted in lifts of 9 inches or less.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Trenching and Backfilling will be measured for payment per unit linear foot. The Department will make payment for complete, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

BORE AND JACK

DESCRIPTION

Bore and Jack shall be performed in accordance with the plans, specifications and Standard Drawings.

MATERIALS

Bore and Jack does not include furnishing and installing conduit.

INSTALLATION

The Contractor shall be responsible for boring a hole for installing conduit under the existing roadway in accordance with the construction method described in the first, second, and fourth paragraphs of Section 706.03 of the Standard Specifications.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Bore and Jack will be measured for payment per unit linear foot. The Department will make payment for complete, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

WEB CAMERA ASSEMBLY

DESCRIPTION

Furnish and install Web Camera Assembly in accordance with the plans, specifications and Standard Drawings.

MATERIALS

The Web Camera Assembly shall be an Axis Network Dome Model Q6032-E or approved equivalent. This item shall include the color camera, zoom lenses, environmental enclosure, pan/tilt unit, housing, dome, parapet mount, and all mounting hardware, power cable, connections, and incidentals necessary to complete the work.

Proposed alternates shall be commercially available. The Contractor shall identify an installed site where the proposed alternate Web Camera Assembly has been operating for a period of at least one year in a similar climate region.

The Web Camera Assembly shall include the following:

Outdoor pendant dome:

- Acrylic (PMMA) clear dome cover
- Sunshield (PC/ACA)
- IP66 Rated
- Operating temperature: -40 degrees F to 122 degrees F
- Unit weight: 7.7 lbs

Mounting Hardware:

- Pole mount adapter with banding straps and clips
- Pendant adapter

Web camera

- Image Sensor: ¼" Sony EXview HAD progressive scan CCD
- Lens: F1.4-4.2, f=3.4 mm wide to 119 mm tele, autofocus with 35x optical zoom and 12x digital zoom, total 420x zoom
- Lens horizontal viewing angle: 55.8 degrees (wide end) to 1.7 degrees (tele end)
- Minimum illumination: Color: 0.5 lux at 30 IRE F1.4, B/W: 0.008 lux at 30 IRE F1.4

- Automatic day and night functionality
- Video compression: H.264 (MPEG-4 Part 10/AVC) Motion JPEG
- Resolution: D1 720x480 to 176x120
- Frame rate: H.264: Up to 30fps, Motion JPEG: Up to 30 fps
- Video streaming: Multiple, individually configurable streams in H.264 and Motion JPEG; Controllable frame rate and bandwidth; VBR/CBR H.264
- Image settings: Wide dynamic range (WDR), electronic image stabilization (EIS), manual shutter time, compression, color, brightness, sharpness, white balance, exposure control, exposure zones, backlight compensation, fine tuning of behavior at low light, rotation, aspect ratio correction, text and image overlay, privacy mask, image freeze on PTZ.
- Pan: 360 degrees endless, max speed 450 degrees/s
- Tilt: 220 degrees, max speed 450 degrees/s
- Zoom: 35X optical, 12x digital
- 100 preset
- Guard tour
- Control Queue
- Shutter speed: 1/30000 s to 0.5 s
- IR illumination
- Security: Multi-level password protection, IP address filtering, HTTPS encryption, IEEE 802.1X network access control, digest authentication, user access log
- Event management: Events triggered by built-in motion detection, external inputs, auto-tracking or according to a schedule; Image upload over FTP, email and HTTP; Notification over TCP, email, HTTP and external outputs
- RJ-45 for 10BASE-T/100BASE-TX PoE
- Video processing and compression: ARTPEC-3, 128 MB, 128 MB Flash
- High power over Ethernet (high PoE) IEEE 802.3at, max 60 W; High PoE Midspan 1-port: 100 – 240 V AC, max 74 W
- Local storage: SD/SDHC memory card slot
- Operating temperature: -40 degrees F to 122 degrees F
- Video access from Web brower: Camera live view, video recording to file (ASF), sequence tour of up to 20 cameras, Customizable HTML pages, and complete remote control pan, tilt, and zoom
- Supported protocols: IPv4/v6, HTTP, HTTPS, SSL/TLS, QoS Layer 3 DiffServ, FTP, SMTP, Bonjour, UPnP, SNMPv1/v2c/v3 (MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DCP, ARP, SOCKS
- EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 55024 approvals
- FCC Part 15 Subpart B Class B, ICES-003 Class B, VCCI Class B, C-tick AS/NZS CISPR 22, ICES-003, KCC Class B, EN 60950-1 Approvals
- IEC 60529 IP66, NEMA 250 Type 4X, IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-78, IEC 60068-2-14, IEC 60068-2-30, IEC 60068-2-6, IEC 60068-2-27, IEC 60068-2-60, ISO 4892-2 Approvals
- EN 60950-1, GS, UL, cUL, CE, FCC, VCCI, CB, KCC, UL-AR Midspan Approvals

INSTALLATION

Web Camera Assembly shall be installed on a wood pole or steel strain pole as specified in the plans and in accordance with the manufacturer's instructions. Installation shall comply with all warranty provisions and warranty contract maintenance services. Installation shall comply with all local, state, and federal building, electrical and construction codes, and Motorola R-56 requirements. All wiring access to the Web Camera Assembly shall be through watertight fittings. Wiring access points shall be on the side or underneath components; no exposed top access is permitted. The Web Camera Assembly shall be installed so that the assembly is located on the side of the pole closest to the roadway when the camera is in its fixed position at the top of the pole. The contractor is responsible to verified all functions of the web camera through a laptop interface.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Web Camera Assembly will be measured for payment per unit each. The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

SURGE DEVICES

DESCRIPTION

Furnish and install video surge device, data surge device, power surge device, and RF surge device in accordance with the plans, specifications and Standard Drawings.

MATERIALS

GENERAL

Each surge device shall be compatible with the equipment it is protecting. Each surge device shall include cables, connectors, power supplies, and all incidentals required for operation.

VIDEO SIGNAL COAX CONDUCTOR SURGE DEVICE

Video Signal Coax Conductor Surge Device shall be EDCO CX12-BNC-Y or approved equal. This surge protector shall:

- Have a clamping voltage response time of less than one nanosecond
- Have a maximum clamping voltage of 12 volts when subjected to a 3 kA, 8x20 microsecond wave
- Have a peak surge current of 20kA with 8x20 microsecond wave
- Have BNC connectors
- Pass signals from DC to 80 MHz with less than 3 dB insertion losses
- Be UL 497B listed

DATA SIGNAL CONDUCTOR SURGE DEVICE

Data Signal Conductor Surge Device shall be for RS 422 and RS 485 Communication conductors shall be EDCO PC642C-015 or approved equal. This surge protector shall:

- Have a clamping voltage response time of less than one nanosecond
- Have a maximum clamping voltage of 12 volts when subjected to a 1 kA 8x20 microsecond wave
- Have a peak surge current per wire of 10 kA with 8x20 microsecond wave
- Have a maximum inline resistance of 6 ohms
- Have a maximum attenuation of -3db at 50MHz

RS 232 COMMUNICATION DATA SIGNAL CONDUCTOR SURGE DEVICE

Data Signal Conductor Surge Device for RS 232 Communication conductors shall be EDCO PC642C-015 or approved equal. This surge protector shall:

- Have a clamping voltage response time of less than one nanosecond
- Have a maximum clamping voltage of 30 volts when subjected to a 1 kA 8x20 microsecond wave
- Have a peak surge current per wire of 3kA with 8x20 microsecond wave
- Have a maximum inline resistance of 6 ohms
- Have a maximum attenuation of -3 db at 0.5 MHz

100 BASE-T AND 10 BASE-T COMMUNICATION DATA SIGNAL CONDUCTOR SURGE DEVICE

Data Signal Conductor Surge Device for 100BaseT and 10BaseT Communication conductors shall be EDCO LCDP-30 or approved equal. This surge protector shall:

- Have a clamping voltage response time of less than one nanosecond
- Have a maximum clamping voltage of 30 volts when subjected to a 0.5 kA 8x20 microsecond wave
- Have a peak surge current per wire shall be 1kA with 8x20 microsecond wave
- Have a maximum attenuation shall be -3db at 100 MHz
- Have a N.E.X.T. worst pair of better than -40 db at 100 MHz
- Have a maximum attenuation of -3db at 0.5 MHz

POWER CONDUCTOR SURGE DEVICE

Conductor Surge Device for power carrying conductors shall be EDCO SHA-1210 or approved equal. This surge protector shall meet or exceed the following specifications:

- Nominal Line Voltage 120 V
- Peak Current 20,000 Amps
- Clamp Voltage 280 volt typical @ 20kA
- Response time <5ns
- Continuous Service Current 10 Amps max. 120 VAC, 60 Hz

RF ANTENNA COAX CONDUCTOR SURGE DEVICE

RF Antenna Coax Conductor Surge Devices shall meet all manufacturer recommendations for the particular use of the radio antenna coax conductors.

INSTALLATION

The Contractor shall supply surge devices in model 334/336 enclosures, VMS signs, on poles, and on sign trusses as specified on layout sheets. Surge devices shall be located in said equipment such that they are easily accessible for maintenance activities.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Surge Device will be measured for payment per unit each. The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

ADAPTIVE TRAFFIC SIGNAL

DESCRIPTION

The Adaptive Traffic Signal shall consist of furnishing, configuring and placing into operation an adaptive traffic signal control system that detects and collects vehicle data and automatically optimizes the changing of traffic signals to instantly adapt to real-time traffic demands.

The proposed project corridor is along KY 1747, Hurstbourne Parkway, from the intersection of Bluegrass Parkway (MP 11.680) to Linn Station Road (MP 12.290). This section includes the on and off ramps for I-64. Average Daily Traffic on this section of KY 1747 ranges from 60,000 vpd near Linn Station up to 76,000 vpd south of I-64. Due to the high traffic volumes, traffic congestion is a common occurrence on the roadway. The section includes seven (5) signalized intersections. These intersections are listed below:

- Hurstbourne Parkway and Linn Station Road KY 1747 MP 12.290
- Hurstbourne Parkway and Caritas Way MP 12.160
- Hurstbourne Parkway and I-64 WB Ramps MP 12.000
- Hurstbourne Parkway and I-64 EB Ramps MP 11.830
- Hurstbourne Parkway and Bluegrass Parkway MP 11.680

System shall include the components, adaptive operations, software, installation training, technical support and warranty described herein. System supplier must be able to provide ample evidence, both of a quantitative and qualitative nature, of the adaptive system's successful performance in multiple locations and public transportation agencies' positive experience with supplier.

The system provider shall also employ a third party agency/consultant to perform "before and after" evaluations and simulation of the operational and performance of the deployed system to support future deployments of the technology along other congested

corridors. The third party agency/consultant shall be prequalified by KYTC in "Traffic Engineering".

The initial evaluation should include micro-simulation (VISSIM) of the selected system. This micro-simulation should utilize a "hardware-in-the-loop" or similar system. It is envisioned that this evaluation would be performed in conjunction with the system deployment in the field. LJCMG will provide recent Synchro /SimTraffic 7 files for the corridor to provide baseline data for the mirco-simulation effort. The evaluation should also include before and after studies (i.e. intersection delays and corridor travel times consistent with KYTC requirements). The before and after evaluations shall include GPS travel time data collection and analysis for five separate time periods: weekday morning peak, weekday midday peak, weekday evening peak, and two weekend time periods. KYTC requires a minimum of seven high-quality travel time runs per direction per time period for analysis purposes. This evaluation will assist in in-service adjustments to optimize potential benefits as well as document the benefits of the adaptive system to assist in decision making of future deployments. The results of the micro-simulation and the before and after studies shall be provided through a detailed final report. The electronic micro-simulation files and the GPS travel time files shall be submitted to LJCMG.

The purpose of the system provider qualifications section is to determine the ability of the system provider to successfully furnish, configure and place into operation an adaptive traffic signal control system. System providers must describe and offer evidence of their ability to meet the project objectives. Specifically, the following information should be provided:

1. Provide a brief narrative describing the history of the firm that will provide and install the proposed system. Required information includes the firm's origins, purpose, ownership, organizational structure, and growth. If the company has ever filed for bankruptcy or been in loan default, or if there are any pending liens, claims, or lawsuits against the firm, provide a description here.

2. Describe the system provider capabilities and experience in the implementation of multiple arterial-based adaptive traffic control systems. Provide a description of at least 3 projects for municipal agencies in the United States where your firm successfully deployed the proposed adaptive systems with traffic characteristics similar to the proposed test site and describe the role that your firm played in each project. For each related project, provide the following information:

    - Name of project
    - Name of client (organization name)
    - Point of contact (i.e., reference) for client, with contact information

- Beginning and ending dates of the project
- Description of project and work

3. Provide letters of reference from selected clients to document the following:

    - Overall quality of performance and level of client satisfaction
    - Your firm's capabilities and skills
    - Depth of experience directly related to the successful deployment and continued support of adaptive traffic control systems.
    - Ability to perform within schedule and deliver on-time
    - Ability to perform within available budget and deliver high value for funds invested
    - Positive working relationship with clients and other team members.

Bidders must specifically address all criteria in their response. Any deviations or exceptions to the specifications or requirements must be described with the bid. Failure to list such exceptions or deviations in the bid may be considered sufficient reason to reject the bid.

The relative importance of the criteria is defined below:

Primary Criteria

- System Providers Qualifications
- Services Defined
- Evidence of Successful Performance and Implementation

MATERIALS

The proposed Computerized Adaptive Traffic Signal Control System software and hardware (specific hardware and software included in the bid) shall be already developed, working, and fully operational at a minimum of three municipal locations in the United States and requiring minimal modifications except specific customization for installation and operation in Louisville, Kentucky. Software architecture shall be "industry accepted," expandable and must work in an Ethernet Local Area Network environment. This project includes the installation of wireless in-pavement detections in all lanes (at stop bars) for each traffic signal that the proposed system will be installed.

The following is a list of primary functional requirements that the System Software is required to meet:

- Control and monitoring of Type 170 controllers (using Wapiti W4IKS firmware version 36) for (5) existing traffic signals on one arterial (KY 1747).
- Provide, install and integrate appropriate hardware, software or processing units for the purpose of collecting pedestrian actuation data and provide functionality to minimize delays for servicing pedestrian calls.
- The system shall be compatible with the existing local controller hardware/firmware and the KYTC's TransPHAT system along with Louisville Jefferson County Metro Government's Advanced Traffic Management System (CENTRACS). The reconstructed traffic signals will continue to operate with TransPHAT and it is envisioned that this group of signals will eventually be under CENTRACS control and monitoring.
- Collect and analyze intersection traffic data (volumes, occupancy, degree of saturation etc.) in real time.
- Use real time traffic data to create new timing patterns dynamically in accordance with traffic variations in real time and automatically implement the timing patterns. The timing patterns shall optimize the traffic flow on the arterial(s) for each traffic pattern. The optimization may include dynamic changes in cycle length, offsets, splits, phasing or any other parameters that achieve the same effect.
- The system shall detect and provide alarms when elements of the adaptive system malfunction. It is desirable that the alarms shall provide English descriptions of the malfunctions, as opposed to coded information.
- The system shall provide the capability to backup and store critical configuration data and traffic data for future use and reporting. The system shall maintain a minimum of three months of data prior to overwriting.
- The system shall provide the capability to provide user-friendly reports on configuration information, daily operation and collected data.
- The system shall provide remote access via a personal computer (PC) or laptop computer with the appropriate software and user credentials.
- The system shall provide capability for the operator to establish a manual override function for signal changes or to revert to programmed time-of-day and day-of-week schedules programmed in the local controller.
- The system shall provide security and access hierarchy provisions with a minimum of three levels of access (Administrator, Manager/Supervisor, and Operator).
- The system should have the ability to run a fixed time of day pattern if necessary.
- The system should provide graphic video displays of intersection/arterial system operations.
- The system shall provide the capability for uploading and downloading from a PC or laptop computer.
- The system and each signal installation should provide a watchdog circuit to reset the system in the event of a malfunction. The system shall also provide a recovery function in case of power failure or power anomalies.

The selected system shall incorporate the capability to include pedestrian calls in the optimization algorithms, shall keep accurate time using a mechanism that synchronizes

the clocks at least weekly and shall be capable of functioning in a detector mode or adaptive mode selectable by time of day and day of week.

The system provider shall provide, identify and install all necessary hardware and software that is required for a fully operational system that provides for all of the functionality as described above. This includes all communication hardware. A new single mode fiber network for communications between each of the five traffic signals will be installed through the roadway widening project.
The proposed system and full complement of equipment shall be compliant with applicable IEEE and NEMA standards. The equipment shall meet the NEMA environmental, power, surge and other ratings according to the latest NEMA specifications. Watchdog circuits and automated recovery from power failure or power irregularities shall be provided as part of the system. Bidders must provide a list of all equipment and any incidental items necessary for the proper operation of the system according to the proposed design.

Cabling and devices provided through this contract shall be suitable for the environment in which they are placed and designed for multiple repetitions of connection and disconnection. Equipment and material shall be of new stock unless the contract expressly provides for relocation of existing units or use of units furnished by others. New equipment and material shall be the product of established manufacturers, conform to applicable requirements of CALTRANS 170 Specifications, ICEA, IMSA, ITE, MUTCD, NEMA, RETMA, NEX and applicable regulations of the National Board of Fire Underwriters and National Board of Electrical Underwriters. Product cut sheets or appropriate documentation shall be provided for review and approval by LFUCG and KTC prior to installation.

Bidders shall submit proposed software license and maintenance agreements within their proposals. KYTC will ultimately review and provide approvals for all licenses and agreements. All licenses and agreements shall be conveyed to and through the KYTC. Licenses shall be able to be used on any state owned signal regardless of the maintaining agency.

System will be warranted for 2 years on all hardware and 3 years for software updates, troubleshooting, and functionality from date of installation. System must provide software corrections and any needed updates to the base system. Ongoing Maintenance Agreements must be available from Adaptive Traffic Control System provider.

INSTALLATION

The selected system provider shall provide qualified representatives to be on-site for the deployment of the complete system. It is envisioned that the adaptive system will be deployed 4 weeks after the roadway and traffic signal construction is completed and the signals are running time-of-day and day-of-week coordinated traffic signal plans per

existing operations. All the detection shall also be operational, tested and deemed acceptable prior to the deployment of the adaptive system. System provider shall perform field optimization immediately following deployment.

The proposed on-site communications network must be established prior to installation of the adaptive system using the single mode fiber network that will be installed between signals through the roadway project. This network must be able to provide Ethernet connectivity over fiber for all intersections identified to receive an adaptive traffic control system. Media Converters (Fiber) must be completely networked to allow adaptive system to operate properly. Media convertors (transceivers) will be provided for the fiber system by KYTC but if there are not enough media convertors initially supplied, the contractor shall provide additional media convertors and they will be incidental to this item.

Bidders should provide an explanation of their proposed plan for the successful deployment and integration of the adaptive traffic management system. This plan should include provisions for providing software and integration services for the micro-simulation evaluation that is envisioned prior to actual field deployment. The proposal should provide a typical step-by-step plan for implementation of your proposed system and describe any past implementation issues and how they were resolved. The KYTC will require that the successful bidder completely deploy the specified solution within 4 weeks of the completion of the traffic signal reconstruction. The required communications network will be installed as part of the project and must be fully operational prior to the deployment of the system.

Other hardware to be provided by the vendor includes any and all local and system detection hardware and software necessary for the proper operation of adaptive control. All hardware and software that is to be supplied by the vendor shall be clearly identified. It is envisioned that the system provider shall provide all equipment as necessary to access an existing local area network (LAN) of PCs located at the LJCMG Traffic Control Center at 601 West Jefferson Street. Laptop computers and PCs are not a part of this contract and will be provided by LJCMG. The vendor shall install any required software on at least one laptop (LJCMG) and two PC (LJCMG and KYTC), in addition to providing assistance as necessary for loading software onto additional laptops or PCs. This assistance for loading the software will be only during the initial 3 year period that is require for the software upgrades and initial installation of the software on any licensed computer. Software licenses shall be provided as a part of this contract, at no additional cost for a minimum of 20 PCs or laptops.

The Final Acceptance Test will begin upon completion of all software and hardware installations and demonstration of all system functions. The test should be comprised of forty five (45) calendar days of live operation and the start of the Final Acceptance Test shall be scheduled by the LJCMG based on location and during periods of significant traffic demand as determined by LJCMG and KYTC.

The system software should be available and operational for at least 90% of the day during

this period to constitute a valid test.

TRAINING

System providers shall be responsible for providing a comprehensive training plan that outlines the agenda and information to be presented to LJCMG and KYTC staff. The training sessions will be conducted at LJCMG facilities. Initial training shall be provided in advance of system deployment, and additional training shall be conducted following deployment of the system.

Training shall cover, at a minimum, system capabilities and limitations, required initial and ongoing inputs, field system configuration, updating the system to optimize performance, and how to operate and troubleshoot the system.

Training shall be tailored to staff receiving the training. LJCMG and KYTC staff to receive training shall include Engineering, and Maintenance staff. Total number of personnel to receive training is approximately (10).

Consultant shall submit the training plan to LJCMG and KYTC for approval prior to implementation.

DOCUMENTATION

The system provider should provide system documentation, at a minimum, on software/firmware operation (including troubleshooting), system configuration, and all other technical and reference information related to the system and its operation and maintenance.

System configuration documentation shall include records of detector mapping diagrams, communication network diagrams, and all other work and modifications related to the installation of the system.

System providers shall submit a recommended operation policy and the requirements for maintenance.

Consultant shall provide five hard (5) copies and one (1) electronic copy of all documentation.

Deliverables:
- System Configuration Documents
- Operation/Maintenance Manuals
- Troubleshooting Guide
- Recommended Operating Policy
- Before and After Evaluation Report
- Electronic Files of GPS Travel Time Runs

Electronic Files on Micro-Simulation

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Adaptive Traffic Signal will be measured for payment per unit of each signal that will have the system installed. The Department will make payment for complete, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

GLOSSARY

The following acronyms, abbreviations, and definitions shall govern this specification:

- AASHTO – American Association of State Highway and Transportation Officials
- ABS - Acrylonitrile Butadiene Styrene
- AC – Alternating Current
- AlInGaP – Aluminum Indium Gallium Phosphide (refers to the chemical composition of an LED).
- ANSI – American National Standards Institute
- ASCII – American Standard Code for Information Interchange
- ASN.1 – Abstract Syntax Notation 1
- ASTM – American Society for Testing and Materials
- AWG - American Wire Gauge
- AWS – American Welding Society
- BCD – Binary Coded Decimal
- B frames – Bi-directional Predicted Frames
- BGP – Border Gateway Protocol
- Bin – Group of LEDs categorized and sorted by intensity or color. Each bin has upper and lower intensity or color specifications and contains only LEDs that are measured to be within that range. LED manufacturers sort LEDs into bins to ensure consistent intensity and color properties.
- BOOTP – Bootstrap Protocol
- CALTRANS – California Department of Transportation
- CAN – Control Area Network
- CCTV – Closed Circuit Television
- CDPD – Cellular Digital Packet Data
- CLI – Command Line Interface
- CNC – Computer Network Control
- Control Computer – A desktop or laptop computer used in conjunction with VMS control software to communicate with VMS sign controllers. The control computer can instruct a VMS sign controller to program and control the VMS, monitor VMS status, and run VMS diagnostic tests. A control computer can be used for remote control of one of more VMS, as well as for local control of a single VMS
- DC – Direct Current
- DHCP – Dynamic Host Configuration Protocol
- DMS – Dynamic Message Sign. An industry term that applies to various types of

changeable sign technology

- DVI-D – Digital Visual Interface - Digital
- EIA – Electronic Industries Association
- ELFEXT – Equal Level Far End Crosstalk
- EPA – Effective Projected Area
- FCC – Federal Communications Commission
- FDA – Food and Drug Administration
- Font – The style and shape of alphanumeric characters that are displayed on the VMS matrix to create messages viewed by motorists and travelers
- Frame – see *Page*
- FSORS – Full, Standardized Object Range Support – an NTCIP term. See the NTCIP standards for additional information.
- GUI – Graphical User Interface
- HDPE – High Density Polyethylene
- HHR – Half Horizontal Resolution
- HTTP – Hypertext Transfer Protocol
- IEEE – Institute of Electrical and Electronic Engineers
- I frames – Intra-frames
- IC – Integrated Circuit
- IGMP
- InGaAlP – Indium Gallium Aluminum Phosphide
- I/O – Input/Output
- IP – Internet Protocol – in transceivers
- IRE – Institute of Radio Engineers
- ISO – International Organization for Standardization
- ITE – Institute of Transportation Engineers
- ITS – Intelligent Transportation System
- Kbps – Kilobits per second
- KYTC – Kentucky Transportation Cabinet
- LAN – Local Area Network
- LCD – Liquid Crystal Display
- LED – Light Emitting Diode
- MDPE – Medium Density Polyethylene
- Message – Information displayed on the VMS for the purpose of visually communicating with motorists. A VMS message can consist of one or more pages of data that are displayed consecutively
- MIB – Management Information Base
- Module – Assembly consisting of a two-dimensional LED pixel array, pixel drive circuitry, and mounting hardware. Modules are installed in the display adjacent to each other to form the display matrix.
- MTBF – Mean Time Between Failures
- MPEG – Moving Picture Experts Group
- NEC – National Electrical Code

- NEMA – National Electrical Manufacturers Association
- NESC – National Electrical Safety Code
- NEXT – Near End Crosstalk
- NCHRP – National Cooperative Highway Research Program
- NRZ – Non Return to Zero
- NRZI – Non Return to Zero Inverted
- NTCIP – National Transportation Communications for ITS Protocol
- NTSC - National Transmission Standards Committee
- Object – An NTCIP term referring to an element of data in an NTCIP-compatible device that can be manipulated to control or monitor the device.
- OER – Octet Encoding Rules
- OSHA – Occupational Safety and Health Administration
- OTDR – Optical Time Domain Reflectometer
- Page – An NTCIP term referring to the data that is displayed on the VMS display matrix at a given moment in time. Also referred to as a frame.
- P frames – Forward Predicted Frames
- PCB – Printed Circuit Board
- Pixel – Picture element. The smallest changeable (programmable) portion of a VMS display matrix
- PMPP – Point to Multi-Point Protocol
- PPP – Point to Point Protocol
- PSELFEXT – Power Sum Equal Level Far End Cross Talk
- PSNEXT – Power Sum Near End Crosstalk
- PTZ – Pan/Tilt/Zoom
- PVC – Polyvinyl Chloride
- PWM – Pulse Width Modulation
- QSIF – Quarter Source Input Format
- RAM – Random Access Memory
- RARP – Reverse Address Resolution Protocol
- RGB – Red-Green-Blue
- Schedule – A set of data that determines the time and date when a VMS sign controller will cause a stored message to be displayed on the VMS
- SDRAM – Synchronous Dynamic Random Access Memory
- SIF – Source Input Format
- SNMP – Simple Network Management Protocol
- STMP – Simple Transportation Management Framework
- Stroke – Refers to the vertical and horizontal width of the lines and curves of a display font. Single stroke denotes character segments that are one pixel wide. Double stroke denotes character segments that are two pixels wide.
- TFTP – Trivial File Transfer Protocol
- TIA - Telecommunications Industry Association
- TMA – Truck Mounted Attenuator
- TOC – Traffic Operations Center

- UL – Underwriters Laboratories
- UPS – Uninterruptible Power Supply
- USB – Universal Serial Bus
- VLAN – Virtual Local Area Network
- VMS – Variable Message Sign. A type of VMS that is fully programmable such that the content of its messages are fully changeable remotely and electronically.
- VMS Controller – A stand-alone computer that is located at a VMS site, which controls a single VMS. A sign controller receives commands from and sends information to a control computer
- WAN – Wide Area Network
- WYSIWYG – What You See Is What You Get. More specifically, what you see on the VMS control computer monitor is a scaled representation of how a message will appear when it is being displayed on the VMS. Similarly, after a pixel diagnostic test routine has been run, what you see on the control computer monitor is a scaled representation of the functional status of each pixel in the VMS display matrix.

Kentucky Transportation Cabinet

Highway District 5

And

_____(2), Construction

Kentucky Pollutant Discharge Elimination System Permit KYR10 Best Management Practices (BMP) plan

Groundwater protection plan

For Highway Construction Activities

For

I-64 & Hurstbourne Parkway Interchange

Project: PCN ## -

Project information

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

1. Owner – Kentucky Transportation Cabinet, District 5

2. Resident Engineer: (2)

3. Contractor name: (2)
   Address: (2)

   Phone number: (2)
   Contact: (2)
   Contractors agent responsible for compliance with the KPDES permit requirements (3):

4. Project Control Number (2)

5. Route (Hurstbourne Parkway – Kentucky Route 1747)

6. Latitude/Longitude (38°13’25” North, 85°34’44” West)

7. County (Jefferson)

8. Project start date (date work will begin): (2)

9. Projected completion date: (2)

A. Site description:

1. Nature of Construction Activity (Hurstbourne Parkway and Ramp Improvements at I-64 and Hurstbourne Parkway Interchange)

2. Order of major soil disturbing activities (2) and (3)

3. Projected volume of material to be moved (5039 cubic yards excavation, 6,755 cubic yards embankment)

4. Estimate of total project area (8 acres)

5. Estimate of area to be disturbed (8 acres)

6. Post construction runoff coefficient will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information.

7. Data describing existing soil condition (1) & (2)

8. Data describing existing discharge water quality (if any) (1) & (2)

9. Receiving water name (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)

B. Sediment and Erosion Control Measures:

1. Plans for highway construction projects will include erosion control sheets that depict Disturbed Drainage Areas (DDAs) and related information. These plan sheets will show the existing project conditions with areas delineated by DDA within the right of way limits, the discharge points and the areas that drain to each discharge point. Project managers and designers will analyze the DDAs and identify Best Management Practices (BMPs) that are site specific. The balance of the BMPs for the project will be listed in the bid documents for selection and use by the contractor on the project with approval by the resident engineer.

   Projects that do not have DDAs annotated on the erosion control sheets will employ the same concepts for development and managing BMP plans.

2. Following award of the contract, the contractor and resident engineer will annotate the erosion control sheets showing location and type of BMPs for each of the DDAs that will be disturbed at the outset of the project. This annotation will be accompanied by an order of work that reflects the order or sequence of major soil moving activities. The remaining DDAs are to be designated as “Do Not Disturb” until the contractor and resident engineer prepare the plan for BMPs to be employed. The initial BMP’s shall be for the first phase (generally Clearing and Grubbing) and shall be modified as needed as the project changes phases. The BMP Plan will be modified to reflect disturbance in additional DDA’s as the work progresses. <u>All DDA’s will have adequate BMP’s in place before being disturbed.</u>

3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:

   - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
   - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be

inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.

- Clearing and Grubbing – The following BMP's will be considered and used where appropriate.
  - Leaving areas undisturbed when possible.
  - Silt basins to provide silt volume for large areas.
  - Silt Traps Type A for small areas.
  - Silt Traps Type C in front of existing and drop inlets which are to be saved
  - Diversion ditches to catch sheet runoff and carry it to basins or traps or to divert it around areas to be disturbed.
  - Brush and/or other barriers to slow and/or divert runoff.
  - Silt fences to catch sheet runoff on short slopes. For longer slopes, multiple rows of silt fence may be considered.
  - Temporary Mulch for areas which are not feasible for the fore mentioned types of protections.
  - Non-standard or innovative methods.
- Cut & Fill and placement of drainage structures - The BMP Plan will be modified to show additional BMP's such as:
  - Silt Traps Type B in ditches and/or drainways as they are completed
  - Silt Traps Type C in front of pipes after they are placed
  - Channel Lining
  - Erosion Control Blanket
  - Temporary mulch and/or seeding for areas where construction activities will be ceased for 21 days or more.
  - Non-standard or innovative methods
- Profile and X-Section in place – The BMP Plan will be modified to show elimination of BMP's which had to be removed and the addition of new BMP's as the roadway was shaped. Probably changes include:
  - Silt Trap Type A, Brush and/or other barriers, Temporary Mulch, and any other BMP which had to be removed for final grading to take place.
  - Additional Silt Traps Type B and Type C to be placed as final drainage patterns are put in place.
  - Additional Channel Lining and/or Erosion Control Blanket.
  - Temporary Mulch for areas where Permanent Seeding and Protection cannot be done within 21 days.
  - Special BMP's such as Karst Policy
- Finish Work (Paving, Seeding, Protect, etc.) – A final BMP Plan will result from modifications during this phase of construction. Probably changes include:
  - Removal of Silt Traps Type B from ditches and drainways if they are protected with other BMP's which are sufficient to

control erosion, i.e. Erosion Control Blanket or Permanent Seeding and Protection on moderate grades.

- Permanent Seeding and Protection
- Placing Sod
- Planting trees and/or shrubs where they are included in the project

➢ BMP's including Storm Water Management Devices such as velocity dissipation devices and Karst policy BMP's to be installed during construction to control the pollutants in storm water discharges that will occur after construction has been completed are : (1)

C. Other Control Measures

1. No solid materials, including building materials, shall be discharged to waters of the commonwealth, except as authorized by a Section 404 permit.

2. Waste Materials

All waste materials that may leach pollutants (paint and paint containers, caulk tubes, oil/grease containers, liquids of any kind, soluble materials, etc.) will be collected and stored in appropriate covered waste containers. Waste containers shall be removed from the project site on a sufficiently frequent basis as to not allow wastes to become a source of pollution. All personnel will be instructed regarding the correct procedure for waste disposal. Wastes will be disposed in accordance with appropriate regulations. Notices stating these practices will be posted in the office.

3. Hazardous Waste

All hazardous waste materials will be managed and disposed of in the manner specified by local or state regulation. The contractor shall notify the Resident Engineer if there any hazardous wastes being generated at the project site and how these wastes are being managed. Site personnel will be instructed with regard to proper storage and handling of hazardous wastes when required. The Transportation Cabinet will file for generator, registration when appropriate, with the Division of Waste Management and advise the contractor regarding waste management requirements.

4. Spill Prevention

The following material management practices will be used to reduce the risk of spills or other exposure of materials and substances to the weather and/or runoff.

➢ **Good Housekeeping:**

The following good housekeeping practices will be followed onsite during the construction project.

- An effort will be made to store only enough product required to do the job
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure
- Products will be kept in their original containers with the original manufacturer's label
- Substances will not be mixed with one another unless recommended by the manufacturer
- Whenever possible, all of the product will be used up before disposing of the container
- Manufacturers' recommendations for proper use and disposal will be followed
- The site contractor will inspect daily to ensure proper use and disposal of materials onsite

➢ **Hazardous Products:**

These practices will be used to reduce the risks associated with any and all hazardous materials.

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data sheets (MSDS) will be reviewed and retained
- Contractor will follow procedures recommended by the manufacturer when handling hazardous materials
- If surplus product must be disposed of, manufacturers' or state/local recommended methods for proper disposal will be followed

The following product-specific practices will be followed onsite:

➢ **Petroleum Products:**

Vehicles and equipment that are fueled and maintained on site will be monitored for leaks, and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum

products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.

This project (will / will not) (3) have over 1,320 gallons of petroleum products with a total capacity, sum of all containers 55 gallon capacity and larger.

- **Fertilizers:**

Fertilizers will be applied at rates prescribed by the contract, standard specifications or as directed by the resident engineer. Once applied, fertilizer will be covered with mulch or blankets or worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

- **Paints:**

All containers will be tightly sealed and stored indoors or under roof when not being used. Excess paint or paint wash water will not be discharged to the drainage or storm sewer system but will be properly disposed of according to manufacturers' instructions or state and local regulations.

- **Concrete Truck Washout:**

Concrete truck mixers and chutes will not be washed on pavement, near storm drain inlets, or within 75 feet of any ditch, stream, wetland, lake, or sinkhole. Where possible, excess concrete and wash water will be discharged to areas prepared for pouring new concrete, flat areas to be paved that are away from ditches or drainage system features, or other locations that will not drain off site. Where this approach is not possible, a shallow earthen wash basin will be excavated away from ditches to receive the wash water

- **Spill Control Practices**

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup**:**

- Manufacturers' recommended methods for spill cleanup will be clearly posted. All personnel will be made aware of procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area. Equipment and materials will include as appropriate, brooms, dust pans, mops, rags, gloves, oil absorbents, sand, sawdust, and plastic and metal trash containers.
- All spills will be cleaned up immediately after discovery.

- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contract with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
- The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
- Spills of products will be cleaned up promptly. Wastes from spill clean up will be disposed in accordance with appropriate regulations.

D. Other State and Local Plans

This BMP plan shall include any requirements specified in sediment and erosion control plans, storm water management plans or permits that have been approved by other state or local officials. Upon submittal of the NOI, other requirements for surface water protection are incorporated by reference into and are enforceable under this permit (even if they are not specifically included in this BMP plan). This provision does not apply to master or comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state or local officials. (1)

E. Maintenance

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.

- Maintenance of BMPs during construction shall be a result of weekly and post rain event inspections with action being taken by the contractor to correct deficiencies.

- Post Construction maintenance will be a function of normal highway maintenance operations. Following final project acceptance by the cabinet, district highway crews will be responsible for identification and correction of deficiencies regarding ground cover and cleaning of storm water BMPs. The project manager shall identify any BMPs that will be for the purpose of post construction storm water management with specific guidance for any non-routine maintenance. (1)

F. Inspections

Inspection and maintenance practices that will be used to maintain erosion and sediment controls:

- All erosion prevention and sediment control measures will be inspected at least once each week and following any rain of one-half inch or more.
- Inspections will be conducted by individuals that have received KyTC Grade Level II training or other qualification as prescribed by the cabinet that includes instruction concerning sediment and erosion control.
- Inspection reports will be written, signed, dated, and kept on file.
- Areas at final grade will be seeded and mulched within 14 days.
- Areas that are not at final grade where construction has ceased for a period of 21 days or longer and soil stock piles shall receive temporary mulch no later than 14 days from the last construction activity in that area.
- All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of being reported.
- Built-up sediment will be removed from behind the silt fence before it has reached halfway up the height of the fence.
- Silt fences will be inspected for bypassing, overtopping, undercutting, depth of sediment, tears, and to ensure attachment to secure posts.
- Sediment basins will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 70 percent of the design capacity and at the end of the job.
- Diversion dikes and berms will be inspected and any breaches promptly repaired. Areas that are eroding or scouring will be repaired and re-seeded / mulched as needed.
- Temporary and permanent seeding and mulching will be inspected for bare spots, washouts, and healthy growth. Bare or eroded areas will be repaired as needed.
- All material storage and equipment servicing areas that involve the management of bulk liquids, fuels, and bulk solids will be inspected weekly for conditions that represent a release or possible release of pollutants to the environment.

G. Non – Storm Water discharges

It is expected that non-storm water discharges may occur from the site during the construction period. Examples of non-storm water discharges include:

- Water from water line flushings.

- Water form cleaning concrete trucks and equipment.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
- Uncontaminated groundwater and rain water (from dewatering during excavation).

All non-storm water discharges will be directed to the sediment basin or to a filter fence enclosure in a flat vegetated infiltration area or be filtered via another approved commercial product.

H. Groundwater Protection Plan (3)

This plan serves as the groundwater protection plan as required by 401 KAR 5:037.

- Contractors statement: (3)

The following activities, as enumerated by 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan, will or may be may be conducted as part of this construction project:

_____ 2. (e) land treatment or land disposal of a pollutant;

_____ 2. (f) Storing, …, or related handling of hazardous waste, solid waste or special waste, …, in tanks, drums, or other containers, or in piles, (This does not include wastes managed in a container placed for collection and removal of municipal solid waste for disposal off site);

_____ 2. (g) …. Handling of materials in bulk quantities (equal or greater than 55 gallons or 100 pounds net dry weight transported held in an individual container) that, if released to the environment, would be a pollutant;

_____ 2. (j) Storing or related handling of road oils, dust suppressants, …., at a central location;

_____ 2. (k) Application or related handling of road oils, dust suppressants or deicing materials, (does not include use of chloride-based deicing materials applied to roads or parking lots);

_____ 2. (m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes, (this does not include bore holes for the purpose of explosive demolition);

Or, check the following only if there are no qualifying activities

_____ There are no activities for this project as listed in 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan.

The contractor is responsible for the preparation of a plan that addresses the

401 KAR 5:037 Section 3. (3) Elements of site specific groundwater protection plan:

(a) General information about this project is covered in the Project information;
(b) Activities that require a groundwater protection plan have been identified above;
(c) Practices that will protect groundwater from pollution are addressed in section C. Other control measures.
(d) Implementation schedule – all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity;
(e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provide to the resident engineer.
(f) Areas of the project and groundwater plan activities will be inspected as part of the weekly sediment and erosion control inspections
(g) Certification (see signature page.)

KyTC BMP Plan for Project PCN ## -

Contractor and Resident Engineer Plan certification

The contractor that is responsible for implementing this BMP plan is identified in the Project Information section of this plan.

The following certification applies to all parties that are signatory to this BMP plan:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, this plan complies with the requirements of 401 KAR 5:037. By this certification, the undersigned state that the individuals signing the plan have reviewed the terms of the plan and will implement its provisions as they pertain to ground water protection.

Resident Engineer and Contractor Certification:

(2) Resident Engineer signature

Signed _____title_____, _____
Typed or printed name[2] signature

(3) Signed _____title_____, _____
Typed or printed name[1] signature

1. Contractors Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.

2. KyTC note: to be signed by the Chief District Engineer or a person designated to have the authority to sign reports by such a person (usually the resident engineer) in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601 Reference the Project Control Number (PCN) and KPDES number when one has been issued.

Sub-Contractor Certification

The following sub-contractor shall be made aware of the BMP plan and responsible for implementation of BMPs identified in this plan as follows:

Subcontractor

Name:
Address:
Address:

Phone:

The part of BMP plan this subcontractor is responsible to implement is:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System permit that authorizes the storm water discharges, the BMP plan that has been developed to manage the quality of water to be discharged as a result of storm events associated with the construction site activity and management of non-storm water pollutant sources identified as part of this certification.

Signed _____title_____, _____
Typed or printed name[1] signature

1. Sub Contractor Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.

DEP Department For Environmental Protection

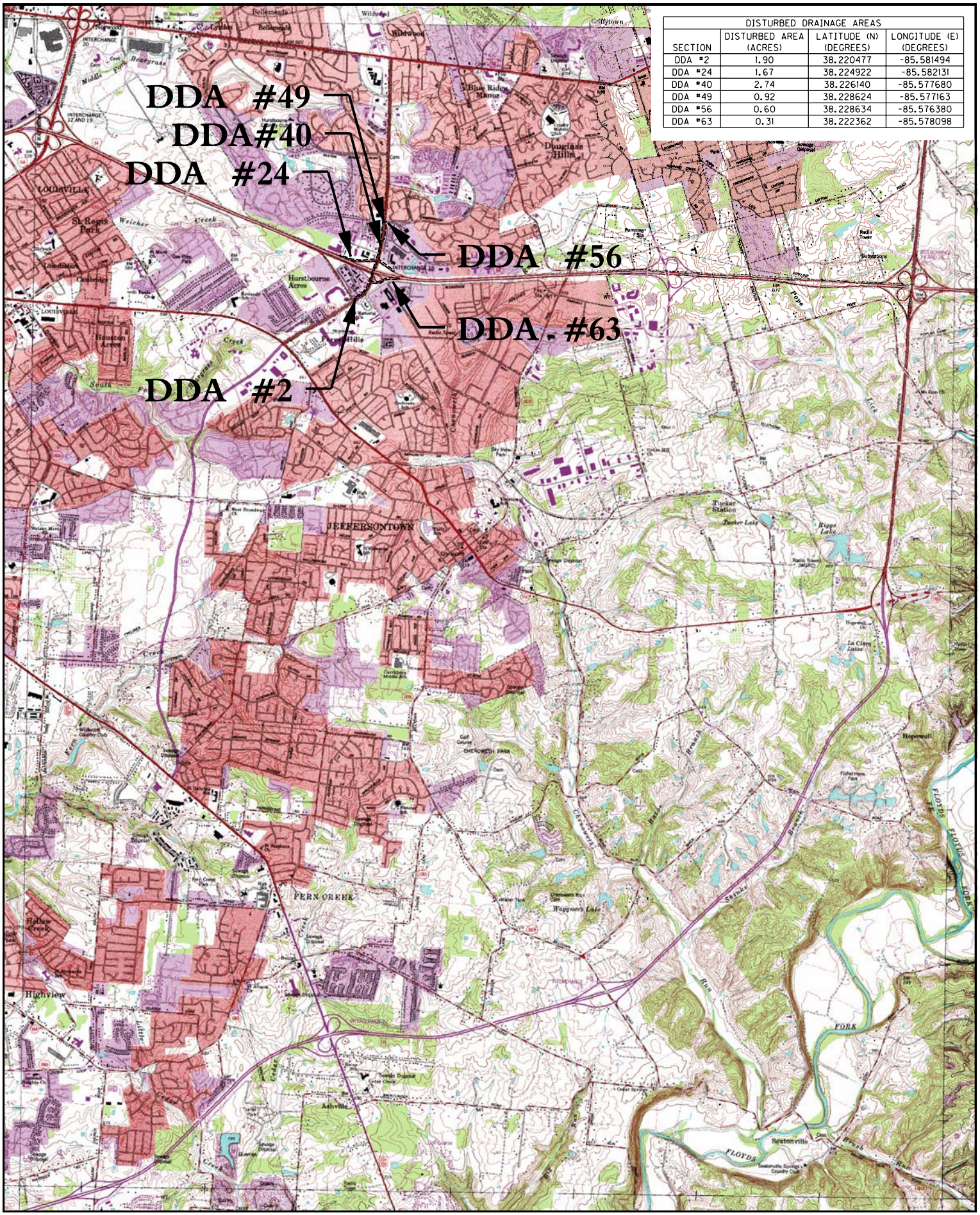
Welcome to the Department for Environmental Protection eForms Application.

Your eForm has been saved to our database and may be recalled in the future using the following eForm ID: "7c41f7f6-fd48-42d9-90e3-0458e6a7eb96" (minus the double quotes). Please note, since you selected to save your values, this does NOT constitute as submittal to the Kentucky Department of Environmental Protection (DEP). Please note that some eForms require you to submit supporting upload file(s) or attachments. Upload files/attachments are not saved to our system until a final submission; we only save the file path using this save and retrieval feature. To retrieve this saved eForm, the eForms application will require you to enter your eForm ID in the appropriate field. The url for the retrieval is htts://dep.gateway.ky.gov/eForms/default.aspx.

You have selected the following electronic form (eForm): KPDES FORM NOI-SW (Construction): (KPDES Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity Under the KPDES General Permit). You may continue with a blank eForm by clicking on the "Continue with Blank eForm" button below or retrieve a previously saved version by entering your eForm Transaction ID in the field provided below.

Option A: Select this option to fill out a blank eForm.	Continue with Blank eForm
Option B: Select this option to retrieve a previously saved or submitted eForm. The check box allows you to use previously saved/submitted eForms as a "template". The system will generate a new eForm Transaction ID allow you to submit the new form to DEP.	Enter your eForm Transaction ID to retreive the latest version of your form: 7c41f7f6-fd48-42d9-90e3-0458e6a7eb96 ☐ I want a NEW eForm with the values from the previously saved/submitted ID. Proceed

User Interface issues: 1. For Security reasons, the website only supports 45 minutes to complete data entry at any given time and will 'timeout', preventing the ability to save or submit your data. Please keep this in mind when filling out an eForm. 2. Please note that the Internet Explorer Browser uses the Backspace key as a Hot-Key for the Back button (Previous Page). When selecting values from a Dropdown List, using the backspace key will take you to the previous page and you will need to reenter your information.



DISTURBED DRAINAGE AREAS			
SECTION	DISTURBED AREA (ACRES)	LATITUDE (N) (DEGREES)	LONGITUDE (E) (DEGREES)
DDA #2	1.90	38.220477	-85.581494
DDA #24	1.67	38.224922	-85.582131
DDA #40	2.74	38.226140	-85.577680
DDA #49	0.92	38.228624	-85.577163
DDA #56	0.60	38.228634	-85.576380
DDA #63	0.31	38.222362	-85.578098

KENTUCKY TRANSPORTATION CABINET

COMMUNICATING ALL PROMISES (CAP)

JEFFERSON COUNTY

5-52.00

(NO CAPS INVOLVED IN PROJECT)

May 11, 2012

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.*

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SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

This Special Note will apply when indicated on the plans or in the proposal.

1.0 DESCRIPTION. Furnish, install, operate, and maintain variable message signs at the locations shown on the plans or designated by the Engineer. Remove and retain possession of variable message signs when they are no longer needed on the project.

2.0 MATERIALS.

2.1 General. Use LED Variable Message Signs Class I, II, or III, as appropriate, from the Department's List of Approved Materials.

Unclassified signs may be submitted for approval by the Engineer. The Engineer may require a daytime and nighttime demonstration. The Engineer will make a final decision within 30 days after all required information is received.

2.2 Sign and Controls. All signs must:

1) Provide 3-line messages with each line being 8 characters long and at least 18 inches tall. Each character comprises 35 pixels.
2) Provide at least 40 preprogrammed messages available for use at any time. Provide for quick and easy change of the displayed message; editing of the message; and additions of new messages.
3) Provide a controller consisting of:
   a) Keyboard or keypad.
   b) Readout that mimics the actual sign display. (When LCD or LCD type readout is used, include backlighting and heating or otherwise arrange for viewing in cold temperatures.)
   c) Non-volatile memory or suitable memory with battery backup for storing pre-programmed messages.
   d) Logic circuitry to control the sequence of messages and flash rate.
4) Provide a serial interface that is capable of supporting complete remote control ability through land line and cellular telephone operation. Include communication software capable of immediately updating the message, providing complete sign status, and allowing message library queries and updates.
5) Allow a single person easily to raise the sign to a satisfactory height above the pavement during use, and lower the sign during travel.
6) Be Highway Orange on all exterior surfaces of the trailer, supports, and controller cabinet.
7) Provide operation in ambient temperatures from -30 to + 120 degrees Fahrenheit during snow, rain and other inclement weather.
8) Provide the driver board as part of a module. All modules are interchangeable, and have plug and socket arrangements for disconnection and reconnection. Printed circuit boards associated with driver boards have a conformable coating to protect against moisture.
9) Provide a sign case sealed against rain, snow, dust, insects, etc. The lens is UV stabilized clear plastic (polycarbonate, acrylic, or other approved material) angled to prevent glare.
10) Provide a flat black UV protected coating on the sign hardware, character PCB, and appropriate lens areas.
11) Provide a photocell control to provide automatic dimming.

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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/⇒⇒⇒/
/KEEP/LEFT/⇐⇐⇐/
/LOOSE/GRAVEL/AHEAD/
/RD WORK/NEXT/**MILES/
/TWO WAY/TRAFFIC/AHEAD/
/PAINT/CREW/AHEAD/
/REDUCE/SPEED/**MPH/
/BRIDGE/WORK/***0 FT/
/MAX/SPEED/**MPH/
/SURVEY/PARTY/AHEAD/
/MIN/SPEED/**MPH/
/ICY/BRIDGE/AHEAD/ /ONE LANE/BRIDGE/AHEAD/
/ROUGH/ROAD/AHEAD/
/MERGING/TRAFFIC/AHEAD/
/NEXT/***/MILES/
/HEAVY/TRAFFIC/AHEAD/
/SPEED/LIMIT/**MPH/
/BUMP/AHEAD/
/TWO/WAY/TRAFFIC/

*Insert numerals as directed by the Engineer.
Add other messages during the project when required by the Engineer.

2.3 Power.

1) Design solar panels to yield 10 percent or greater additional charge than sign consumption. Provide direct wiring for operation of the sign or arrow board from an external power source to provide energy backup for 21 days without sunlight and an on-board system charger with the ability to recharge completely discharged batteries in 24 hours.

3.0 CONSTRUCTION. Furnish and operate the variable message signs as designated on the plans or by the Engineer. Ensure the bottom of the message panel is a minimum of 7 feet above the roadway in urban areas and 5 feet above in rural areas when operating. Use Class I, II, or III signs on roads with a speed limit less than 55 mph. Use Class I or II signs on roads with speed limits 55 mph or greater.

Maintain the sign in proper working order, including repair of any damage done by others, until completion of the project. When the sign becomes inoperative, immediately repair or replace the sign. Repetitive problems with the same unit will be cause for rejection and replacement.

Use only project related messages and messages directed by the Engineer, unnecessary messages lessen the impact of the sign. Ensure the message is displayed in either one or 2 phases with each phase having no more than 3 lines of text. When no message is needed, but it is necessary to know if the sign is operable, flash only a pixel.

When the sign is not needed, move it outside the clear zone or where the Engineer directs. Variable Message Signs are the property of the Contractor and shall be removed from the project when no longer needed. The Department will not assume ownership of these signs.

4.0 MEASUREMENT. The final quantity of Variable Message Sign will be

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the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

5.0 PAYMENT. The Department will pay for the Variable Message Signs at the unit price each. The Department will not pay for signs replaced due to damage or rejection. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to, operate, move, repair, and maintain or replace the variable message signs. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

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

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly takecorrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. **Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within thetime limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin,

age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of $10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. **General:**

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics

shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. **Classification:**

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. **Payment of Fringe Benefits:**

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. **Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:**

a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level ofprogress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable

classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under a approved definition, shall be paid not less than the applicable wage rate on the wagedetermination for the classification of work actually performed.

5. **Apprentices and Trainees (Programs of the U.S. DOT):**

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. **Withholding:**

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. **Overtime Requirements:**

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. **Violation:**

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. **Withholding for Unpaid Wages and Liquidated Damages:**

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any

liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. **Compliance with Copeland Regulations (29 CFR 3):**

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. **Payrolls and Payroll Records:**

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less that the applicable wage rate and fringe benefits or cash equivalent for the classification of worked performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than $1,000,000 (23 CFR 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provideall safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended andsupplemented;

Shall be fined not more that $10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. **Instructions for Certification - Primary Covered Transactions:**

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowinglyrendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

2. **Instructions for Certification - Lower Tier Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of $25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

EMPLOYMENT REQUIREMENTS
RELATING TO
NONDISCRIMINATION OF EMPLOYEES
(APPLICABLE TO FEDERAL-AID SYSTEM CONTRACTS)

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 administrating agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

REVISED: 12-3-92

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.

General Decision Number: KY120125 05/25/2012 KY125

Superseded General Decision Number: KY20100211

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	01/06/2012
1	01/13/2012
2	01/20/2012
3	04/13/2012
4	05/11/2012
5	05/25/2012

BRIN0004-003 06/01/2011

BRECKENRIDGE COUNTY

	Rates	Fringes
BRICKLAYER	$ 24.11	10.07

BRKY0001-005 06/01/2011

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

	Rates	Fringes
BRICKLAYER	$ 24.11	10.07

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 07/01/2011

	Rates	Fringes
CARPENTER	$ 25.95	13.26
Diver	$ 39.30	13.26
PILEDRIVERMAN	$ 26.20	13.26

ELEC0212-008 05/31/2011

BRACKEN, GALLATIN and GRANT COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 26.11	14.94

ELEC0212-014 06/27/2011

BRACKEN, GALLATIN & GRANT COUNTIES:

	Rates	Fringes
Sound & Communication Technician	$ 21.55	8.46

ELEC0317-012 06/01/2011

BOYD, CARTER, ELLIOT & ROWAN COUNTIES:

	Rates	Fringes
Electricians:		
Cable Splicer	$ 32.68	18.13
Electrician	$ 31.87	19.96

ELEC0369-007 06/01/2011

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	$ 29.27	13.33

ELEC0575-002 05/30/2011

FLEMING, GREENUP, LEWIS & MASON COUNTIES:

	Rates	Fringes
ELECTRICIAN	$ 30.69	13.32

* ENGI0181-018 07/01/2011

	Rates	Fringes
Operating Engineer:		
GROUP 1	$ 26.50	13.00
GROUP 2	$ 24.08	13.00
GROUP 3	$ 24.46	13.00
GROUP 4	$ 23.82	13.00

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 Conrete 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; 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 06/01/2011

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	18.10
Structural	$ 24.80	18.10

IRON0070-006 06/01/2011

ANDERSON, BOYLE, BRECKINRIDGE, BULLITT, FAYETTE, FRANKLIN,

GRAYSON, HARDIN, HENRY, JEFFERSON, JESSAMINE, LARUE, MADISON, MARION, MEADE, MERCER, NELSON, OLDHAM, SHELBY, SPENCER, TRIMBLE, WASHINGTON & WOODFORD
BOURBON (Southern two-thirds, including Townships of Austerlity, Centerville, Clintonville, Elizabeth, Hutchison, Littlerock, North Middletown & Paris);
CARROLL (Western two-thirds, including Townships of Carrollton, Easterday, English, Locust, Louis, Prestonville & Worthville);
CLARK (Western two-thirds, including Townships of Becknerville, Flanagan, Ford, Pine Grove, Winchester & Wyandotte);
OWEN (Eastern eighth, including Townships of Glenmary, Gratz, Monterey, Perry Park & Tacketts Mill);
SCOTT (Southern third, including Townships of Georgetown, Great Crossing, Newtown, Stampling Ground & Woodlake);

	Rates	Fringes
IRONWORKER	$ 25.77	18.28

IRON0372-006 01/01/2012

BRACKEN, GALLATIN, GRANT, HARRISON and ROBERTSON
BOURBON (Northern third, including Townships of Jackson, Millersburg, Ruddel Mills & Shawhan);
CARROLL (Eastern third, including the Township of Ghent);
FLEMING (Western part, Excluding Townships of Beechburg, Colfax, Elizaville, Flemingsburg, Flemingsburg Junction, Foxport, Grange City, Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton, Pecksridge, Plummers Landing, Plummers Mill, Poplar Plains,
Ringos Mills, Tilton & Wallingford);
MASON (Western two-thirds, including Townships of Dover, Lewisburg, Mays Lick, Maysville, Minerva, Moranburg, Murphysville, Ripley, Sardis, Shannon, South Ripley & Washington);
NICHOLAS (Townships of Barefoot, Barterville, Carlisle, Ellisville, Headquarters, Henryville, Morningglory, Myers & Oakland Mills);
OWEN (Townships of Beechwood, Bromley, Fairbanks, Holbrook, Jonesville, Long Ridge, Lusby's Mill, New, New Columbus, New Liberty, Owenton, Poplar Grove, Rockdale, Sanders, Teresita & Wheatley);
SCOTT (Northern two-thirds, including Townships of Biddle, Davis,Delaplain, Elmville, Longlick, Muddy Ford, Oxford, Rogers Gap, Sadieville, Skinnersburg & Stonewall) COUNTIES

	Rates	Fringes
IRONWORKER, REINFORCING		
Beyond 30-mile radius of Hamilton County, Ohio Courthouse	$ 26.75	17.55
Up to & including 30-mile radius of Hamilton County, Ohio Courthouse	$ 26.50	17.55

IRON0769-007 06/01/2011

BATH, BOYD, CARTER, ELLIOTT, GREENUP, LEWIS, MONTGOMERY & ROWAN
CLARK (Eastern third, including townships of Bloomingdale,
Hunt, Indian Fields, Kiddville, Loglick, Rightangele & Thomson);
FLEMING (Townships of Beechburg, Colfax, Elizaville,
Flemingsburg, Flemingsburg Junction, Foxport, Grange City,
Hillsboro, Hilltop, Mount Carmel, Muses Mills, Nepton,
Pecksridge, Plummers Landing, Plummers Mill, Poplar Plains,
Ringos Mills, Tilton & Wallingford);
MASON (Eastern third, including Townships of Helena, Marshall,
Orangeburg, Plumville & Springdale);
NICHOLAS (Eastern eighth, including the Township of Moorefield
Sprout)

	Rates	Fringes
IRONWORKER	$ 30.96	18.07
ZONE 1	$ 29.59	18.07
ZONE 2	$ 31.36	18.07
ZONE 3	$ 32.96	18.07

ZONE 1 - Up to 10 mi. radius of union hall, Ashland, Ky.,
1643 Greenup Avenue
ZONE 2 - 10 to 50 mi. radius of union hall;
ZONE 3 - 50 mi. radius and beyond

LABO0189-003 07/01/2011

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	$ 20.81	10.85
GROUP 2	$ 21.06	10.85
GROUP 3	$ 21.11	10.85
GROUP 4	$ 21.71	10.85

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; Bushammer; 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

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LABO0189-008 07/01/2011

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

	Rates	Fringes
Laborers:		
GROUP 1	$ 21.26	10.40
GROUP 2	$ 21.51	10.40
GROUP 3	$ 21.56	10.40
GROUP 4	$ 22.16	10.40

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; Bushammer; 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

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LABO0189-009 07/01/2011

BRECKINRIDGE & GRAYSON COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1	$ 21.51	10.15
GROUP 2	$ 21.76	10.15
GROUP 3	$ 21.81	10.15
GROUP 4	$ 22.41	10.15

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; Bushammer; 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

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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 05/02/2011

BRACKEN, GALLATIN, GRANT, MASON & OWEN COUNTIES:

	Rates	Fringes
PAINTER (Heavy & Highway Bridges - Guardrails - Lightpoles - Striping)		
Bridge Equipment Tender and Containment Builder	$ 20.27	8.10
Brush & Roller	$ 23.85	8.10
Elevated Tanks; Steeplejack Work; Bridge & Lead Abatement	$ 23.85	8.10
Sandblasting & Water Blasting	$ 24.60	8.10
Spray	$ 24.35	8.10

PAIN0118-004 05/01/2010

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	10.30
Spray, Sandblast, Power		

Tools, Waterblast & Steam Cleaning	$ 19.50	10.30

PAIN1072-003 12/01/2011

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

	Rates	Fringes
Painters:		
Bridges; Locks; Dams; Tension Towers & Energized Substations	$ 29.33	14.20
Power Generating Facilities	$ 26.09	14.20

PLUM0248-003 06/01/2011

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

	Rates	Fringes
Plumber and Steamfitter	$ 32.00	16.24

PLUM0392-007 09/01/2011

BRACKEN, CARROLL (Eastern Half), GALLATIN, GRANT, MASON, OWEN & ROBERTSON COUNTIES:

	Rates	Fringes
Plumbers and Pipefitters	$ 29.30	15.74

PLUM0502-003 08/01/2011

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	$ 31.00	16.13

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

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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

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 rate.

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 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-11-III- HWY dated August 04, 2011

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.

Ryan Griffith, Director
Division of Construction Procurement
Frankfort, Kentucky 40622

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (Executive Order 11246)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

GOALS FOR MINORITY PARTICIPATION IN EACH TRADE	GOALS FOR FEMALE PARTICIPATION IN EACH TRADE
11.2%	6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally-assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4, 3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten (10) working days of award of any construction subcontract in excess of $10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed. The notification shall be mailed to:

Evelyn Teague, Regional Director
Office of Federal Contract Compliance Programs
61 Forsyth Street, SW, Suite 7B75
Atlanta, Georgia 30303-8609

4. As used in this Notice, and in the contract resulting from this solicitation, the **"covered area"** is Jefferson County.

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

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 121329 PAGE: 1
COUNTY: JEFFERSON LETTING: 06/15/12
PROPOSAL: IM 0642 (178) CALL NO: 105

LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
	SECTION 0001	PAVING			
0010	00001	DGA BASE	4,372.000 TON		
0020	00100	ASPHALT SEAL AGGREGATE	20.300 TON		
0030	00190	LEVELING & WEDGING PG64-22	262.000 TON		
0040	00214	CL3 ASPH BASE 1.00D PG64-22	5,471.000 TON		
0050	00291	EMULSIFIED ASPHALT RS-2	2.600 TON		
0060	02069	JPC PAVEMENT-10 IN	728.000 SQYD		
0070	02101	CEM CONC ENT PAVEMENT-8 IN	490.000 SQYD		
0080	22906ES403	CL3 ASPH SURF 0.38A PG64-22	1,147.000 TON		
	SECTION 0002	ROADWAY			
0090	00001	DGA BASE	296.000 TON		
0100	00078	CRUSHED AGGREGATE SIZE NO 2	126.000 TON		
0110	01010	NON-PERFORATED PIPE-4 IN	10.000 LF		
0120	01310	REMOVE PIPE	997.000 LF		
0130	01584	CAP DROP BOX INLET	6.000 EACH		
0140	01585	REMOVE DROP BOX INLET	16.000 EACH		
0150	01705	REMOVE CURB & GUTTER BOX INLET	3.000 EACH		
0160	01787	REMOVE MANHOLE	1.000 EACH		
0170	01791	ADJUST MANHOLE FRAME TO GRADE	2.000 EACH		
0180	01810	STANDARD CURB AND GUTTER	4,691.000 LF		
0190	01875	STANDARD HEADER CURB	101.000 LF		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 121329 PAGE: 2
COUNTY: JEFFERSON LETTING: 06/15/12
PROPOSAL: IM 0642 (178) CALL NO: 105

LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
0200	01890	ISLAND HEADER CURB TYPE 1	441.000 LF		
0210	01921	STANDARD BARRIER MEDIAN TYPE 4	151.000 SQYD		
0220	01982	DELINEATOR FOR GUARDRAIL MONO DIRECTIONA	WHITE 12.000 EACH		
0230	01984	DELINEATOR FOR BARRIER - WHITE	7.000 EACH		
0240	01989	CONC MEDIAN BARRIER TYPE 14C2	352.000 LF		
0250	02230	EMBANKMENT IN PLACE	6,755.000 CUYD		
0260	02242	WATER	1,348.000 MGAL		
0270	02262	FENCE-WOVEN WIRE TYPE 1	561.000 LF		
0280	02265	REMOVE FENCE	705.000 LF		
0290	02351	GUARDRAIL-STEEL W BEAM-S FACE	925.000 LF		
0300	02367	GUARDRAIL END TREATMENT TYPE 1	4.000 EACH		
0310	02369	GUARDRAIL END TREATMENT TYPE 2A	2.000 EACH		
0320	02381	REMOVE GUARDRAIL	432.000 LF		
0330	02382	GUARDRAIL CONNECT-SHLD BRIDGE PIER TY A	2.000 EACH		
0340	02460	REMOVE TREES OR STUMPS	4.000 EACH		
0350	02545	CLEARING AND GRUBBING (5 ACRES)	(1.00) LS		
0360	02562	SIGNS	900.000 SQFT		
0370	02585	EDGE KEY	100.000 LF		
0380	02599	FABRIC-GEOTEXTILE TYPE IV	400.000 SQYD		
0390	02600	FABRIC GEOTEXTILE TY IV FOR PIPE	1,709.000 SQYD	2.00	3,418.00
0400	02625	REMOVE HEADWALL	19.000 EACH		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 121329 PAGE: 3
COUNTY: JEFFERSON LETTING: 06/15/12
PROPOSAL: IM 0642 (178) CALL NO: 105

LINE NO	ITEM	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT PRICE	AMOUNT
0410	02650	MAINTAIN & CONTROL TRAFFIC	(1.00)	LS		
0420	02671	PORTABLE CHANGEABLE MESSAGE SIGN	2.000	EACH		
0430	02676	MOBILIZATION FOR MILL & TEXT	(1.00)	LS		
0440	02677	ASPHALT PAVE MILLING & TEXTURING	377.000	TON		
0450	02701	TEMP SILT FENCE	2,950.000	LF		
0460	02703	SILT TRAP TYPE A	6.000	EACH		
0470	02704	SILT TRAP TYPE B	6.000	EACH		
0480	02705	SILT TRAP TYPE C	50.000	EACH		
0490	02706	CLEAN SILT TRAP TYPE A	12.000	EACH		
0500	02707	CLEAN SILT TRAP TYPE B	12.000	EACH		
0510	02708	CLEAN SILT TRAP TYPE C	100.000	EACH		
0520	02709	CLEAN TEMP SILT FENCE	2,950.000	LF		
0530	02720	SIDEWALK-4 IN CONCRETE	1,889.000	SQYD		
0540	02721	REMOVE CONCRETE SIDEWALK	133.000	SQYD		
0550	02726	STAKING	(1.00)	LS		
0560	02775	ARROW PANEL	4.000	EACH		
0570	03287	SIDEWALK RAMP TYPE 1	32.000	EACH		
0580	03289	SIDEWALK RAMP TYPE 3	1.000	EACH		
0590	04880	STEEL STRAIN POLE	2.000	EACH		
0600	05950	EROSION CONTROL BLANKET	1,334.000	SQYD		
0610	05952	TEMP MULCH	23,110.000	SQYD		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 121329 PAGE: 4
COUNTY: JEFFERSON LETTING: 06/15/12
PROPOSAL: IM 0642 (178) CALL NO: 105

LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
0620	05966	TOPDRESSING FERTILIZER	0.960 TON		
0630	05985	SEEDING AND PROTECTION	18,405.000 SQYD		
0640	05989	SPECIAL SEEDING CROWN VETCH	2,314.000 SQYD		
0650	05990	SODDING	2,830.000 SQYD		
0660	06417	FLEXIBLE DELINEATOR POST-W	20.000 EACH		
0670	06418	FLEXIBLE DELINEATOR POST-Y	12.000 EACH		
0680	06510	PAVE STRIPING-TEMP PAINT-4 IN	6,000.000 LF		
0690	06511	PAVE STRIPING-TEMP PAINT-6 IN	4,000.000 LF		
0700	06514	PAVE STRIPING-PERM PAINT-4 IN	10,297.000 LF		
0710	06516	PAVE STRIPING-PERM PAINT-8 IN	989.000 LF		
0720	06540	PAVE STRIPING-THERMO-4 IN W	885.000 LF		
0730	06541	PAVE STRIPING-THERMO-4 IN Y	54.000 LF		
0740	06568	PAVE MARKING-THERMO STOP BAR-24IN	318.000 LF		
0750	06572	PAVE MARKING-DOTTED LANE EXTEN	273.000 LF		
0760	06573	PAVE MARKING-THERMO STR ARROW	1.000 EACH		
0770	06574	PAVE MARKING-THERMO CURV ARROW	28.000 EACH		
0780	06575	PAVE MARKING-THERMO COMB ARROW	2.000 EACH		
0790	06576	PAVE MARKING-THERMO ONLY	6.000 EACH		
0800	06578	PAVE MARKING-THERMO MERGE ARROW	9.000 EACH		
0810	06585	PAVEMENT MARKER TY IVA-MW TEMP	48.000 EACH		
0820	08100	CONCRETE-CLASS A	88.520 CUYD		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 121329 PAGE: 5
COUNTY: JEFFERSON LETTING: 06/15/12
PROPOSAL: IM 0642 (178) CALL NO: 105

LINE NO	ITEM	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT PRICE	AMOUNT
0830	08150	STEEL REINFORCEMENT	195.000	LB		
0840	08900	CRASH CUSHION TY VI CLASS B TL2	1.000	EACH		
0850	10020NS	FUEL ADJUSTMENT	9,400.000	DOLL	1.00	9,400.00
0860	10030NS	ASPHALT ADJUSTMENT	16,565.000	DOLL	1.00	16,565.00
0870	20099ES842	PAVE MARK TEMP PAINT STOP BAR	100.000	LF		
0880	20242NN	PLUG MANHOLE	1.000	EACH		
0890	20550ND	SAWCUT PAVEMENT	8,067.000	LF		
0900	20758ED	REMOVE AND RESET PERF PIPE HEADWALL	1.000	EACH		
0910	21431ED	MODULAR GLARE SCREEN	352.000	LF		
0920	22854EN	PAVE STRIPE PERM-6 IN HD21-WHITE	3,687.000	LF		
0930	22855EN	PAVE STRIPE PERM-6 IN HD21-YELLOW	799.000	LF		
0940	22856EN	PAVE STRIPE PERM-12 IN HD21-WHITE	502.000	LF		
0950	23131ER701	PIPELINE VIDEO INSPECTION	1,592.000	LF		
0960	23158ES505	DETECTABLE WARNINGS	442.000	SQFT		
0970	23163ED	TEMPORARY SIGNAL MODIFICATION	5.000	EACH		
0980	23274EN11F	TURF REINFORCEMENT MAT 1	104.000	SQYD		
0990	24472ED	PLUG JUNCTION BOX	2.000	EACH		
1000	24473ED	PLUG DROP BOX	2.000	EACH		
	SECTION 0003	DRAINAGE				
1010	00462	CULVERT PIPE-18 IN	16.200	LF		
1020	00464	CULVERT PIPE-24 IN	22.000	LF		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 121329 PAGE: 6
COUNTY: JEFFERSON LETTING: 06/15/12
PROPOSAL: IM 0642 (178) CALL NO: 105

LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
1030	00521	STORM SEWER PIPE-15 IN	30.500 LF		
1040	00522	STORM SEWER PIPE-18 IN	2,525.000 LF		
1050	00524	STORM SEWER PIPE-24 IN	311.300 LF		
1060	00526	STORM SEWER PIPE-30 IN	37.900 LF		
1070	00528	STORM SEWER PIPE-36 IN	10.000 LF		
1080	00560	STORM SEWER PIPE-48 IN EQUIV	39.000 LF		
1090	00980	SLOTTED DRAIN PIPE-12 IN	100.000 LF		
1100	01440	SLOPED BOX INLET-OUTLET TYPE 1	1.000 EACH		
1110	01450	S & F BOX INLET-OUTLET-18 IN	3.000 EACH		
1120	01505	DROP BOX INLET TYPE 5B	1.000 EACH		
1130	01508	DROP BOX INLET TYPE 5C	1.000 EACH		
1140	01559	DROP BOX INLET TYPE 13G	38.000 EACH		
1150	01568	DROP BOX INLET TYPE 13S	4.000 EACH		
1160	01580	DROP BOX INLET TYPE 15	1.000 EACH		
1170	01587	DROP BOX INLET TYPE 16S	1.000 EACH		
1180	01642	JUNCTION BOX-18 IN	2.000 EACH		
1190	01756	MANHOLE TYPE A	2.000 EACH		
1200	01767	MANHOLE TYPE C	3.000 EACH		
1210	20242NN	PLUG MANHOLE	1.000 EACH		
1220	24472ED	PLUG JUNCTION BOX	2.000 EACH		
1230	24473ED	PLUG DROP BOX	2.000 EACH		

SECTION 0004 SIGNING

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 121329 PAGE: 7
COUNTY: JEFFERSON LETTING: 06/15/12
PROPOSAL: IM 0642 (178) CALL NO: 105

LINE NO	ITEM	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT PRICE	AMOUNT
1240	06405	SBM ALUMINUM PANEL SIGNS	421.000	SQFT		
1250	06406	SBM ALUM SHEET SIGNS .080 IN	252.000	SQFT		
1260	06407	SBM ALUM SHEET SIGNS .125 IN	283.000	SQFT		
1270	06410	STEEL POST TYPE 1	985.000	LF		
1280	06449	REM OVERHEAD SIGN SUPPORT STR	1.000	EACH		
1290	06450	REM OVERHEAD STRUC CONC BASE	1.000	EACH		
1300	06490	CLASS A CONCRETE FOR SIGNS	7.820	CUYD		
1310	20418ED	REMOVE & RELOCATE SIGNS	8.000	EACH		
1320	21373ND	REMOVE SIGN	3.000	EACH		
1330	21596ND	GMSS TYPE D	32.000	EACH		
	SECTION 0005	SIGNALIZATION				
1340	04793	CONDUIT-1 1/4 IN	270.000	LF		
1350	04795	CONDUIT-2 IN	540.000	LF		
1360	04811	JUNCTION BOX TYPE B	1.000	EACH		
1370	04820	TRENCHING AND BACKFILLING	710.000	LF		
1380	04844	CABLE-NO. 14/5C	9,347.000	LF		
1390	04871	POLE 35 FT WOODEN	3.000	EACH		
1400	04880	STEEL STRAIN POLE	4.000	EACH		
1410	04884	ANCHOR	6.000	EACH		
1420	04885	MESSENGER-10800 LB	375.000	LF		
1430	04886	MESSENGER-15400 LB	2,275.000	LF		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 121329 PAGE: 8
COUNTY: JEFFERSON LETTING: 06/15/12
PROPOSAL: IM 0642 (178) CALL NO: 105

LINE NO	ITEM	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT PRICE	AMOUNT
1440	04931	INSTALL CONTROLLER TYPE 170	5.000	EACH		
1450	04932	INSTALL STEEL STRAIN POLE	16.000	EACH		
1460	04950	REMOVE SIGNAL EQUIPMENT	5.000	EACH		
1470	06472	INSTALL SPAN MOUNTED SIGN	6.000	EACH		
1480	20094ES835	TEMP RELOCATION OF SIGNAL HEAD	54.000	EACH		
1490	20188NS835	INSTALL LED SIGNAL-3 SECTION	50.000	EACH		
1500	20266ES835	INSTALL LED SIGNAL- 4 SECTION	2.000	EACH		
1510	20408ES835	INSTALL LED BEACON-12 IN	5.000	EACH		
1520	21543EN	BORE AND JACK CONDUIT	100.000	LF		
1530	21743NN	INSTALL PEDESTRIAN DETECTOR	20.000	EACH		
1540	23064NN	INSTALL SIGNAL-PEDESTRIAN COUNTDOWN	20.000	EACH		
1550	23157EN	TRAFFIC SIGNAL POLE BASE	87.270	CUYD		
1560	23222EC	INSTALL SIGNAL PEDESTAL	11.000	EACH		
1570	24133EC	INSTALL SIGNAL SENSOR SYSTEM	5.000	EACH		
	SECTION 0006	LIGHTING				
1580	04700	POLE 30 FT MTG HT	6.000	EACH		
1590	04701	POLE 40 FT MTG HT	25.000	EACH		
1600	04721	BRACKET 6 FT	3.000	EACH		
1610	04722	BRACKET 8 FT	2.000	EACH		
1620	04724	BRACKET 12 FT	9.000	EACH		
1630	04725	BRACKET 15 FT	17.000	EACH		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
1640	04740	POLE BASE	31.000 EACH		
1650	04750	TRANSFORMER BASE	31.000 EACH		
1660	04761	LIGHTING CONTROL EQUIPMENT	1.000 EACH		
1670	04770	HPS LUMINAIRE	31.000 EACH		
1680	04780	FUSED CONNECTOR KIT	85.000 EACH		
1690	04793	CONDUIT-1 1/4 IN	2,727.000 LF		
1700	04795	CONDUIT-2 IN	4,618.000 LF		
1710	04820	TRENCHING AND BACKFILLING	6,504.000 LF		
1720	04834	WIRE-NO. 6	11,496.000 LF		
1730	04835	WIRE-NO. 4	2,685.000 LF		
1740	04836	WIRE-NO. 2	8,920.000 LF		
1750	04940	REMOVE LIGHTING	(1.00) LS		
1760	20391NS835	JUNCTION BOX TYPE A	10.000 EACH		
1770	20392NS835	JUNCTION BOX TYPE C	8.000 EACH		
1780	21543EN	BORE AND JACK CONDUIT	791.000 LF		
1790	23675EC	WIRE-NO. 12-INSTALL	4,770.000 LF		
1800	24474ED	WIRE-NO.8-INSTALL	8,865.000 LF		
	SECTION 0007	INTELLIGENT TRANSPORTATION SYSTEMS			
1810	03381	PVC PIPE-2 IN	2,230.000 LF		
1820	04795	CONDUIT-2 IN	1,265.000 LF		
1830	04820	TRENCHING AND BACKFILLING	2,138.000 LF		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
1840	20392NS835	JUNCTION BOX TYPE C	9.000 EACH		
1850	21071ND	DATA SURGE DEVICE	7.000 EACH		
1860	21076ND	FIBER TERMINATION RACK	5.000 EACH		
1870	21077ED	FIBER OPTIC CABLE	3,695.000 LF		
1880	21458ND	FIBER TRANSCEIVER SIGN	10.000 EACH		
1890	21543EN	BORE AND JACK CONDUIT	1,357.000 LF		
1900	22403NN	WEB CAMERA ASSEMBLY	2.000 EACH		
1910	23068NN	REMOVE & REINSTALL COORDINATING UNIT	1.000 EACH		
1920	23150NN	COMMUNICATION CABLE	300.000 LF		
1930	24495EC	ADAPTIVE SIGNAL SYSTEM	5.000 EACH		
	SECTION 0008	WATERLINE			
1940	01093	DUCTILE IRON PIPE-6 IN	60.000 LF		
1950	01099	DUCTILE IRON PIPE-12 IN	10.000 LF		
1960	03466	TIE-IN 6 IN	2.000 EACH		
1970	03472	TIE-IN 12 IN	1.000 EACH		
1980	03474	TIE-IN 24 IN	4.000 EACH		
1990	03526	GATE VALVE-6 IN	1.000 EACH		
2000	03532	GATE VALVE-12 IN	1.000 EACH		
2010	03545	BEND 22.50 DEG 6 IN	2.000 EACH		
2020	03554	BEND 45 DEG 6 IN	5.000 EACH		
2030	03562	BEND 90 DEG 12 IN	1.000 EACH		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
2040	04821	OPEN CUT ROADWAY	360.000 LF		
2050	20127EC	SOLID SLEEVE-12 IN	1.000 EACH		
2060	20137EN	POLYWRAP	4,800.000 LF		
2070	20138EC	POLYTAPE	48.000 EACH		
2080	20697ND	ADJUST VALVE BOX TO GRADE	3.000 EACH		
2090	20828ED	GRIPPER GLAND 12 IN	6.000 EACH		
2100	20830ED	GRIPPER GLAND 6 IN	6.000 EACH		
2110	20831ND	REMOVE VALVE BOX	3.000 EACH		
2120	20834ED	KEYTUBE 7 IN	3.000 EACH		
2130	20835ND	ROUNDTOP AND LID #2	3.000 EACH		
2140	20961ND	PLUG-6 IN	2.000 EACH		
2150	21235ED	DUCTILE IRON PIPE-36 IN	2,430.000 LF		
2160	21455ND	ABANDON VALVE	3.000 EACH		
2170	22082NN	AIR RELEASE VALVE ASSEMBLY	2.000 EACH		
2180	23093ND	PLUG-12 IN	2.000 EACH		
2190	23197EC	PLUG-24 IN	4.000 EACH		
2200	23326EC	EXCAVATION-UNCLASSIFIED	750.000 CUYD		
2210	23358EC	TEE-6 IN X 6 IN	1.000 EACH		
2220	23742EC	REDUCER-36 X 24 IN	4.000 EACH		
2230	24498EC	ADD FOR RESTRAINED JOINTS-36 IN	1,000.000 LF		
2240	24499EC	SOLID SLEEVE-36 IN	4.000 EACH		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
2250	24500EC	GATE VALVE-36 IN	2.000 EACH		
2260	24501EC	TEMP BLOW-OFF 6 IN	2.000 EACH		
2270	24502EC	TEE 36 IN X 36 IN	1.000 EACH		
2280	24503EC	TEE 36 IN X 12 IN	1.000 EACH		
2290	24504EC	TEE 36 IN X 6 IN	1.000 EACH		
2300	24505EC	BEND 11.25 DEG-36 IN	7.000 EACH		
2310	24506EC	BEND 22.5 DEG-36 IN	3.000 EACH		
2320	24507EC	BEND 45 DEG-36 IN	37.000 EACH		
2330	24510EC	TIE-IN 36 IN	1.000 EACH		
2340	24511EC	CHLORINATION-FLUSH-PRESSURE TEST-36 IN	2.000 EACH		
2350	24512EC	HYDROSTATIC TEST 36 IN MAIN	2.000 EACH		
2360	24513EC	54-IN STEEL CASING BORE AND JACK	235.000 LF		
2370	24514ED	FOSTER ADAPTERS-12 IN	2.000 EACH		
	SECTION 0009	MOBILIZATION / DEMOBILIZATION			
2380	02568	MOBILIZATION (NO MORE THAN 5%)	LUMP		
2390	02569	DEMOBILIZATION (AT LEAST 1.5%)	LUMP		
		TOTAL BID			