



CALL NO. 106

CONTRACT ID. 171050

CLAY COUNTY

FED/STATE PROJECT NUMBER STP 6000 (112)

DESCRIPTION MEMORIAL DRIVE (KY-2432)

WORK TYPE GRADE, DRAIN & SURFACE WITH BRIDGE

PRIMARY COMPLETION DATE 7/30/2019

LETTING DATE: December 08,2017

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN STANDARD TIME December 08,2017. Bids will be publicly announced at 10:00 AM EASTERN STANDARD TIME.

PLANS AVAILABLE FOR THIS PROJECT.

DBE CERTIFICATION REQUIRED - 3.90%

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

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PART I
SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 11

CONTRACT ID - 171050

STP 6000(112)

COUNTY - CLAY

PCN - DE02624321750

STP 6000(112)

MEMORIAL DRIVE(KY-2432) RECONSTRUCT KY-2432 FROM SECOND STREET IN EAST MANCHESTER NORTH TO THE LEFT FORK OF COAL HOLLOW ROAD(MP 2.10), A DISTANCE OF 03.41 MILES.GRADE, DRAIN & SURFACE WITH BRIDGE SYP NO. 11-08001.00.

GEOGRAPHIC COORDINATES LATITUDE 37:09:46.00 LONGITUDE 83:45:18.00

COMPLETION DATE(S):

COMPLETED BY 07/30/2019

APPLIES TO ENTIRE CONTRACT

CONTRACT NOTES

PROPOSAL ADDENDA

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

BID SUBMITTAL

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

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

JOINT VENTURE BIDDING

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

UNDERGROUND FACILITY DAMAGE PROTECTION

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. When prescribed in said directives, the contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom shall be contacted through their individual Protection Notification Center. Non-compliance with these directives can result in the enforcement of penalties.

SPECIAL NOTE FOR COMPOSITE OFFSET BLOCKS

Contrary to the Standard Drawings (2016 edition) the Cabinet will allow 6" composite offset blocks in lieu of wooden offset blocks, except as specified on proprietary end treatments and crash cushions. The composite blocks shall be selected from the Cabinet's List of Approved Materials.

REGISTRATION WITH THE SECRETARY OF STATE BY A FOREIGN ENTITY

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

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

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

SPECIAL NOTE FOR PROJECT QUESTIONS DURING ADVERTISEMENT

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

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

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

HARDWOOD REMOVAL RESTRICTIONS

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

INSTRUCTIONS FOR EXCESS MATERIAL SITES AND BORROW SITES

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

ACCESS TO RECORDS

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

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

06/01/16

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
102.8 Irregular Proposals 102.14 Disqualification of Bidders
102.9 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.

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 14-35 DBE, within **5** 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 WILL 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 certainty 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 out 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 complete and submit a signed and notarized affidavit (TC 18-7) and copies of checks for any monies paid to each DBE subcontractor or supplier utilized to meet a DBE goal. **These documents must be submitted within 10 days of being paid by the Cabinet.**

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>

The prime contractor should notify the KYTC Office of Civil Rights and Small Business Development seven (7) days prior to DBE contractors commencing work on the project. The contact is Melvin Bynes and the telephone number is (502) 564-3601.

Photocopied payments and completed, signed and notarized affidavit must be submitted by the Prime Contractor 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.

1/27/2017

LEGAL REQUIREMENTS AND RESPONSIBILITY TO THE PUBLIC – CARGO PREFERENCE ACT (CPA).

(REV 12-17-15) (1-16)

SECTION 7 is expanded by the following new Article:

102.10 **Cargo Preference Act – Use of United States-flag vessels.**

Pursuant to Title 46CFR Part 381, the Contractor agrees

- To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

- To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph 1 of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

- To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

ASPHALT MIXTURE

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

INCIDENTAL SURFACING

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

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.

ASPHALT PAVEMENT RIDE QUALITY CATEGORY A

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

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.

MATERIAL TRANSFER VEHICLE (MTV)

Provide and use a MTV in accordance with Sections 403.02.10 and 403.03.05.

SPECIAL NOTE FOR INTELLIGENT COMPACTION OF AGGREGATE BASES

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's current edition of the Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. Provide and use Intelligent Compaction (IC) Rollers for compaction of Aggregate bases.

2.0 MATERIALS AND EQUIPMENT. The Contractor shall supply sufficient numbers of rollers and other associated equipment necessary to complete the compaction requirements for the specific materials. The Contractor will determine the number of IC rollers to use depending on the scope of the project. The IC roller(s) may be utilized during production with other standard compaction equipment and shall be used for the evaluation of the compaction operations. Provide at least one (1) roller to be used on the project with the following minimum characteristics:

- 1) Are self propelled vibratory rollers equipped with machine drive power and/or accelerometers mounted in or about the drum to measure the interactions between the rollers and compacted materials in order to evaluate the applied Compactive effort. www.IntelligentCompaction.com contains a list of acceptable rollers equipped with IC technology.
- 2) IC rollers are to be smooth drums either with dual drums or one drum and back rubber tires.
- 3) The output from the roller is designated as the IC-MV which represents the stiffness of the materials based on the vibration of the roller drums and the resulting response from the underlying materials, or the machine drive power value.
- 4) Are equipped with integrated on-board documentation systems that are capable of displaying real-time color-coded maps of IC measurement values including the stiffness response values, location of the roller, number of roller passes, machine settings, together with the speed, the frequency and amplitude of roller drums. Ensure the display unit is capable of transferring the data by means of a USB port.
- 5) Are equipped with a mounted Global Positioning System GPS radio and receiver either a Real Time Kinematic (RTK-GPS) or Global Navigational Satellite System (GNSS) units that monitor the location and track the number of passes of the rollers. Accuracy of the positioning system must be within 12 inches.

3.0 WORK PLAN. Submit to the Engineer an IC Work Plan at the Preconstruction Conference and/or at least 2 weeks prior to beginning the corresponding construction activities. Describe in the work plan the following:

1. Compaction equipment to be used including:
 - Vendor(s)
 - Roller model(s),

- Roller dimensions and weights,
 - Description of IC measurement system,
 - GPS capabilities,
 - Documentation system,
 - Software.
2. Roller data collection methods including sampling rates and intervals and data file types.
3. Transfer of data to the Engineer including method, timing, and personnel responsible. Data transfer shall be provided by a real time cloud data collecting and distribution system (ex. Visionlink). The Contractor will provide the Cabinet with any vendor specific software, user id, passwords, etc. needed to access the data through this service, cost of this access is incidental to the IC bid item(s).
4. Training plan and schedule for roller operators, project foreman, project surveyors, and Cabinet personnel; including both classroom and field training from the equipment manufacturer. Training should be conducted at least 1 week before beginning IC construction. The training is to be performed by a qualified representative(s) from the IC Roller manufacture(s) to be used on the project.

4.0 CONSTRUCTION. Prior to the start of production, ensure the proper setup of the GPS, IC roller(s) and the rover(s) by conducting joint GPS correlation and verification testing between the Contractor, GPS representative and IC roller manufacturer using the same datum. Use the project datum system (Northing, Easting and Elevation) when applicable.

1. Ensure GPS correlation and verification testing includes the following minimum processes:
 - a. Establish the GPS system to be used either one with a base station or one with mobile receivers only. Ensure all components in the system are set to the correct coordinate system; then,
 - b. Verify that the roller and rover are working properly and that there is a connection with the base station; then,
 - c. Record the coordinates of the two edges where the front drum of the roller is in contact with the ground from the on-board, color-coded display; then,
 - d. Mark the locations of the roller drum edges and move the roller, and place the mobile receiver at each mark and record the readings; then,
2. Compare coordinates between the roller and rover receivers. If the coordinates are within 12.0 in. of each other, the comparison is acceptable. If the coordinates are not within 12.0 in., diagnose and perform necessary corrections and repeat the above steps until verification is acceptable.

3. Do not begin work until acceptable GPS correlation and verification has been obtained. The Contractor and the Department should conduct random GPS verification testing during production to ensure data locations are accurate. The recommended rate is once per day with a requirement of at least once per week.
4. A test strip is to be used for all materials (DGA, CSB) as outlined and sized in section 302.03.04 to determine optimum rolling pattern, for all materials, and the target density for aggregate bases. A new test strip will be required anytime the material changes, equipment changes, or proper compaction has not been obtained for two (2) consecutive test locations.
5. All acceptance testing shall be as outlined in Standard Specifications sections 200 and 300.
6. Any areas a minimum of 50 square feet in area not achieving the 80% of the stiffness value determined by the latest control strip shall be tested by other means approved by the Engineer. If the material doesn't pass the testing it shall be repaired based on current standards to the satisfaction of the Engineer.

5.0 MEASUREMENT. The Department will measure the total tons of aggregate base (DGA and/or CSB) compacted using the IC roller(s). The use of non-IC rollers is allowed on this project, but an IC roller must be used as well.

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

1. All areas with a minimum of 80% pass coverage and 75% required stiffness readings.
2. Payment is full compensation for all work associated with providing IC equipped rollers, transmission of electronic data files, two copies of IC roller manufacturer software, and training.
3. Delays due to GPS satellite reception of signals to operate the IC equipment or IC roller breakdowns will not be considered justification for contract modifications or contract extensions.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24780EC	Intelligent Compaction for Aggregate	TON

Aug. 25, 2017

SPECIAL NOTE FOR INTELLIGENT COMPACTION OF ASPHALT MIXTURES

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction current edition.

1.0 DESCRIPTION. Provide and use Intelligent Compaction (IC) Rollers for compaction of all asphalt mixtures.

2.0 MATERIALS AND EQUIPMENT. In addition to the equipment specified in Subsection 403.02, a minimum of one (1) IC roller is to be used on the project at all times, two (2) IC rollers will be required when the paving train consists of three (3) or more rollers. The Contractor is to only use the IC roller(s) for compaction as the breakdown and/or intermediate roller(s). All IC rollers will meet the following minimum characteristics:

- 1) Are self propelled double-drum vibratory rollers equipped with accelerometers mounted in or about the drum to measure the interactions between the rollers and compacted materials in order to evaluate the applied compactive effort. The IC rollers must have the approval of the Engineer prior to use. Examples of rollers equipped with IC technology can be found at www.IntelligentCompaction.com.
- 2) Are equipped with non-contact temperature sensors for measuring pavement surface temperatures.
- 3) The output from the roller is designated as the IC-MV which represents the stiffness of the materials based on the vibration of the roller drums and the resulting response from the underlying materials.
- 4) Are equipped with integrated on-board documentation systems that are capable of displaying real-time color-coded maps of IC measurement values including the stiffness response values, location of the roller, number of roller passes, machine settings, together with the material temperature, speed and the frequency and amplitude of roller drums. Ensure the display unit is capable of transferring the data by means of a USB port.
- 5) Are equipped with a mounted Global Positioning System GPS radio and receiver either a Real Time Kinematic (RTK-GPS) or Global Navigational Satellite System (GNSS) units that monitor the location and track the number of passes of the rollers. Accuracy of the positioning system is to be a minimum of 12 inches.

3.0 WORK PLAN. Submit to the Engineer an IC Work Plan at the Preconstruction Conference and at least 2 weeks prior to the beginning construction. Describe in the work plan the following:

1. Compaction equipment to be used including:

- Vendor(s)
- Roller model(s),
- Roller dimensions and weights,
- Description of IC measurement system,
- GPS capabilities,
- Documentation system,
- Temperature measurement system, and
- Software.

2. Roller data collection methods including sampling rates and intervals and data file types.

3. Transfer of data to the Engineer including method, timing, and personnel responsible. Data transfer shall be provided by a real time cloud data collecting and distribution system (ex. Visionlink). The Contractor will provide the Cabinet with any vendor specific software, user id, passwords, etc. needed to access the data through this service, cost of this access is incidental to the IC bid item.

4. Training plan and schedule for roller operators, project foreman, project surveyors, and Cabinet personnel; including both classroom and field training. Training should be conducted at least 1 week before beginning IC

construction. The training is to be performed by a qualified representative(s) from the IC Roller manufacture(s) to be used on the project. This training shall include how to access and use the data from the cloud data source.

4.0 CONSTRUCTION. Do not begin work until the Engineer has approved the IC submittals and the IC equipment.

Follow requirements established in Section 400 for production and placement, materials, equipment, acceptance plans and adjustments except as noted or modified in this Specification. Provide the Engineer at least one day's notice prior to beginning construction or prior to resuming production if operations have been temporarily suspended. Ensure paving equipment complies with all requirements specified in Section 400. The IC roller temperatures will be evaluated by the Department with the data from a Paver Mounted Infrared Temperature Gauge.

A. Pre-Construction Test Section(s) Requirements

1. Prior to the start of production, ensure the proper setup of the GPS, IC roller(s) and the rover(s) by conducting joint GPS correlation and verification testing between the Contractor, GPS representative and IC roller manufacturer using the same datum.

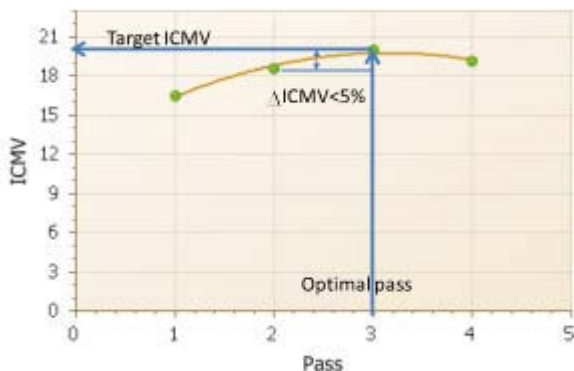
1. Ensure GPS correlation and verification testing includes the following minimum processes:
 - a. Establish the GPS system to be used either one with a base station or one with mobile receivers only. Ensure all components in the system are set to the correct coordinate system; then,
 - b. Verify that the roller and rover are working properly and that there is a connection with the base station; then,
 - c. Record the coordinates of the two edges where the front drum of the roller is in contact with the ground from the on-board, color-coded display; then,
 - d. Mark the locations of the roller drum edges and move the roller, and place the mobile receiver at each mark and record the readings; then,
2. Compare coordinates between the roller and rover receivers. If the coordinates are within 12.0 in. of each other, the comparison is acceptable. If the coordinates are not within 12.0 in., diagnose and perform necessary corrections and repeat the above steps until verification is acceptable.
3. Do not begin work until acceptable GPS correlation and verification has been obtained.
4. The Contractor and the Department should conduct random GPS verification testing during production to ensure data locations are accurate. The recommended rate is once per day with a requirement of at least once per week.
5. All acceptance testing shall be as outlined in Standard Specifications section 400.

B. Construction Test Section(s) Requirements

Construct test section(s) at location(s) agreed on by the Contractor and the Engineer within the project limits. The test section is required to determine a compaction curve of the asphalt mixtures in relationship to number of roller passes and to the stiffness of mixture while meeting the Department in-place compaction requirements. All rollers and the respective number of passes for each is to be determined via control strip each time a material change, equipment change or when the Engineer deems necessary.

Conduct test section(s) on every lift and every asphalt mixture. Ensure test section quantities of 500 to 1,000 tons of mainline mixtures. Operate IC rollers in the low to medium amplitude range and at the same settings (speed, frequency) throughout the section while minimizing overlapping of the roller, **the settings are to be used throughout the project with no changes.** After each roller pass, the qualified technician from the contractor observed by the Department will use a nondestructive nuclear gauge that has been calibrated to the mixture to estimate the density of the asphalt at 10 locations uniformly spaced throughout the test section within the width of a single roller pass. The density readings and the number

of roller passes needed to achieve the specified compaction will be recorded. The estimated target density will be the peak of the average of the nondestructive readings within the desired compaction temperature range for the mixture. The IC roller data in conjunction with the Veda software will create an IC compaction curve for the mixture. The target IC-MV is the point when the increase in the IC-MV of the material between passes is less than 5 percent on the compaction curve. The IC compaction curve is defined as the relationship between the IC-MV and the roller passes. A compaction curve example is as follows:



Subsequent to the determination of the target IC-MV, compact an adjoining > 250 < 500 tons section using same roller settings and the number of estimated roller passes and allow the Department to verify the compaction with the same calibrated nondestructive nuclear gauge following the final roller pass. **The Department will obtain cores at 10 locations (No cores for calibration are to be taken in the surface layer, use non-destructive density results only!!)** uniformly spaced throughout the test section within the width of the single roller. Obtain GPS measurement of the core locations with a GPS rover. Use the Veda software to perform least square linear regression between the core data and IC-MV in order to correlate the production IC-MV values to the Department specified in-place air voids. A sample linear regression curve example is as follows.



C. Construction Requirements

Use the IC roller on all lifts and types of asphalt within the limits of the project.

Ensure the optimal number of roller passes determined from the test sections has been applied to a minimum coverage of 80% of the individual IC Construction area. Ensure a minimum of 75% of the individual IC Construction area meets the target IC-MV values determined from the test sections.

Do not continue paving operations if IC Construction areas not meeting the IC criteria are produced until they have been investigated by the Department. Obtain the Engineer’s approval to resume paving operations. Non-IC rollers are allowed to be used as the third roller on the project; one of the breakdown or the finish rollers is to be equipped with IC technology.

IC Construction areas are defined as subsections of the project being worked continuously by the Contractor. The magnitude of the IC Construction areas may vary with production but must be at least 750 tons per mixture for evaluation. Partial IC Construction areas of < 750 tons will be included in the previous area evaluation. IC Construction areas may extend over multiple days depending on the operations.

The IC Construction Operations Criteria does not affect the Department’s acceptance processes for the materials or construction operations

5.0 MEASUREMENT. The Department will measure the total tons of asphalt mixtures compacted using the IC roller(s). Compaction is to be performed by a minimum of one (1) IC roller for a two (2) roller operation and a minimum of two (2) IC rollers when three (3) or more rollers are used for compaction. Material compacted by rollers not equipped with properly functioning IC equipment will not be accepted for payment of the bid item asphalt mixtures IC rolled. Use of non-IC rollers can be accepted on small areas due to equipment malfunctions at the written approval of the Engineer. Paving operations should be suspended for equipment malfunctions that will extend over three days of operation.

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

1. Payment is full compensation for all work associated with providing IC equipped rollers, transmission of electronic data files, two copies of IC roller manufacturer software, and training.
2. Delays due to GPS satellite reception of signals to operate the IC equipment or IC roller breakdowns will not be considered justification for contract modifications or contract extensions.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24781EC	Intelligent Compaction for Asphalt	TON

SPECIAL NOTE FOR PAVER MOUNTED TEMPERATURE PROFILES

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction current edition.

1.0 DESCRIPTION. Provide a paver mounted infrared temperature equipment to continually monitor the temperature of the asphalt mat immediately behind all paver(s) during the placement operations for all driving lanes (including ramps for Interstates and Parkways) within the project limits. Provide thermal profiles that include material temperature and measurement locations.

2.0 MATERIALS AND EQUIPMENT. In addition to the equipment specified in Subsection 403.02 Utilize a thermal equipment supplier that can provide a qualified representative for on-site technical assistance during the initial setup, pre-construction verification, and data management and processing as needed during the Project to maintain equipment within specifications and requirements.

Provide operator settings, user manuals, required viewing/export software for analysis. Ensure the temperature equipment will meet the following:

(A) A device with one or more infrared sensors that is capable of measuring in at least 1 foot intervals across the paving width, with a minimum width of 12 feet, or extending to the recording limits of the equipment, whichever is greater. A **Maximum of two (2)** brackets are allowed in the influence area under the sensors. A temperature profile must be made on at least 1 foot intervals longitudinally down the road:

(B) Infrared sensor(s):

(1) Measuring from 32°F to 400°F with an accuracy of $\pm 2.0\%$ of the sensor reading.

(C) Ability to measure the following:

(1) The placement distance using a Global Positioning System (GPS) or a Distance Measuring Instrument (DMI) and a Global Positioning System (GPS).

(2) Stationing

(D) GPS: Accuracy ± 4 feet in the X and Y Direction

(E) Latest version of software to collect, display, retain and analyze the mat temperature readings during placement. The software must have the ability to create and analyze:

(1) Full collected width of the thermal profiles,

(2) Paver speed and

(3) Paver stops and duration for the entire Project.

(F) Ability to export data automatically to a remote data server ("the cloud").

At the preconstruction meeting, provide the Department with rights to allow for web access to the data file location.

This web-based software must also provide the Department with the ability to download the raw files and software and to convert them into the correct format.

(G) The thermal profile data files must provide the following data in a neat easy to read table format.

(1) Project information including Road Name and Number, PCN, Beginning and Ending MPs.

(2) IR Bar Manufacturer and Model number

(3) Number of Temperature Sensors (N)

(4) Spacing between sensors and height of sensors above the asphalt mat

(5) Total number of individual records taken each day (DATA BLOCK)

(a) Date and Time reading taken

(b) Latitude and Longitude

(c) Distance paver has moved from last test location

(d) Direction and speed of the paver

(e) Surface temperature of each of the sensors

3.0 CONSTRUCTION. Provide the Engineer with all required documentation at the pre-construction conference.

(A) Install and operate equipment in accordance with the manufacturer's specifications.

(B) Verify that the temperature sensors are within $\pm 2.0\%$ using an independent temperature device on a material of known temperature. Collect and compare the GPS coordinates from the equipment with an independent measuring device.

(1) Ensure the independent survey grade GPS measurement device is calibrated to the correct coordinate system (using a control point), prior to using these coordinates to validate the equipment GPS.

(2) The comparison is considered acceptable if the coordinates are within 4 feet of each other in the X and Y direction.

(C) Collect thermal profiles on all Driving Lanes during the paving operation and transfer the data to the "cloud" network or if automatic data transmission is not available, transfer the data to the Engineer at the end of daily paving.

(D) Contact the Department immediately when System Failure occurs. Daily Percent Coverage will be considered zero when the repairs are not completed within two (2) working days of System Failure. The start of this two (2) working day period begins the next working day after System Failure.

(E) Evaluate thermal profile segments, every 150 feet, and summarize the segregation of temperature results. Results are to be labeled as Minimal 0°-25°F, Moderate 25.1°-50°F and Severe >50°. Severe readings over 3 consecutive segments or over 4 or more segments in a day warrant investigation on the cause of the differential temperature distribution.

4.0 MEASUREMENT. The Department will measure the total area of the driving lanes mapped by the infrared scanners. Full payment will be provided for all driving lanes with greater than 85% coverage. Partial payment will be made for all areas covered from 50% coverage to 85% coverage at the following rate Coverage area percentage X Total bid amount. An area with less than 50% coverage will not be measured for payment.

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

1. Payment is full compensation for all work associated with providing all required equipment, training, and documentation.
2. Delays due to GPS satellite reception of signals or equipment breakdowns will not be considered justification for contract modifications or contract extensions.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24891EC	PAVE MOUNT INFRARED TEMP EQUIPMENT	SQFT

Jeff Wolfe - Director
 Phone (502) 564-3020
 FAX (502) 564-7759

DIVISION OF TRAFFIC OPERATIONS

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

Item Number: 11-8001.00

County: 26

Description: Traffic signal at US 421 and new memorial drive.

Cabinets	Master code	Description of Item
1	T-01-0020	Base Mounted 332 Cabinet
1	T-01-0100	170 Controller
2	T-01-0510	Isolator, Model 242 (for ped detector and railroad)
4	T-01-0600	Loop Detector, Model 222
10	T-01-0700	Load Switches

Signals	Master code	Description of Item
8	T-02-0009	Siemens 3 Section Signal
8	T-02-0032	Siemen 3 section backplate
2	T-02-0033	Siemen 4 section 12" signal (poly)
2	T-02-0043	Siemen 4-sec. straight signal backplate
2	T-02-0300	LED Module 12" red arrow
4	T-02-0310	LED Module 12" yellow arrow
2	T-02-0320	LED Module 12" green arrow
8	T-02-0330	LED Module 12" red ball
8	T-02-0340	LED Module 12" yellow ball
8	T-02-0350	LED Module 12" green ball
8	T-02-0365	LED Countdown Pedestrian Module

Special items	Master code	Description of Item
1	T-02-0504	Router (this includes power supply/antenna/cabling)
4	T-02-0650	Pedstl.top mntg.bkt One-way
4	T-02-0670	Pedestal
8	T-06-0710	Ped Detector Pole Mount FSA Box
8	T-06-0730	Ped Button w/o Plunger

Poles	Master code	Description of Item
1	T-04-0010	Steel Strain Pole 28 foot
3	T-04-0020	Steel Strain Pole 30 foot

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

11/7/2017

SPECIAL NOTE FOR RUBBERIZED PAVEMENT SYSTEM

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's *Standard Specifications for Road and Bridge Construction*, current edition.

1.0 DESCRIPTION. Construct an impact absorbing rubberized pavement layer system, designed specifically as a running/walking path surface, on top of a previously constructed asphalt pavement. Provide at the location(s) indicated in the project plans.

2.0 MATERIALS. Provide a rubberized pavement system as a walking/running path surface layer. The system may include a base, intermediate, and surface course as well as any necessary primer coats to ensure suitable adhesion to underlying surface. Use a SportMaster or RubberWay, or an approved equal. Provide a pavement color as approved by the Engineer.

Materials for the rubberized pavement system will be accepted by certification.

3.0 CONSTRUCTION. Provide the Engineer with all required documentation at the pre-construction conference for the selected rubberized system. This documentation shall include material data sheets, application instructions, and any other information pertinent to the approval of the system. Do not begin construction of the rubberized pavement until the Engineer has approved the system. Prepare the surface per manufacturer's recommendations and follow all manufacturer's recommendations for the installation of the approved system.

4.0 MEASUREMENT. The Department will measure the total area of rubberized pavement system in square yards. The Department will not measure surface preparation, separate courses, or coatings and will consider them incidental to the entire rubberized system. The depth specified in the pay item is nominal. At a minimum, use the manufacturer's recommendation for the depth of each course in order to achieve a low impact surface.

5.0 PAYMENT. The Department will consider the unit bid price per SQYD to include all labor, materials, and equipment necessary to complete the work on the rubberized system. The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24966EC	RUBBER PAVEMENT 0.5 IN	SQYD

SPECIAL NOTE FOR PIPELINE INSPECTION

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

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

2.1 INSPECTION FOR DEFECTS AND DISTRESSES

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

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

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

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

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

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

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

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

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

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

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

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

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

3.6 AASHTO Nominal Diameters and Maximum Deflection Limits.

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

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

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

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

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

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

4.2 Record and submit all data.

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

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

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

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

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

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

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

SPECIAL NOTE

For Tree Removal

**Clay County
RECONSTRUCT KY-2432
Item No. 11-8001**

NO CLEARING OF TREES 5 INCHES OR GREATER (DIAMETER BREAST
HEIGHT) FROM APRIL 1 THOUGH OCTOBER 14.

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

Special Note for Bridge Demolition, Renovation and Asbestos Abatement

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

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



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

Memorandum

To: Dean Croft
CC: Tony Vinegar
From: O'Dail Lawson
Environmental Scientist II
Division of Environmental Analysis
Date: 12/17/2014
Re: Asbestos Inspection Report for Clay 11-8001

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

Project and Structure Information

Project # Clay 11-8001

Bridge # 026B00098N

Location: Littleton/Beech Creek Road over Hart Branch

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

Inspection Date: December 8th, 2014

Results

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



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

332 West Broadway, Suite 613
Louisville, Kentucky 40202

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

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N # 2412115 Address: Item # 11 - 8001 026 B00098N
 Client Name: KYTC
 Sampled By: O'Dail Lawson

Number	Color	Layered	Fibrous	% FIBROUS ASBESTOS				% NON-ASBESTOS FIBERS			
				Chrysotile	Amosite	crocidolite	Others	Cellulose	Fiberglass	Syn. Fiber	Other/Mat.
# 98 - 1	Gray	Yes	No				None				100%
# 98 - 2	Gray	Yes	No				None				100%

Methodology : EPA Method 600/R-93-116
 Date Analyzed : 11-Dec-14
 Analyst : Winterford Mensah

Reviewed By: *Winterford Mensah*
Signature

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

Chain of Custody Record

Kentucky Transportation Cabinet

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



O'Dail Lawson o'dail.lawson@ky.gov
KYTC
 Address: 200 Mero Street Frankfort KY
 Phone: 502-782-5020 Fax: 502-564-5655
 PO#:
 Project or Subject Reference: **026300098N 11-8001**
 Client Information **KY TRANSPORTATION CABINET**
 Results Code: ND = None Detected
 FTD = Filter Tampering or Damaged
 N/A = Not Applicable
 Samplers (signature): *[Signature]*

Sample ID	Sample Description	Collected		Analysis Requested	Matrix	Color	Cont. Type	Preservative
		Date	Time					
98-1	Ditch Concrete	12-8-14	11:46	Asbestos bulk	Concrete	Grey		N/A
98-2	Abutment Concrete							

Relinquished By: _____ Date/Time: _____
 Received By: *[Signature]* Date/Time: **12/09/14**
 Relinquished By: _____ Date/Time: _____
 Received at Lab By: _____ Date/Time: _____

The EI Group, Inc.

This certifies that

Tilmon O'Dail Lawson

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

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

Asbestos Inspector Refresher (4-Hour) Training Course

7214080013
Certificate Number

7910
Social Security Number

August 15, 2014
Course Dates

August 15, 2014
Exam Date

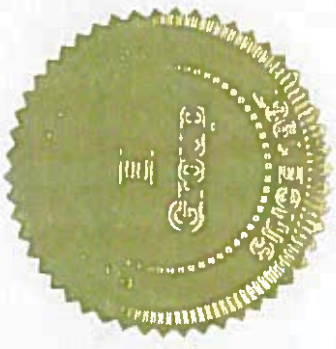
August 15, 2015
Expiration Date

Louisville, KY
Course Location

Barry A. Maxwell
Barry Maxwell, Training Manager

Kerri Boddy
Kerri Boddy, Principal Instructor

Kerri Boddy
Kerri Boddy, Exam Administrator



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



TRANSPORTATION CABINET

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

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

Memorandum

To: Dean Croft
CC: Tony Vinegar
From: O'Dail Lawson
Environmental Scientist II
Division of Environmental Analysis
Date: 12/17/2014
Re: Asbestos Inspection Report for Clay 11-8001

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

Project and Structure Information

Project # Clay 11-8001

Bridge # unknown structure

Location: Coal Hollow Road (CR 1527) over Hart Branch

Description: The concrete sample collected was negative for asbestos. No abatement necessary.

Inspection Date: December 8th, 2014

Results

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



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

332 West Broadway, Suite 613
Louisville, Kentucky 40202

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

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N # 2412117 Address: Item # 11-8001 Unknown Structure
 Client Name: KYTC
 Sampled By: O'Dail Lawson

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

Methodology : EPA Method 600/R-93-116
 Date Analyzed : 11-Dec-14
 Analyst : Winterford Mensah

Reviewed By: 
Signature

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



Chain of Custody Record
Kentucky Transportation Cabinet
 200 Mero Street, 5th Floor West
 Frankfort, Kentucky 40622
 (502) 564-7250 fax (502) 564-5655

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

Client Information KY TRANSPORTATION CABINET
 Results Code:
 ND = None Detected
 FTD = Filter Tampering or Damaged
 N/A = Not Applicable

Samplers (signature):

(Signature)

Project or Subject Reference: 11-8001 unknown structure

Sample ID	Sample Description	Collected		Analysis Requested	Matrix	Color	Cont. Type	Preservative
		Date	Time					
U-1	Wing Wall	11-08-14	12:00	Asbestos bulk	Concrete	Grey		N/A

Relinquished By: _____ Date/Time: _____
 Received By: *(Signature)* Date/Time: 12/09/14
 Relinquished By: _____ Date/Time: _____
 Received at Lab By: _____ Date/Time: _____

The EI Group, Inc.

This certifies that

Tilmon O'Dail Lawson

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

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

Asbestos Inspector Refresher (4-Hour) Training Course

7214080013
Certificate Number

7910
Social Security Number

August 15, 2014
Course Dates

August 15, 2014
Exam Date

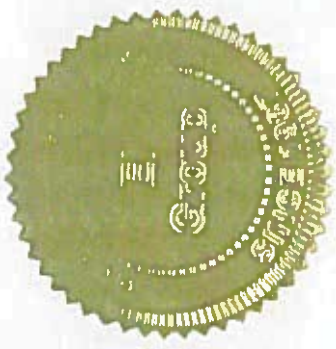
August 15, 2015
Expiration Date

Louisville, KY
Course Location

Barry A. Maxwell
Barry Maxwell, Training Manager

Kerr Boddy
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TRANSPORTATION CABINET

Frankfort, Kentucky 40622
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Steven L. Beshear
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Secretary

Memorandum

To: Dean Croft
CC: Tony Vinegar
From: O'Dail Lawson
Environmental Scientist II
Division of Environmental Analysis
Date: 12/17/2014
Re: Asbestos Inspection Report for Clay 11-8001

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

Project and Structure Information

Project # Clay 11-8001

Bridge # 026B00100N

Location: KY 2432 over Goose Creek

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

Inspection Date: December 8th, 2014

Results

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



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

332 West Broadway, Suite 613
Louisville, Kentucky 40202

(502) 495-1212

Fax: (502) 491-7111

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N# 2412114 Address: Item # 11-8001 026B00100N
 Client Name: KYTC
 Sampled By: O'Dail Lawson

Number	Color	Layered	Fibrous	% FIBROUS ASBESTOS				% NON-ASBESTOS FIBERS			
				Chrysotile	Amosite	crocidolite	Others	Cellulose	Fiberglass	Syn. Fiber	Other/Mat.
100 - 1	Gray	Yes	No				None				100%
100 - 2	Gray	Yes	No				None				100%
100-3	Black	Yes	No				None				100%
100-4	Gray	Yes	No	2%	(To Be	Point Counted)		2%			96%

Methodology : EPA Method 600/R-93-116
 Date Analyzed : 11-Dec-14
 Analyst : Winterford Mensah

Reviewed By: *Winterford Mensah*
Signature

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


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

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

Client: KY Transportation Cabinet	Project No: 2412114 B
Address: 200 Mero Street	Sample ID: # 100 - 4
Frankfort, KY	Sampled: 8-Dec-14
40601	Received: 9-Dec-14
Attention O'Dail Lawson	Analyzed: 11-Dec-14 - Point Count -

Bulk Sample Analysis

Sampled by:	O'Dail Lawson
Facility/Location:	Item # 11 - 8001 B026B00100N
Field Description:	Guard Rail Mastic
Laboratory Description:	Gray Material
Asbestos Materials:	Chrysotile = 1/400 = 0.25 % (< 1 %) Sample Is Negative
Non-asbestos Fibrous Materials & Matrix Materials:	
Cellulose	0.25 %
Binders	99.50 %
Remarks: The sample was analyzed for asbestos content following the EPA Methodology (600/R-93/116). The test relates only to the items tested. This report does not represent endorsement by NVLAP or any agency of the U.S. Government.	
Analyst: <u>Winterford Mensah</u>	Reviewed By: <u></u> <small>Signature</small>

Chain of Custody Record

Kentucky Transportation Cabinet

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



O'Dail Lawson o'dail.lawson@ky.gov KYTC 200 Metro Street Frankfort KY Phone: 502-782-5020 Fax: 502-564-5655 PO#:		Client Information KY TRANSPORTATION CABINET Results Code: ND = None Detected FTD = Filter Tampering or Damaged N/A = Not Applicable			
Project or Subject Reference 11-8001		Samplers (signature): 			
Collected Date Time 12-8-14 12:15		Analysis Requested West End Arkansas bulk			
Sample ID 100-1	Sample Description STAIRWAY Concrete	Matrix Concrete	Color Grey	Cont. Type N/A	Preservative
100-2	Curb Concrete	↓	↓	↓	↓
100-3	Joint Compound	↓	Rubber Black	↓	↓
100-4	Guard Rail Masiz	↓	Masiz Grey	↓	↓
Relinquished By:		Date/Time:		Date/Time:	
Received By:		Date/Time: 12/09/14		Date/Time:	
Relinquished By:		Date/Time:		Date/Time:	
Received at Lab By:		Date/Time:		Date/Time:	

The EI Group, Inc.

This certifies that

Tilmon O'Dail Lawson

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

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

Asbestos Inspector Refresher (4-Hour) Training Course

7214080013
Certificate Number

7910
Social Security Number

August 15, 2014
Course Date

August 15, 2014
Exam Date

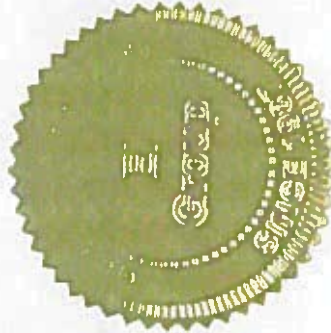
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888-372-5859

	KENTUCKY TRANSPORTATION CABINET Department of Highways DIVISION OF RIGHT OF WAY & UTILITIES RIGHT OF WAY CERTIFICATION	TC 62-226 Rev. 01/2016 Page 1 of 1
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<input checked="" type="checkbox"/>	Original	<input type="checkbox"/>	Re-Certification	RIGHT OF WAY CERTIFICATION			
ITEM #	COUNTY		PROJECT # (STATE)		PROJECT # (FEDERAL)		
11-8001.00	CLAY		FD04 026 2432 000-002		STP 6000 (112)		

PROJECT DESCRIPTION
 RECONSTRUCT KY 2432 FROM SECIND STREET IN EAST MANCHESTER NORTH TO THE LEFT FORK OF COAL HOLLOW ROAD

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

Condition # 1 (Additional Right of Way Required and Cleared)
 All necessary right of way, including control of access rights when applicable, have been acquired including legal and physical possession. Trial or appeal of cases may be pending in court but legal possession has been obtained. There may be some improvements remaining on the right-of-way, but all occupants have vacated the lands and improvements, and KYTC has physical possession and the rights to remove, salvage, or demolish all improvements and enter on all land. Just Compensation has been paid or deposited with the court. All relocations have been relocated to decent, safe, and sanitary housing or that KYTC has made available to displaced persons adequate replacement housing in accordance with the provisions of the current FHWA directive.

Condition # 2 (Additional Right of Way Required with Exception)
 The right of way has not been fully acquired, the right to occupy and to use all rights-of-way required for the proper execution of the project has been acquired. Some parcels may be pending in court and on other parcels full legal possession has not been obtained, but right of entry has been obtained, the occupants of all lands and improvements have vacated, and KYTC has physical possession and right to remove, salvage, or demolish all improvements. Just Compensation has been paid or deposited with the court for most parcels. Just Compensation for all pending parcels will be paid or deposited with the court prior to AWARD of construction contract

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

Total Number of Parcels on Project	48	EXCEPTION (S) Parcel #	ANTICIPATED DATE OF POSSESSION WITH EXPLANATION
Number of Parcels That Have Been Acquired			
Signed Deed	36		
Condemnation	12		
Signed ROE	12		

Notes/ Comments (Use Additional Sheet if necessary)
 Parcel 17 is a misc move. Waiting on check. His expected move date is expected by Nov. 24th 2017

LPA RW Project Manager		Right of Way Supervisor	
Printed Name		Printed Name	<i>Greg Combs</i>
Signature		Signature	<i>[Signature]</i>
Date		Date	11-9-2017
Right of Way Director		FHWA	
Printed Name	<i>[Signature]</i>	Printed Name	No Signature Required
Signature	<i>[Signature]</i>	Signature	Per FHWA Stewardship
Date	09NOV17	Date	Agreement

UTILITIES AND RAIL CERTIFICATION NOTE

**CLAY COUNTY
JL03 026 79964 01U
RECONSTRUCT KY2432
11-8001.00**

GENERAL PROJECT NOTE ON UTILITY PROTECTION

Exercise care when operating near overhead lines and/or digging near underground utilities. See the General Notes of the utility relocation plans for additional notes regarding the City of Manchester's relocation.

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

N/A

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

N/A

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

Jackson Energy, KU, Windstream, & House Cable are relocating their overhead lines to be clear of construction. Relocation plans will be provided, however, poles as relocated in the field will supersede respective locations shown on plans.

Delta Gas is relocating their gas lines to be clear of roadwork from the start of the project through RT STA 99+00 (Webb Street) as well as around Clay County Middle School. This work should not affect the cross-country cut. Plans will be provided. With regards to these facilities, slight deviations from the design of the City of Manchester's facilities may be necessary to ensure all underground utilities can be accommodated.

The above activities may be ongoing until April 1st, 2018. The completion date of the roadwork has been set accordingly & the Contractor should plan work with this utility involvement in mind. As such, absolutely no claims for delays due to the above listed work during this time period will be accepted.

The Department will consider submission of a bid as the Contractor's agreement to not make any claims for monetary compensation due to delays or other conditions created by the operations of the companies listed above. Working days will not be charged for those days on which work on these facilities is delayed after the above date, as provided in the current edition of the KY Standard Specifications for Road and Bridge Construction. Should a difference of opinion arise as to the rights of the Contractor and others working within the limits of, or adjacent to the project, the KYTC Resident Engineer will decide as to the respective rights of the various parties involved in order to assure the completion of the Department's

UTILITIES AND RAIL CERTIFICATION NOTE

**CLAY COUNTY
JL03 026 79964 01U
RECONSTRUCT KY2432
11-8001.00**

work in general harmony and in a satisfactory manner, and his decision shall be final and binding upon the Contractor.

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

Relocation of the City of Manchester’s water, sewer, & gas lines are to be performed as part of the road contract. At the time of the drafting of this note, attempts to obtain utility easements are still ongoing for the Clay County District Finance Corp & Memorial Hospital. Easements are expected to be obtained but work on these parcels may need to occur after the other parcels. Plans & specifications have been included as part of the contract proposal. Coordinate the relocation with Mr. Mike White.

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

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

UNDERGROUND FACILITY DAMAGE PROTECTION – BEFORE YOU DIG

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor’s responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. The contractor is instructed to contact KY 811 for the location of existing underground utilities. Contact shall be made a minimum of two (2) and no more than ten (10) business days prior to excavation.

The contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY 811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom are to be contacted through their individual Protection Notification Center. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area. Non-compliance with these directives can result in the enforcement of penalties.

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

UTILITIES AND RAIL CERTIFICATION NOTE

**CLAY COUNTY
JL03 026 79964 01U
RECONSTRUCT KY2432
11-8001.00**

facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs.

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

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

AREA UTILITIES CONTACT LIST

<u>Utility Company/Agency</u>	<u>Contact Name</u>	<u>Contact Information</u>
City of Manchester	Mike White	606-813-8480
KU	Mike Money	606-246-1262
Windstream	Rodney Armstrong	606-878-3267
Jackson Energy	Brent Bingham	606-364-9227
House Cable	Henry Garrison	606-598-2292
Delta Gas	Tom Conlee	859-744-6171x1122

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

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

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

PROTECTION OF EXISTING UTILITIES

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

PREQUALIFIED UTILITY CONTRACTORS

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

City of Manchester

- Clay Pipeline
- Akins Excavating Co., Inc.
- Grant Excavating

The bidding contractor needs to review the above list of approved subcontractors before bidding. When the list of approved subcontractors is provided, only subcontractors shown on this list will be allowed to work on that utility as a part of this contract.

When the list of approved subcontractors for the utility work is not provided in these general notes, the utility work can be completed by the prime contractor. If the prime contractor chooses to subcontract the work, the subcontractor shall be prequalified with the KYTC Division of Construction Procurement in the

work type of “Utilities” (I33). Those who would like to become prequalified may contact the Division of Construction Procurement at (502) 564-3500. Please note: it could take up to 30 calendar days for prequalification to be approved. The prequalification does not have to be approved prior to the bid, but must be approved before the subcontract will be approved by KYTC and the work can be performed.

CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

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

SUBMITTALS AND CORRESPONDENCE

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

ENGINEER

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

INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

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

NOTICE TO UTILITY OWNERS OF THE START OF WORK

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

UTILITY SHUTDOWNS

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

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

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

CUSTOMER SERVICE AND LATERAL ABANDONMENTS When temporary or permanent abandonment of customer water, gas, or sewer services or laterals are necessary during relocation of utilities included in the contract, the utility contractor shall perform these abandonments as part of the contract as incidental work. No separate payment will be made for service line and lateral abandonments. The contractor shall provide all labor, equipment and materials to accomplish the temporary or permanent abandonment in accordance with the plans, specifications and/or as directed by the engineer. Abandonment may include, but is not limited to, digging down on a water or gas main at the tap to turn off the tap valve

or corporation stop and/or capping or plugging the tap, digging down on a sewer tap at the main and plugging or capping the tap, digging down on a service line or lateral at a location shown on the plans or agreeable to the engineer and capping or plugging, or performing any other work necessary to abandon the service or lateral to satisfactorily accomplish the final utility relocation.

STATIONS AND DISTANCES

All stations and distances, when indicated for utility placement in utility relocation plans or specifications, are approximate; therefore, some minor adjustment may have to be made during construction to fit actual field conditions. Any changes in excess of 6 inches of plan location shall be reviewed and approved jointly by the KYTC Section Engineer or designated representative and utility owner engineer or designated representative. Changes in location without prior approval shall be remedied by the contractor at his own expense if the unauthorized change creates an unacceptable conflict or condition.

RESTORATION

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

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

Standard Water Bid Item Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Size Range 2 = All meter and piping sizes greater than 6 inches

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Size 2 = All live tapped main sizes greater than 8 inches

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

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

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

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

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

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

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

TECHNICAL SPECIFICATIONS

SECTION A

GENERAL INFORMATION

1. GENERAL

1.1 These technical specification include descriptions of materials, which may or may not be used on this project.

1.1.1 The Contractor shall carefully read the Special Provisions for statements concerning other specifications, which may be applicable to the Project.

1.2 Materials shall be of the types and constructed on the materials specified herein when identified on Plans, Bid Form or Measurement for Payment. Materials and accessories shall be of new and unused material and shall be installed in accordance with manufacturer's specification and/or as shown on the plans.

1.3 The Contractor shall be responsible for the safe storage and handling of all material furnished to or by him, and accepted by him, until it has been incorporated into the completed project and the project has been accepted by the Owner.

1.3.1 The Contractor shall handle all materials and equipment in such manner to avoid damage. All material and equipment whether moved by hand, skidways, hoists or other means shall be handled in such a manner to avoid dropping or bumping against other material or equipment.

1.3.2 In distributing material at the site of work, each piece shall be unloaded as near as possible to final installation point to minimize the number of times it must be handled.

2. PROTECTION OF UNDERGROUND AND SURFACE STRUCTURES AND OTHER PROPERTY

2.1 GENERAL

Temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers, and other obstruction encountered in the progress of the work shall be furnished at the Contractor's expense incidental to the project.

2.2 Obstruction by Other Utilities

2.2.1 Existing underground utilities shown on the plans are shown in approximate locations based on information furnished by others. Prior to beginning construction of proposed facilities the Contractor shall accurately locate existing underground utilities by whatever means necessary including excavation where required. The Contractor shall notify the Engineer where utilities, so located will interfere with proposed construction.

2.2.2 Where the limits of construction of the proposed work encroach upon existing utilities, the Contractor, where possible, shall provide temporary support or protection satisfactory to the owner of the utility to permit continuation of proposed construction and no additional payment authorized.

2.2.3 Where existing utilities are encountered which prohibit construction of proposed facilities unless relocated the Contractor shall so notify the Engineer unless the plans provide for their relocation. Relocation shall be

accomplished in a manner acceptable to the owner of the utility, and shall be furnished at the Contractor's expense incidental to the project.

2.3 Property Protection

- 2.3.1 Extreme care shall be taken to protect trees, fences, poles, crops and all other property from damage unless their removal is authorized by the Engineer. Any damaged property shall be restored to as good or better than original condition and shall meet with the approval of the Engineer and Owner.
- 2.3.2 The Contractor has the right to fully utilize the easement unless specifically stated otherwise on the plans or by the Engineer. If any irreplaceable trees, fences, poles or crops, such as tobacco, corn, soy beans and such (excluding pasture land), occur on the easement the Contractor shall obtain the engineer's and Owner's approval prior to removing or otherwise causing damage to any of these items.
- 2.3.3 Beyond the limits of the easement the contractor shall be responsible for any damage caused by his operation and/or his personnel.

3. INCIDENTAL ITEMS OF CONSTRUCTION

3.1 Barricades, Guards, and Safety Provisions

- 3.1.1 To protect the public from injury and to avoid property damage, adequate barricades, construction signs, warning lights and guards shall be placed and maintained by the Contractor during the progress of construction work until it is safe for the public to use the construction site.
- 3.1.2 The Contractor shall provide and maintain all safety facilities and devices required by the Occupational Safety and Health Act (OSHA). The Engineer is not responsible for safety provisions furnished or used by the Contractor nor will the Engineer advise or direct safety operation of the Contractor.

3.2 Traffic and Utility Control

- 3.2.1 All excavations shall be conducted in a manner to cause the least interruption to traffic. The Contractor shall provide suitable bridges at streets and driveways where traffic must cross excavated areas.
- 3.2.2 Driveways and other private and public access routes shall not be kept blocked or closed by the Contractor for more than a reasonable period of time without prior written approval from the property owner or controlling authority.
- 3.2.3 Existing fire hydrants, valve pit covers, valve boxes, meter boxes, curb-stop boxes, fire or police call boxes or other utility controls shall be kept unobstructed and accessible during the construction period.

3.3 Maintenance of Utility Service and Flow of Drains

- 3.3.1 Adequate provisions shall be made for the maintenance of flow in sewers (storm or sanitary), drains, water lines and gas lines and electrical lines encountered during construction.
- 3.3.2 No valve, switch or other control device of any utility system within the construction, area shall be operated by the Contractor without approval of the utility except in cases of an emergency. All utility customers which will be affected by the operation of any utility valve or control device shall be

notified by the Contractor in sufficient time for each customer to make arrangements for the period of no service. Each customer shall be advised as to the time service will be off and probable time when it will be resumed.

3.4 Fencing

- 3.4.1 When the pipe line is being constructed through fields where livestock is being held the contractor shall provide, either temporary fencing or stationing of personnel, adequate protection to livestock from machinery, and open trenches. The Contractor shall take all precautions necessary to insure that all animals are not isolated.
- 3.4.2 Where pipe line crosses fences in good condition and the work area is easily accessible through gates, the Contractor shall excavate or tunnel beneath the fences.
- 3.4.3 When it is necessary to cut existing fences, new end posts shall be installed one each side of the construction easement and old fence thoroughly stapled to these new posts before cutting fence.

After pipe is installed at this point and backfill is completed, a new fence of galvanized wire (No. 9 guage) shall be stretched between the new posts and thoroughly stapled to existing post and any new intermediate posts necessary to provide a good fence. Replacement of fences shall be on an in kind basis and shall be considered incidental to installation of the pipeline.

4. SUMMARY

4.1 The Contractor shall furnish at the site of Work, all materials, labor and equipment necessary to complete the Work in accordance with the terms of the Contract and as required hereunder. He shall make the required excavation for installing the water lines and all other appurtenant structures: do all ditching, diking, pumping, bailing and draining or otherwise lowering and disposing of water encountered in the excavation necessary for rendering the foundation firm, dry and adequate for installing the water lines and appurtenances; do, as required, all sheeting, shoring, bracing, coffer damming and supporting; provide all lighting, barricades, signs, flagmen and watchmen: make all provisions necessary to maintain and protect, buildings, paved surfaces, fences, trees, shrubs, piles, water pipes, gas pipes, sewers, water courses, surface drains, railroads, railways and other structures in, on, across or adjacent to the Work and repair all damage done to them where and as required; provide all temporary bridges, detours or other means of maintaining travel, both vehicular and pedestrian; construct all concrete, brick and like work; lay all water connections; set in place all iron and other metal work; backfill all trenches; restore walks, grass pots, shrubs, trees, flowers, fences, paved surface, etc. damaged or disturbed; clear away all rubbish and surplus materials; furnish all materials, tools, implements, machines, tracks, pumps, forms, supplies and labor required to build and put in complete and acceptable working order the water lines and appurtenances covered by the Contract Documents and described by the plans and specifications.

TECHNICAL SPECIFICATIONS

SECTION B

RELATED PIPING MATERIALS AND EQUIPMENT

1. GENERAL DESCRIPTION

1.1 All materials necessary for the completion of the work shall be furnished by the Contractor, as approved by the engineer to meet the requirements of the Plans and Specifications. Any materials found to be defective or not meeting the Specifications shall be rejected and replaced by approved materials at no additional cost to the Owner.

1.2 Concrete Materials

Materials used in all concrete construction shall be governed by the Concrete Section of these Technical Specifications.

2. BACKFILL MATERIALS

2.1 General

The following materials shall be used to backfill any trenches so designated and in any situation shown on the Plans where such materials are specified.

2.2 Sand or Sandy Materials

Sandy backfill in trenches for water lines, property service connection, and structures within the limits of existing or proposed paved surfaces and sand or sandy materials for other miscellaneous construction purposes not specified herein shall consist of natural, crushed, or conglomerate sand containing not more than twenty (20) percent clay.

2.3 Coarse Aggregates

Coarse aggregates shall conform to Kentucky Transportation Cabinet Standard Specifications (Latest Edition) Section 805, and shall be of the size and type as indicated on the Plans or Specifications.

2.4 Selected Excavated Materials

Backfill in trenches for water lines, property service connections, and structures outside the limits of existing or proposed paved surfaces, and in other specified locations shall be made with selected excavated materials taken from the trench excavation. The specified makeup of this material shall be governed by the Plans or Section e-1.17 of these Technical Specifications.

3. PAVING MATERIALS

3.1 General

All materials used for pavement replacement shall conform to requirements and regulations of the local governments and to Sections 403 and 805 of the Kentucky Transportation Cabinet Standard Specifications (Latest Edition) except for basis of payment.

3.2 Concrete Surface

Materials used in the construction of the concrete surface shall conform to Section 501.02 of the Kentucky Transportation Cabinet Standard Specifications (Latest Edition).

3.3 Bituminous Concrete Surface

Materials used in construction of the bituminous concrete surface shall conform to Section 403.02 of the Kentucky Transportation Cabinet Standard Specifications (Latest Edition).

3.4 Bituminous Concrete Base

Materials used in construction of the bituminous concrete base shall conform to Section 403.02 of the Kentucky Transportation Cabinet Standard Specifications (Latest Edition).

3.5 Bituminous Tack Coat

The material for the bituminous tack coat shall be type SS-1h and shall conform to Section 806 of the Kentucky Transportation Cabinet Standard Specifications (Latest Edition).

3.6 DGA Base

Materials used for the compacted dense graded aggregate base shall conform to Section 302.02 of the Kentucky Transportation Cabinet Standard Specifications (Latest Edition).

TECHNICAL SPECIFICATIONS

SECTION C

PIPE MATERIALS

1. GENERAL

1.1 These Specifications describe several types of pipe, which may or may not apply to the current project. All types listed herein will be acceptable alternates if no indication is otherwise given either on the Plans or in other sections of these Specifications.

1.2 Selected pipe materials will be identified either on the Plans, or Bid Form, in Special provision, or in Measurement for Payment. The Contractor shall thoroughly familiarize himself with each of the items identified above and base his bid on the pipe material given therein.

1.3 Handling of Pipe and Accessories

1.3.1 Pipe and accessories shall be unloaded at the point of delivery, hauled to, and distributed at the site of the Project by Contractor in such a manner to avoid damage to the materials. Whether moved by hand, skidways, or hoists, materials shall not be dropped or bumped against pipe or accessories already on the ground or against any other object.

1.3.2 In distributing material at the construction site, each piece shall be unloaded as near the installation point as possible.

1.3.3 Pipe shall be handled in such a manner as to avoid damage to the ends. When such damaged pipe cannot be repaired to the Engineer's satisfaction, it shall be replaced at the Contractor's expense. The interior of all pipe and accessories shall be kept free from dirt and foreign matter at all times. The interior of all pipe and accessories shall be checked for dirt and debris and, if necessary, thoroughly cleaned before use in the Project.

2. CAST IRON PIPE AND FITTINGS

3.1 Scope

This article covers the design, manufacture and testing of cast iron pipe centrifugally cast in metal molds and cast iron fittings for pipe sizes three (3") inch through forty-eight (48") inch.

3.2 Specific Requirements

Cast iron pipe shall be centrifugally cast in metal molds and shall be furnished cement lined unless otherwise noted on the Plans or in other sections of the Specification. Cast iron pipe shall be furnished with rubber-gasket push-on joints except as may otherwise be noted on the Plans or in difficult working areas and approval of the Engineer.

3.2.1 Thickness design of cast iron shall conform in all aspects to the requirements of ANSI-AWWA C101 latest revision.

3.2.2 Manufacture and testing of cast iron pipe centrifugally cast in metal molds shall comply with the requirements of the National Standard Institute and American Water Works Association designation A 21.6/AWWA C106 latest revisions.

3.2.3 Cement mortar lining shall conform to the requirements of ANSI/AWWA C104/A 21.4, latest revision for Cement-Mortar Lining for Ductile Iron Pipe and Gray Iron Pipe and Fittings for Water.

- 3.2.4 Fittings and joints for cast iron pipe shall conform to the latest revisions of ANSI/AWWA C110 "Cast Iron and Ductile Iron Fittings, Three (3') Inches through Forty-Eight (48') Inches, for Water and Other Liquids", ANSI/AWWA C111/A 21.11 "Rubber-Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings", and ANSI/AWWA C115 21.15 "Flanged Cast Iron and Ductile Iron Pipe with Threaded Flanges".

4. DUCTILE IRON PIPE AND FITTINGS

4.1 Scope

This article covers the design manufacture, and testing of ductile iron centrifugally cast in metal molds and ductile iron fittings.

4.2 Specific Requirements

Ductile iron pipe shall be centrifugally cast in metal molds and shall be furnished cement lined unless otherwise noted on the Plans or in other sections of these Specifications. Ductile iron pipe shall be furnished with rubber gasket push-on joints except as may otherwise be noted on the Plans or in difficult working areas with approval of the Engineer.

4.2.1 Thickness design of ductile iron shall conform in all aspects to the requirements of ANSI/AWWA C150/A 21/50 latest revision.

4.2.2 Manufacture and testing of ductile iron pipe shall conform in all respects to the requirements of the latest revisions of ANSI/AWWA C151/A 21.51.

4.2.3 Cement Mortar Lining – See ART. 3.2.3 above.

4.2.4 Fittings and Joints – See ART. 3.2.4 above.

5. PVC (POLYVINYL CHLORIDE) PRESSURE PIPE

5.1 Scope

This article covers the design, manufacture and testing of PVC **1120** manufactured of Class 12454-A or Class 12454-B resin material with a hydrostatic-design-basis (HDB) rating of 4,000 psi at 73.4 degree F (23 degree

5.2 Specific Requirements

PVC pressure pipe shall be furnished, constructed of materials and to the specifications of this section. The types of PVC pipe permitted for use on the Project will be as noted on the Plans, Bid Documents or other sections of these Specifications. The selected pipe will be designated either as PVC (ASTM) or PVC (AWWA) followed by an appropriate pressure rating. The Contractor shall thoroughly review the Plans and other sections of these Specifications for the type of PVC pipe selected for the Project. All PVC pipe shall be NSF approved.

5.2.1 PVC (ASTM) pipe shall be furnished and installed when designated on the Plans or in the Bid Documents. When selected, by the Engineer, for use on the Project PVC (ASTM) pipe shall be designated, manufactured and tested to conform with the latest revision of the American Society for Testing and Materials designated ANSI/ASTM D-2241.

5.2.2 PVC (AWWA) pipe shall be furnished and installed when designated on the Plans or in the Bid Documents. When selected, by the Engineer, for use on the Project, PVC (AWWA) pipe shall be designated, manufactured, and tested in

conformance to the latest revision of the American Waterworks Association designation AWWA C900

- 5.2.3 PVC pipe joints shall be rubber gasket push-on joints either constructed integrally with the pipe or as a separate coupling constructed on the same material and to the same pressure Specifications as the pipe.
- 5.2.4 PVC (ASTM) pipe shall be furnished as SDR 26, 21, and 17 for Class 160-psi, 200-psi and 250-psi respectively.
- 5.2.5 PVC (AWWA) pipe shall be furnished as SDR 25, 18, and 14 for Class 100-psi, 150-psi and 200-psi respectively.
- 5.2.6 PVC (AWWA) pipe shall be furnished with outside dimensions (O.D.) equal to that for ductile iron and cast iron pipe.
- 5.2.7 Fittings for PVC (ASTM) pipe may be either PVC, cast or ductile iron. Those for PVC (AWWA) pipe shall be ductile iron.

6. POLYETHYLENE PIPE AND FITTINGS

6.1 Scope

This section covers the design, manufacture and testing of polyethylene high density pressure pipe manufactured of grade P34 resin material with a hydrostatic – design basis (HDB) rating of 1,600-psi at 73.4 degree F (23 degrees C)

6.2 Specific Requirements

The Contractor shall furnish and install high-density polyethylene pipe meeting these Specifications at the locations indicated on the Plans and in other sections of these Specifications.

- 6.2.1 High density polyethylene pipe shall be manufactured and tested in conformance to the requirements of the latest revision of the American Society for Testing and Materials designation ASTM D-3350 “Polyethylene Plastic Pie and Fittings Materials”.
- 6.2.2 High density Polyethylene pipe shall have a grade designation of PE 3406 and a cell classification designation of PE 355434C.
- 6.2.3 High-density polyethylene pipe shall be joined by means of butt fusion.
- 6.2.4 Fittings for high-density polyethylene pipe shall be manufactured of the same materials as the pipe. Unless otherwise indicated, all fittings shall be joined to the pipe by butt fusion techniques.

7. BALL AND SOCKET RIVER CROSSING PIPE

7.1 Scope

This article covers the design, manufacture, and testing of Ductile Iron Ball and Socket River Crossing pipe.

7.2 Specific Requirements

Joints for ductile iron river crossing pipe shall be flexible, ball and socket type, and boltless joints with rubber gaskets conforming to the ANSI Specification for “Rubber-Gasket joints for Ductile Iron Pressure Pipe and Fittings”, A 21.11 (AWWAC11), Latest Revision.

TECHNICAL SPECIFICATIONS

SECTION D

PIPING APPURTENANCES

1. CRADLES AND ENCASEMENT

1.1 General

The cradle or encasement, as required to support the pipe, shall be of crushed stone or concrete and shall be installed as specified in the Pipe Work Section of these Specifications, and as shown on the Plans.

1.2 Crushed Stone Cradle

In all cases where the bedding is not specified the pipe is to be laid in crushed stone cradle. The crushed stone to be used shall be Kentucky Highway No. 9 or No. 78 Crushed Stone, as specified by the Kentucky Transportation Cabinet Standard Specifications (Latest Revision).

1.3 Concrete Cradle, Encasement, or Cap

Where a concrete cradle, encasement, or cap is required, concrete shall conform to the Concrete Section of these Technical Specifications. Dimensions shall be as shown on the plans.

1.4 Concrete Thrust Blocks and Anchor Blocks

Where concrete thrust blocks and anchor blocks are required (i.e. at all pipe bends and fittings), concrete as specified in the Concrete Section of these Technical Specifications shall be used.

1.5 Special Concrete Structures and Vaults

Cast in place concrete structures shall be constructed of concrete conforming to the Concrete Section of these Technical Specifications to the dimensions and grades as shown on the Plans.

1.6 Valves and Related Appurtenances

1.6.1 General

All valves and related appurtenances shall be installed as shown on the Plans and specified in these Technical Specifications. Material Specifications shall be as described below. Any materials found defective, not meeting the specifications, or improperly installed, shall be rejected and so marked and shall be replaced by materials approved by the Engineer, at no additional cost to the Owner.

1.7 Gate Valves

Gate valves shall be non-rising stem, iron body, bronze mounted, double disc, parallel seat type with o-ring stem seals. Unless otherwise specified the valves shall be suitable for 0-150 PSI operating pressures. Valves which are to be buried for outside use shall be furnished with a 2 inch operating nut and shall have mechanical joint ends. Other valves shall have either flanged or mechanical joint ends and shall be operated by hand wheel or chain-wheel operator as shown on the Plans. All valves shall conform to the AWWA Standard C 500, Latest Revision, relative to materials, manufacture, dimensions, inspections, testing, and markings.

1.8 Gate Valves Boxes

Each buried gate valve shall be provided with a 5 ¼" shaft, slide-type, two-piece cast iron valve box. The box shall be of the length as necessary to conform to the depth of the valve. Any extension sections necessary shall be provided with the valve box. Unless shown otherwise on the Plans, the valve box cover shall be marked "Water".

1.9 Check Valves

Check valves shall be iron body, bronze mounted. They shall be outside weight and lever type (unless specified otherwise by the Engineer or indicated as such on the Plans) with bronze seat, hinge and guide busting. Unless otherwise indicated, check valves for interior use shall be flanged and those for exterior use shall be mechanical joint.

1.10 Automatic Air Release Valves

Air release valves shall be of the type, which will automatically release air which accumulates in the pipe system. The body and cover shall be case iron and the float shall be stainless steel. Unless otherwise indicated the valves shall be suitable for use in lines having an average working pressure of 150-psi.

1.11 Manual Air Release Valves

See "Detail Sheet" Plan Sheet for description of the manual air release valves.

1.12 Air Valve Pit

Air valves shall be installed in a pit as shown on the Plan Details.

1.13 Blowoff Assemblies

Blowoff assemblies shall be installed in accordance with the details and Specifications at the locations shown on the Plans or as directed by the Engineer for the purpose of removing any obstacles or impurities from the main. The blowoff assembly shall be connected to the main with a typical tapping saddle and corporation stop. The piping shall be 2 inch VC installed as shown in the details with a 2 inch iron body bronze mounted gate valve and 2 piece case iron valve box and lid marked "Water". The lid shall be secured with a pentagon lock nut.

1.14 Fire Hydrants

New fire hydrants shall be of the dry barrel type and be installed where indicated on the Drawings or otherwise directed by the Engineer. Hydrants shall be installed in such a manner as to be completely accessible and in such a position as to minimize possibilities for damage from vehicles or to pedestrians. Hydrants shall be set plumb with nozzles at least 18" above grade. The barrel shall be turned so that the pumper nozzle will face the street. When placed behind curb, the hydrant shall be set so the nozzle will be at least 12 inches from the gutter face of the curb, or at least 5 feet from the edge of the street or road where no curb exists.

Hydrants shall be supported upon a poured-in-place block of concrete as detailed. Such block shall not interfere with joint maintenance nor with proper hydrant drainage, but shall insure zero movement between the hydrant and the main.

Fire hydrants shall conform in all respects to the current Standards of the AWWA. They shall have a 6" inlet and be equipped with two (2) 2-1/2" hose nozzles and one (1) pumper nozzle; nozzles shall be standard to local governmental agencies' requirements. Each hydrant shall be equipped with traffic damage repair kits and hydrant wrenches provided for every five (5) hydrants.

1.15 Service Piping

Unless otherwise noted on plans service piping shall be high density ¾" Polyethylene (PE 3408) tubing or approved equal.

The piping shall be Type III C 5 P 34 as designated in ASTM-D-1248 ("Polyethylene Plastics Molding and Extrusion Materials") and shall be classified as a PE 335433 according to ASTM D-3350 ("Polyethylene Plastics Pipe and Fittings Materials")

1.16 Connection to Main

Service pipe connections to the main shall be made with a tapping saddle and corporation stop as shown in the Plans.

1.17 Setters

Setters shall be Ford 70 Series with 90° brass angle meter valve and 90° coupling sized for 5/8" x ¾" and ¾" meter, or approved equal.

1.18 Meters

All water meters shall be 5/8" x ¾", plastic or bronzed bodied, of the magnetic oscillating piston or rotating piston type with a working pressure of 150 psi and shall conform to the AWWA specifications for Cold Water Meters.

The main case shall be frost-proof with a single, hinged lid cover with raised characters indicating the direction of flow and manufacturers serial number. Strainers with an effective area at least double that of the main case inlet shall be of a non-corrosive material and should fit tightly against the main case.

The measuring chamber shall be of a non-corrosive material and shall be securely positioned in the main casing. Discs shall be straight reading U.S. Gallons type with a measuring capacity of 999,999 gallons. All parts shall be as non-corrosive as possible and completely encased and hermetically sealed.

Measuring accuracy shall conform to AWWA Standard C 700, latest edition. Testing will be done at Engineers request and any meter found defective shall be returned to the manufacturer for replacement or repair at manufacturer's expense.

11.19 Meter Boxes and Covers

All meters shall be installed in new concrete boxes unless otherwise shown on the plans or approved by the Engineer.

The box shall be a precast concrete vault (18" to 21") I.D. and 24" in height. The cast iron lid shall have an 11 ½" minimum opening with "Water Meter" stamped on top.

1.20 Back Flow Preventers

Back Flow preventers shall be angle check valves installed on customer side of meter. Such valves shall be brass or ductile iron with stainless steel spring. Type shall be Ford, Mueller, or approved equal.

1.21 Connection to Customer Service Line

All connections to the customers existing service line shall be made at the meter Setter connection only unless otherwise directed by the Engineer.

TECHNICAL SPECIFICATIONS

SECTION E

PIPING WORKMANSHIP AND CONSTRUCTION METHODS

1. EXCAVATIONS AND GRADING

1.1 General

This section shall include all clearing and grubbing, site preparation, excavating of earth and other material, filling, site restoration and grading, and other allied work necessary for the construction required for the project.

Any construction methods not specifically outlined in these specifications will be governed by the Kentucky Transportation Cabinet Standard Specifications (Latest Revision)

1.2 Site Preparation

Prior to commencing construction operations the contractor shall make all the provisions necessary to assure the protection of all existing improvements, both public and private. He shall protect trees, shrubs, plantings, and grassed areas and shall make provisions for maintaining public travel in an acceptable manner.

1.3 Protection of Existing Improvements

Before any excavation is started, adequate protection shall be provided for all lawns, trees, shrubs, landscape work, fences, sidewalks, hydrants, utility poles, streets, alley and driveway paving, curbs, storm sewers, ditches, headwalls, catch basins, surface inlets and all other improvements that are to remain in place. Such protection shall be provided as long as necessary to prevent damage from Contractor's operations. Shrubs, bushes, small trees and flowers, which have to be removed to permit excavation for the water lines, shall be protected and replanted or replaced when backfill is complete.

The Contractor shall exercise every precaution to prevent damage to property within the outside easements. He shall remove all debris and rock from the site and restore the ground surfaces, replace or repair all driveways, buildings, fences, retaining walls, etc., which are removed or damaged during construction.

Repairs, restoration or replacement of any improvements damaged or removed, whether shown on the plans or not, shall be the obligation of the Contractor at no additional cost to the owner.

1.4 Maintenance of Public Travel

Maintenance of all traffic shall be in accordance with any requirements of the local road department(s) and/or the Kentucky Department of Transportation. It is the responsibility of the Contractor to coordinate all work with and notify the above-named agencies, and to provide all necessary signs, barricades, lights, flagmen, and other items for maintenance of traffic.

Public travel shall be maintained, unrestricted, wherever and whenever possible. Detours shall be provided when so directed by the appropriate agency. Adequate precautions shall be taken to provide for the safety of both vehicular and pedestrian traffic. Emergency vehicles shall be provided access to construction area at all times.

Unless specifically directed otherwise by the Engineer, no more than five hundred (500') feet of trench shall be opened ahead of the pipe laying, and not more than five hundred (500') feet of open ditch shall be left behind the pipe laying. All barricades, lanterns,

watchmen, and other such signs and signals as may be necessary to warn the public of the dangers in connection with open trenches, excavations and other obstructions, shall be provided by and at the expense of the contractor.

When so required, or when directed by the Engineer, only one-half (1/2) of the street crossing and road crossings shall be excavated before placing temporary bridges over the side excavated for the convenience of the traveling public.

All backfilled ditches shall be maintained in such manner that they will offer no hazard to the traveling public and the property owners abutting the improvements shall be taken into consideration. All public or private drives shall be promptly backfilled or bridges at the direction of the Engineer. Excavated materials shall be disposed of as to cause the least interference, and in every case the disposition of excavated materials shall be satisfactory to the Engineer.

1.5 Drainage

The Contractor shall make provisions for handling all flows in existing creeks, ditches, sewers and trenches by pipes, flumes or other approved methods at all times when natural functioning of said creeks, ditches, sewers and drains. The Contractor shall at all times during construction provide and maintain sufficient equipment for the disposal of all water which enters the excavation, both in open cut trenches and in tunnels, to render such excavation firm and dry, until the structures to be built thereon are completed.

1.6 Excavation

1.6.1 General

Materials of excavation shall be unclassified and shall include whatever materials are encountered to the depth of the plans, stated in the specifications, or directed by the Engineer.

1.7 Disposal of Unsuitable Materials

Excavated materials, which are either surplus and not required or are unsuitable for backfilling shall be removed from the site of operations as soon as excavated.

All excavated materials so removed shall be disposed of, at no additional cost to the owner, on sites acquired by the Contractor and approved by the Engineer.

1.8 Storage of Suitable Materials

Excavated materials suitable and required for backfill shall be stored in neat piles adjacent to the excavation in a manner so as to interfere as little as possible with traffic, but shall not be placed at such heights above or closeness to the sidewalls of the excavation to endanger such operations due to slides or cave-ins.

1.9 Open Cut Excavation for Structures

In excavation for masonry and concrete structures, the required width shall be such as to permit forms to be constructed in the proper manner and to permit proper backfilling on completion of the structures.

Depth of excavation for footings shall be as shown on the drawings and/or as directed by the Engineer to obtain sufficient bearing.

1.10 Open Cut Excavation for Pipeline Trenches

Open Cut excavation, either in earth or rock, shall be safely supported and of sufficient width and depth to provide adequate room for the construction or installation of the work to the lines and dimensions called for by the plans.

Before laying the pipe, the trench shall be opened far enough ahead to reveal obstructions that may be necessitate changing the alignment of the pipeline.

1.11 Trench Dimension

Excavations for water pipe in both earth and rock shall have a minimum allowance trench width as shown on the details which will permit good workmanship in laying the pipe and fittings, boring and jacking and compaction of backfill at he sides of the pipe, and shall be subject to the approval of the Engineer.

The maximum allowance trench width shall be no greater than 2' - 0" + the outside pipe diameter except where such dimensions may prohibit any other construction such as the boring and jacking of service connections under paved surfaces.

Subgrade – the depth of excavation below the pipe – shall be 3" minimum in earth trench and 6" in rock trench unless other wise stated in the plans and Specifications or approved by the Engineer.

1.12 Shoring, Sheering and Bracing

The Contractor shall furnish, place, and maintain adequate sheeting and bracing as may be required to support the sides of the excavation and prevent any movements of earth which could, in any way, diminish the width of the excavation to less than that necessary for proper construction, cause damage to the waterline or structures, utilities, pavements, or walks, or cause injury to workmen or others through movement of the adjacent earth banks, or to otherwise damage or delay the work.

The design and installation of all sheeting, sheet piling, bracing and shoring shall be based on computations of pressure exerted by the materials to be retained under existing conditions. Adequate and proper shoring of all excavations shall be the entire responsibility of the Contractor, however, the Engineer may require the submission of shoring plans (accompanied by supporting computations) for approval prior to the Contractor undertaking any portion of the work.

1.13 Blasting

When blasting is required for the removal of rock, every precaution shall be used for the protection of persons and private and public property. The method of blasting will be as determined by the Contractor, subject to the approval of the engineer, prior to construction.

The Contractor shall comply with all laws, regulations, and ordinances of the local governmental agencies and the Commonwealth of Kentucky relating to the transportation, storage and use of any and all explosives or blasting agents. Compliance with all of the above stated regulations and submittal of the method of blasting as stated above does not in any way relieve the contractor of responsibility for any damage caused by the blasting. Any damage thus caused shall be promptly and satisfactorily repaired by the Contractor at no additional cost to the owner.

1.14 Unauthorized Excavation

Whenever the excavation is carried beyond or below the lines and grades given by the Engineer, the Contractor at his own expense shall refill such excavated space with such material and in such a manner as will insure stability of the structure involved.

1.15 Removal of Water

The Contractor, at his own expense, shall provide adequate facilities for promptly removing water from all excavations. No water lines shall be laid in a trench which is holding water.

1.16 Backfill, Embankment, and Grading

1.16.1 General

This section includes the filling of the excavated trenches and spaces around the completed structures or pipelines to the original grades or to finished grades as indicated on the plans.

1.16.2 Trench Backfilling in Unpaved Areas

Backfilling of Trenches in open cut shall be commenced as soon as possible after the distribution main and service taps to the main have been completed, and all jointing and alignment has been approved by the Engineer.

Selected excavated material containing no rock shall be carefully and solidly tamped around the pipe from the tip of the cradle or encasement up to a plane at least one (1) foot above the exterior of the pipe or structure. The filling of the trench shall be carried on simultaneously on both sides of the pipe in such a manner that the completed pipe line, except as may be necessary in tamping or backfilling, shall not be permitted, until the trench has been backfilled to that height.

The Contractor may use any type of earth moving equipment he has at his disposal, provided such equipment is in satisfactory condition, and of such type and capacity that the work may be accomplished properly, the grading schedule maintained, and the required density obtained. Any questionable suitability problems related to earth moving equipment shall be resolved by the Engineer.

The selected excavated backfill materials used between the plane one (1) foot above the ground surface may include rock fragments taken from the excavation.

In backfill containing rock, no rock fragment shall be larger than 1 cubic foot in size and all rock fragments shall be mixed with sufficient earth materials to completely eliminate all voids, subject to the approval of the Engineer. The amount of rock in the backfill shall not exceed 33% of the total backfill. Rock fragments and surplus earth materials not used in the back fill shall be removed from the site of the work.

In filling the remainder of the trench, from the plane one (1) foot above the pipe to the top of the trench, the backfill material may be shoveled into the trench without compacting, and heaped over whenever, in the opinion of the Engineer, this method of backfilling may be used without inconvenience to the public.

Before final acceptance, the Contractor will be required to level off all trenches where backfill material has been piled up, or to bring the trench up to the level of the surrounding street, roadway, or terrain where necessary, also, the removal from the streets, roadways, and private property of all excess earth or other materials.

1.16.3 Trench Backfilling in Paved Areas

In areas where street paving is to be replaced, trenches shall be backfilled up to one (1) foot above the top of pipe or structure using the methods described

above for unpaved areas. Backfill above this level shall be placed in layers not exceeding eighteen (18) inches and firmly tamped into place by tampers or rammers to 95% of Standard Proctor Maximum Density. In lieu of tamping the trench may be backfilled with granular material and puddled and jetted under the direction of the Engineer.

1.16.3 Backfill Around Structures

Sandy backfill material or selected excavated materials containing no rock shall be placed in uniform layers around air valve pits or other structures and shall be thoroughly tamped and compacted.

1.16.4 Backfill Around Iron Pipe

Selected excavated materials composed of clay, sand, gravel or other materials non-injurious to iron pipe shall be used for backfilling within 24 inches of iron pipe. Cinders, rubbish and other materials which would be injurious to iron pipe shall not be used in such backfilling.

1.17 Restoration of Ground Surfaces and Cleanup

1.17.1 General

All ground surfaces in public rights-of-way, easements and on private property that have been damaged or destroyed by the Contractor's operations shall be restored to original contours and in accordance with the following specifications.

1.17.2 Restoration of Grassed Areas with Sod

Where so designated, all established grassed areas shall be restored with sod containing grasses of comparable quality. Sod shall be placed and rolled so that the final elevations of the area being restored are the same as existed prior to the beginning of construction. Sod shall be pegged where necessary, and shall be watered and cared for to assure its survival until final acceptance of the project.

1.17.3 Restoration of Grassed Areas with Seed and Mulch

The Contractor shall seed and mulch all disturbed areas, unless otherwise specified, in the following manner: Rye or Fescue Seeding – The ground shall be loosened approximately 3 inches deep with a disc or harrow; fertilized with 25 pounds of 10-10-10, or equivalent, and 100 pounds of agricultural lime per 1,000 square feet; sown at a rate of 75 pounds per acre with an approved grade of perennial rye or Kentucky No. 31 Fescue grass seed that will provide early growth during the season in which it was planted. The seed shall be well raked or boarded into the soil.

The time of application of the seed and fertilizer shall be at the discretion of the Engineer.

Unless otherwise permitted by the Engineer, vegetable materials for mulching shall be wheat, oat, barley or rye straw only. All material shall be reasonably free from weed seeds, foreign material, and other grasses and chaff, and shall contain no Johnson Grass. The straw shall be reasonable bright in color and shall not be musty, mouldy caked or of otherwise low quality. It shall be dry on delivery.

Unless otherwise specified, the bituminous material to be used for "tying down" straw mulch shall be a slow setting emulsified asphalt. It shall be non-toxic to plants.

Mulch net shall be used, if directed by the Engineer, to hold mulch in place until turf is established. The net shall be made of a tightly twisted kraft paper yarn, leno woven with a warp count of one pair of yarns per two (2) inches and a filling count of two per inch. Salvage edges and center shall be reinforced with polyethylene filament. The material shall a minimum width of 45 inches.

1.18 Cleanup

Before final acceptance of the work, the Contractor shall satisfactorily clean all areas within the limits of his operations including the street surfaces, walks, gutters, fences, lawns, private property and structures, leaving them in as neat, clean and usable condition as originally found. He shall remove all machinery, tools, surplus materials, temporary buildings and other structures from the site of work. He shall remove all organic matter and materials containing organic matter from all areas and places used by him during construction. All sewers, manholes, inlets, etc., shall be cleared of all scaffolding, sedimentation, debris, rubbish and dirt.

Where the Contractor's operations have resulted in filling existing ditches, clogging existing culverts, damaging existing bridges, ground surfaces, sidewalks, driveways, etc., the Contract shall reditch, clean culverts, repair or replace bridges, ground surfaces, sidewalks, driveways, etc., so as to return them to a condition as good as or better than existed prior to the beginning of his operations.

The Contractor's cleanup operations, which include repair, restoration or replacement of ground surfaces and existing improvements and the removal of rock, shall be performed continuously during the construction operations.

TECHNICAL SPECIFICATIONS

SECTION F

PIPING WORK

1. PIPEWORK

1.1 General Description

After the trench is excavated to subgrade as specified, it shall be filled to the proper depth with crushed stone or concrete as specified to provide a firm and satisfactory bed, hereafter referred to as the cradle or encasement, for the entire length of the pipe barrel. Pipe of designated class and required size shall be laid to form a closed joint with the next adjoining pipe, bringing the inverts continuously to the required depth of cover shown on the plans, the pipe shall be laid in an upstream direction, with bells upstream, unless otherwise permitted or directed.

In no case shall water be allowed to rise in or above the pipe before the joint has become thoroughly set. No walking on or working over the pipes after they are laid, except as may be necessary in placing and compacting the backfill, will be permitted until they are covered with backfill to a depth of one (1) foot.

The trench backfill shall be placed in accordance with backfill requirements of these Technical Specifications.

1.2 Cradle and Encasement

The cradle or encasement, as required to support and protect the water pipe, shall be of crushed stone or concrete and shall be installed as specified herein or as directed by the Engineer to the dimensions as shown on the plans.

1.2.1 Crushed Stone Cradle

Where indicated on the plans water main shall be installed with a crushed stone cradle.

Where the water pipe is to be laid in a crushed stone cradle, the crushed stone to be used shall be Kentucky Highway No. 9 or No. 78 crushed stone, as specified by the Kentucky Transportation Cabinet. The crushed stone shall be deposited in the excavated trench to depth shown on plans, allowing for the pipe wall thickness and providing "bell holes" for making joints, where pipe is of the bell and spigot type. The pipe shall be laid to the depth as shown on the plans and crushed stone shall be carefully deposited around the pipe up to a plane through the centerline of the pipe as indicated on the plan details.

1.2.2 Concrete Cradle

Where a concrete cradle is required as additional support for the water pipe, concrete, as specified in the concrete section of these Technical Specifications and Section 601 of the Kentucky Transportation Cabinet Standard Specifications, shall be used. First, the water pipe shall be laid accurately to the depth indicated on the plans, setting the pipe upon concrete blocks or saddles installed to provide both vertical and lateral supports for the pipe. The supporting of pipe on wooden blocks will not be permitted.

1.2.3 Concrete Encasement

Where a concrete encasement is specified, concrete, as specified in the Concrete Section of these Technical Specifications and Section 601 of the Kentucky Transportation

Cabinet Standard Specifications, shall be used. The water pipe shall be laid and supported in accordance with the specifications for water pipe and concrete cradle, as heretofore specified, and the concrete deposited around the pipe at the required width and depth to a plane at least 6 inches over the top of the pipe, as indicated on the Plan Details. Proper bracing of the pipe shall be provided to prevent its being floated by the concrete encasement.

1.3 Metered Service Connections

Metered service connections shall be installed to the point where the line from the customers residence or business joins the meter setter. The service piping shall be ¾" polyethylene tubing as noted in the Piping Appurtenances Section of these Technical Specifications. They shall be installed as shown on the plans or as directed by the Engineer.

1.4 Meter Boxes and Other Structures

Meter boxes shall be constructed as shown on the Plan Details. The concrete vault shall be placed on concrete bricks, with 6" crushed stone placed in the bottom for drainage.

The cast iron lid shall be set flush with existing ground or ½" maximum above ground. Backfill shall be carefully tamped around both vault and lid. Vaults placed in sidewalks, driveways, or other paved surfaces shall have lids placed flush with existing paved surfaces.

Service line depth shall be the same as the main water line with the exception that the service line may be brought up to a sufficient depth to enter the vault within 5' of the side of the vault.

Air release valve vaults shall be Type III 24" diameter Reinforced Concrete Pipe barrels set on 8 concrete bricks with 6" crushed stone in bottom for drainage. The lid shall be cast iron stamped "water" with 24 I.D. opening. Backfill shall be carefully tamped around vault and lid. The lid shall be flush or ½" maximum above existing ground in unpaved areas and flush with paved surfaces.

1.5 Branches and Fittings

Branches and Fittings shall be provided and laid as where directed.

Tapping saddles or other fittings for property service connections shall be placed on the water main at such points as to result in the property service connection having the shortest length possible between the water main and the property line unless otherwise indicated on the plans or directed by the Engineer.

1.6 Pipe Cutting

Pipe may be cut in any manner specified by the pipe manufacturer, but only when authorized and approved by the Engineer. Where a pipe is cut the Contractor shall remove the old section of pipe satisfactorily to the Engineer.

1.7 Pipe Handling and Installation

All procedures for receiving, handling, storing, and installing pipe used in the project, unless specified in these Technical Specifications, shall be governed by the Standards listed below with the approval of the Engineer.

Ductile Iron Pipe - The manufactures printed instructions.
Polyvinyl Chloride Pipe - The manufactures printed instructions.
Polyethylene Pipe - The manufactures printed instructions.

1.8 Pressure Pipe Thrust Blocking

Concrete thrust blocks shall be provided to prevent movement of pipe or appurtenances in response to the forces developed by the pressure of the piping system. In general, thrust blocking shall be provided where the pipeline changes direction (e.g. tees, bends, elbows, crosses, etc.), changes size (e.g. reducers), stops at dead ends, and/or has an appurtenance (e.g. valve or hydrant) attached at which thrust develops when closed. Thrust blocks shall be sized according to the plans.

1.9 Highway and Railroad Crossings

Steel casing pipe for road and railroad crossings shall be bored and/or jacked in place to the depth shown on the plans. Casing pipe shall also be laid in open cut where indicated on the drawings. All joints between lengths shall be solidly butt-welded with a smooth non-obstructing joint inside. The casing pipe shall be installed without bends. The water line pipe shall be installed after the casing pipe is in place, and shall be braced within the casing with structural steel members welded into place or other Engineer approved method to preclude possible floatation.

Railroad crossing material and installation shall be in strict accordance with American Railway Engineering Association Specifications.

At each end of the casing pipe, the water line pipe shall be wrapped with two layers of roofing felt. The wrapping shall extend a minimum of 12 inches in each direction from the end of the casing pipe. After the water line has been installed, inspected, tested and wrapped as specified, both ends of the casing pipe shall be closed with brick or concrete block masonry in a manner acceptable by the Engineer.

Weep holes shall be provided in the closure at the lower end of the casing pipe to facilitate drainage and shall be located within the granular pipe bedding material. Granular bedding is not required under the open cut casing pipe; however, the Contractor shall insure that casing pipe does not bear directly on rock.

1.10 Creek Crossings

River and creek crossings shall be accomplished in a method determined by the Contractor and approved by the Engineer to the lines and grades as shown on the plans. Piping shall be ductile iron or polyethylene pipe as per the pipe materials section of these Technical Specifications and as approved by the Engineer. There are multiple types of creek crossings, which shall be as shown on the plans and where indicated on the plans.

1.11 Pipeline Testing

1.11.1 General

Testing at the Contractor's expense of any water line section may be requested at any time by the Engineer to determine that the section is watertight.

1.12 Visual Inspection

During the final inspection the Engineer may inspect any section of the water lines by various methods at his disposal to determine whether the completed lines are true to line and grade as laid out or as shown on the Plans.

1.13 Hydrostatic Tests

After the pipe is laid and the line flushed, it shall be filled with water with care being exercised to expel all air from the pipe. During the test period all pipe, valves, fittings, and joints shall be examined carefully for defects. Any observed leaks or defective pipe shall be satisfactorily repaired or replaced, at the expense of the Contractor and the test repeated until the section tested is within the limits prescribed hereinafter. The entire distribution system or parts thereof shall be tested under hydrostatic pressure of 150-psi, or pressure class of the pipe which ever is greater, for a period of 4 hours, if joints are exposed, or for an 8 hour period if joints are covered. Repairs shall be made using approved materials and new replacement fittings, specials, or gaskets where leakages occur.

Leakage shall be measured by an approved calibrated meter through which all the water required to maintain test pressure shall be pumped. All testing shall be performed in the presence of the Engineer. Allowable leakage shall not exceed 10 gallons per 24 hours per inch of diameter per mile of pipe, at the specified test pressure.

Tests shall be completed in accordance with the latest edition of AWWA C-600 except a modified herein.

1.14 Flushing

Any foreign material left in piping during construction shall be removed by flushing system prior to testing. Flushing should be accomplished by partially opening and closing valves and hydrants several times under expected line pressure with flow velocities adequate to flush foreign material out of valves and hydrants.

1.15 Disinfection

1.15.1 General

Thoroughly disinfect all water pipe on potable water lines prior to being placed in service. Follow the applicable provisions of the procedure established for the disinfection of the cast iron pipe as set forth in the latest edition of AWWA C651 entitled "Disinfecting Water Mains".

1.15.2 During the Construction

Workmen shall be required to use utmost care to see that the surface of parts of the structures, the inside of pipes, fittings, jointing materials, valves, and specials which come in contact with the local water system's water, are maintained in a sanitary condition. Every effort shall be made to keep the inside of the pipe, fittings, and valves free of all foreign matter, sticks, dirt, rocks. As each joint of pipe is being laid, it shall be swabbed so that all foreign matter is removed. All fittings and exposed open ends of pipe shall be blocked or capped until the line is completed.

When the entire pipe line or certain selected sections thereof have been completed, tested and made ready for turning over to the local water system, ready for use, the line or section of line shall be thoroughly sterilized according to the following procedure: The new pipe shall be disinfected by introducing HTH, perchloron, or a similar hypochlorite solution, through taps made by the Contractor as directed by the Engineer. The water shall be turned into the mains slowly to allow a thorough mixing of solution which shall be brought to a strength of 50 parts per million of available chlorine. All valves shall then be closed and the sterilizing solutions permitted to remain in the pipeline sections for not less than 24 hours. At the end of the 24 hour period the water in the line must have a

minimum chlorine residual of 25 parts per million, or the process shall be repeated until the residual of 25-ppm is maintained. After the required chlorine residual has been maintained the mains shall be flushed thoroughly until a chlorine residual not to exceed one (1) part per million is obtained.

No water line shall be put in service either permanently or temporarily until it has been thoroughly disinfected to the satisfaction of the Engineer. The Contractor shall be responsible for all bacteriological testing should this be required by the Engineer.

1.16 Restoration of Paved Surfaces

1.16.1 General Description

After all excavations within the limits of paved surfaces have been properly backfilled and compacted in accordance with the Plans and Specifications, the paved surfaces shall be restored to a condition as good as or better than existed prior to the beginning of the work, in accordance with the following Specifications.

1.17 City, County, and State Paved Surfaces

Streets, alleys, sidewalks, curbs, and gutters originally constructed by ordinance or maintained by the City, and highways, roads, and walks constructed and/or maintained by the Kentucky Transportation Cabinet or County, which are wholly or partially removed, damaged or disturbed by the Contractor's operations, shall be promptly restored to a condition as good as or better than existed prior to the beginning of the work. Such restoration shall be performed in accordance with the pertinent Specifications and standards of the City, the County, or the Kentucky Transportation Cabinet as applicable.

1.18 Other Paved Surfaces

Streets, alleys, driveways, sidewalks, curbs, and gutters, not constructed or maintained by the City, the Kentucky Transportation Cabinet, or the County, but paved with asphalt, concrete, cinders, crushed stone, waterbound macadam, oilbound macadam, or heterogeneous paving materials, which are wholly or partially removed, damaged or disturbed by the Contractor's operations, shall be restored with like or better materials, acceptable to the Engineer, to a condition as good as or better than existed prior to the beginning of the work, so that the movement of traffic, both vehicular and pedestrian, through the restored way shall be as free, safe and unimpeded as before.

1.19 Asphalt Roadway Paving

Existing asphalt paving in roadways shall be restored with base, binder and surfacing of the dimensions as shown in the plans. All material shall conform to the Materials section of these Technical Specifications and construction methods shall conform to Sections 300 and 400 of the Kentucky Transportation Cabinet Standard Specifications with the approval of the Engineer.

1.20 Concrete Roadway Paving

Existing concrete paving in roadways shall be restored with the dimensions shown in the plan details. All materials shall conform to the Materials section of these Technical Specifications and construction methods shall conform to Section 500 of the Kentucky Transportation Cabinet Standard Specifications with the approval of the Engineer.

1.21 Driveway Replacement

For the restoration of all paved driveways disturbed by the installation of the water lines, the materials and dimensions shall be equivalent to the original paving. However, in no case shall the dimensions be less than (a) 6" DGA base and 6" Class "A" Concrete for concrete driveways and (b) 6" DGA base and 2" Bituminous Surface for asphalt driveways.

Standard Sanitary Sewer Bid Item Descriptions

S BYPASS PUMPING This item shall include all labor, equipment, and materials needed to complete a bypass pumping and/or hauling operation for diversion of sewage during sanitary sewer construction. Examples of such operations when bypass pumping and/or hauling may be necessary is during force main tie-ins, manhole invert reconstruction, insertion of new manholes into existing mains, or other similar construction. There may be more than one bypass pumping/hauling operation on a project. This item shall be paid for each separate bypass pumping/hauling operation occurrence as called out on the plans or directed by the engineer and actually performed. There will be no separate bid items defined for length, duration, or volume of sewage pumped or hauled in each occurrence. If a bypass pumping/hauling operation is called out on the plans; but, conditions are such that the bypass pumping/hauling operation is not needed or utilized, no payment will be made under this item. The contractor shall draw his own conclusions as to what labor, equipment, and materials may be needed for each bypass pumping/hauling occurrence. The contractor should be prepared to handle the maximum volume of the sewer being bypassed, even during a storm event. This item shall not be paid separately, but shall be considered incidental, when bypass pumping and/or hauling is needed during cast-in-place-pipe (CIPP) and/or point repair operations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA).

S CIPP LATERAL SERVICE INVESTIGATION This item shall include all equipment, materials, labor and incidentals necessary to enter the sewer in compliance with all safety/confined space requirements and perform the identification, assessment and pre-measurement of all existing and abandoned laterals for the placement of Cured-In-Place-Pipe lining. This item shall be in payment for all lateral service investigation for all sewer segments to be lined as a part of this contract. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be LUMP SUM (LS).

S CIPP LATERAL REINSTATEMENT This item is to pay for installing a Cured-In-Place-Pipe liner in service laterals and service/mainline connections to stabilize structural defects and construction inadequacies. This bid item shall include all labor, equipment, materials and incidentals necessary to perform the service lateral reinstatement in accordance with the plans and specifications. Work under this item shall include bypass pumping, sewer flow control, pre-installation cleaning, sealing connections to existing sewer main, pre- and post- construction CCTV inspection and final testing of the CIPP system. This item shall also include the "top hat" required by the specifications. All CIPP lateral reinstatements shall be paid under this item regardless of the size or length of reinstatement. No separate bid items of varying sizes or length of CIPP lateral reinstatement will be provided in the contract. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be EACH (EA) for each CIPP lateral reinstatement complete and ready for use.

S CIPP LINER This bid Item is to pay for rehabilitation of existing sanitary sewers using the Cured-In-Place-Pipe method. This bid item description applies to all CIPP sizes included in the contract.

All CIPP Liner items of all varying sizes shall include all labor, materials, customer notification, testing, necessary permits, ingress and egress procedures, bypass pumping, pre-construction video, sediment and root removal, dewatering, traffic control, erosion and sediment control, excavation pits, removal and replacement of manhole frames and covers as necessary to facilitate the lining work, sealing at manholes and service connections, clearing and grubbing, pipeline cleaning, re-cleaning and video inspection as many times as necessary, debris collection and disposal, root removal, pre- and post-construction video inspection, all digital inspection footage, final report preparation and approval, the cost of potable water from the Owner, required compliance tests, site restoration, site cleanup, sealing of liner at manholes, acceptance testing and all other rehabilitation work and incidentals not included under other pay items necessary to complete the rehabilitation per the plans and specifications. There will be no separate payment for acceptance testing of the lined pipe; but shall be considered incidental to this item. Pay under this item shall be by each size bid in the contract. Pay measurement shall be from center of manhole to center of manhole. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S CIPP PROTRUDING LATERAL REMOVAL This item includes all equipment, materials, labor and incidentals necessary to enter the sewer in compliance with all safety/confined space requirements, remove a sufficient amount of the protruding tap to insure a proper and safe Cured-In-Place-Pipe lining insertion and perform pre-installation CCTV. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be EACH (EA) for each protruding lateral removed.

S CONCRETE PIPE ANCHOR This item shall be constructed on the sewer pipe at the locations shown on the plans in accordance with sanitary sewer specifications and standard drawings. Payment for concrete anchors will be made at the contract unit price each in place complete and ready for use. Each concrete anchor of sewer pipe or force main shall be paid under one bid item per contract regardless of the sizes of carrier pipe being anchored in the contract. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

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

S ENCASEMENT CONCRETE Includes all labor, equipment, excavation, concrete, reinforcing

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

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

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

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

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

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

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

S FORCE MAIN This description shall apply to all PVC and ductile iron and polyethylene/plastic pipe bid items of every size and type, except those bid items defined as “Special”. This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. This item shall also include pipe anchors on polyethylene pipe runs as shown on the plans or required by the specifications to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

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

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

S FORCE MAIN POINT RELOCATE This item is intended for payment for horizontal and/or vertical relocation of a short length of an existing main at the locations shown on the plans. This bid item is to be used to relocate an existing force main at point locations such as to clear a conflict at a

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

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

Range 1 = All live tapped main sizes up to and including 8 inches

Range 2 = All live tapped main sizes greater than 8 inches

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

S FORCE MAIN TIE-IN This bid description shall be used for all force main tie-in bid items of every size except those defined as "Special". This item includes all labor, equipment, excavation, fittings, sleeves, reducers, couplings, blocking, anchoring, restoration, testing and backfill required to make the force main tie-in as shown on the plans and in accordance with the specifications complete and ready for use. This bid item shall include purge and sanitary disposal of any sewage from any abandoned segments of force main. Pipe for tie-ins shall be paid under separate bid items. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

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

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

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

S LATERAL CLEANOUT This item shall be for payment for installation of a cleanout in a service lateral line. This item shall include furnishing and installation of a tee, vertical pipe of whatever length required, and threaded cap. The cleanout shall extend from the lateral to final grade elevation. The size of the cleanout shall be equivalent to the size of the lateral. The cleanout materials shall meet the same specification as those for the lateral. The cleanout shall be installed at the locations shown on the plans or as directed by the engineer. Only one pay item shall be established for cleanout installation. No separate pay items shall be established for size or height variances. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S LATERAL LOCATE This bid item is to pay for all labor, equipment, and materials needed in locating an existing sanitary sewer service lateral for tie-in of the lateral to new mainline sewers and/or for the relocation of a lateral. This bid item shall be inclusive of any and all methods and efforts required to locate the lateral for tie-in or relocation of the lateral. Locating methods to be included under this items shall include, but are not limited to, those efforts employing the use of video cameras from within an existing sanitary sewer main or lateral, electronic locating beacons and/or tracers inserted into the sanitary sewer main or lateral, careful excavation as a separate operation from mainline sewer or lateral excavation, the use of dyes to trace the flow of a lateral, or any combination of methods required to accurately locate the lateral. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA).

S LATERAL LONG SIDE This bid item description shall apply to all service lateral installations of every size up to and including 6 inch internal diameter, except those lateral bid items defined as "Special". This item includes the specified piping material, main tap, bends, clean outs, labor, equipment, excavation, backfill, testing, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service lateral installations where the ends of the lateral connection are on opposite sides of the public roadway. The new lateral must cross the centerline of the public roadway to qualify for payment as a long side lateral. The length of the service lateral is not to be specified. Payment under this item shall not be restricted by a minimum or maximum length. The contractor shall draw his own conclusions as to the length of piping that may be needed. Payment under this item shall include boring, jacking, or excavating across the public roadway for placement. Placement of a service lateral across a private residential or commercial entrance alone shall not be reason to make payment under this item. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S LATERAL SHORT SIDE This bid item description shall apply to all service lateral installations of every size up to and including 6 inch, except those lateral bid items defined as “Special”. This item includes the specified piping material, main tap tee, bends, clean outs, labor, equipment, excavation, backfill, testing, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for lateral installations where both ends of the lateral connection are on the same side of the public roadway, or when an existing lateral crossing a public roadway will remain and is being extended, reconnected, or relocated with all work on one side of the public roadway centerline as shown on the plans. The length of the service lateral is not to be specified and shall not be restricted to any minimum or maximum length. Payment shall be made under this item even if the lateral crosses a private residential or commercial entrance; but, not a public roadway. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. The contractor shall draw his own conclusions as to the length of piping that may be needed. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

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

S MANHOLE Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole. Payment for manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup in accordance with the specifications and standard drawings. Payment shall be made under this item regardless of whether the base is to be precast or cast-in-place (doghouse). All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE ABANDON/REMOVE Payment under this item is for the partial removal and/or filling of any sanitary sewer manhole regardless of size or depth that no longer serves any purpose. Payment shall be made regardless of whether the manhole is or is not in conflict with other work. Any manhole requiring partial removal, but not total removal, in order to clear a conflict with other work shall be paid under this item. All manholes partially removed shall be removed to a point at least one foot below final grade, one foot below roadway subgrade, or one foot clear of any other underground infrastructure, whichever is lowest. If partial removal of an abandoned manhole is elected by the contractor, the remaining manhole structure shall be refilled with flowable fill. Payment for disposal of a sanitary sewer manhole will be made under this item only. Please refer to the Utility Company’s

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

S MANHOLE ADJUST TO GRADE Payment under this item is for the adjustment of sanitary sewer casting elevation on all sizes of existing sanitary manholes. This work shall be performed in accordance with the sanitary sewer specifications. Payment shall be made under this bid item regardless of the amount of adjustment necessary to a sanitary sewer manhole casting or diameter of the manhole. Work under this pay item may be as simple as placing a bed of mortar under a casting; but, shall also be inclusive of installation of adjusting rings, and /or addition, removal, or replacement of barrel sections. The existing casting is to be reused unless a new casting is specified on the plans. New casting, when specified, shall be paid as a separate bid item. Anchoring of the casting shall be incidental to this item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE CASTING STANDARD Payment under this bid items is for furnishing of a new standard traffic baring casting for sanitary manholes meeting the requirements of the sanitary sewer specifications and standard drawings. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when installed.

S MANHOLE CASTING WATERTIGHT Payment under this bid item is for furnishing of a new watertight traffic baring casting for sanitary manholes meeting the requirements of the sanitary sewer specifications and standard drawings. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when installed.

S MANHOLE RECONSTRUCT INVERT This bid item is to pay for all labor, equipment, and material for rework of the manhole bench to redirect or eliminate flow, such as when the flow of a pipe or pipes are being removed or redirected. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in elimination or redirect of flow. This item shall also include providing and placement of a rubber seal or boot as required by utility specification, standard drawing or plan. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the specifications, standard drawings, and plans. No payment shall be made under this bid when MANHOLE TAP EXISTING, or MANHOLE TAP EXISTING ADD DROP are being paid at the same location, as this type of work is included in those items. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE TAP EXISTING This bid item is to pay for all labor, equipment, and material for coring one opening in an existing manhole base, addition of a rubber seal as specified, and rework of the manhole bench to direct the additional pipe flow. The bid item shall be paid for each core opening added to a single manhole. This bid item shall also include any rework of the existing manhole bench due to the elimination of other existing pipes and flow. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in the addition, elimination, or redirect of flow. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the

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

S MANHOLE TAP EXISTING ADD DROP This bid item is to pay for all labor, equipment, and material for coring one opening in an existing manhole base, addition of a rubber seal as specified, addition of a vertical drop pipe to the outside of the manhole, placement of reinforcing steel and concrete to encase vertical pipe, and rework of the manhole bench to direct the additional pipe flow. The bid item shall be paid for each drop added to a single manhole. This bid item shall also include any rework of the existing manhole bench due to the elimination of other existing pipes and flow. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in the addition, elimination, or redirect of flow. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the specifications, standard drawings, and plans. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH DROP Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole with drop. Payment for drop manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Drop manholes shall include concrete base, barrel sections, drop materials, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup. Payment shall be made under this item regardless of whether the base is to be precast or cast-in-place (doghouse). All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH LINING Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole with corrosion resistant lining. Payment for manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or slab top, steps, lining, excavation, backfilling, air testing, restoration, and cleanup in accordance with the standard drawings. Payment shall be made under this item regardless of whether the base is to be precast or cast-in-place (doghouse). All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH TRAP Payment under this item is for the installation of a new manhole with

trap. Payment for trap manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Trap manholes shall include concrete base, manhole structure and trap materials, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup. All materials, except casting, shall be new and unused. Payment shall be made under this item regardless of whether the base is to be precast or cast-in-place (doghouse). An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S PIPE This description shall apply to all PVC and ductile iron gravity sewer pipe bid items of every size and type 8 inches internal diameter and larger, except those bid items defined as "Special". This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, tap tees and couplings for joining to existing similar or dissimilar pipes), polyethylene wrap (if required by specification), labor, equipment, excavation, bedding, restoration, pressure or vacuum testing, temporary testing materials, video inspection, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. This bid item shall include material and placement of flowable fill under existing and proposed pavement, and wherever specified on the plans or in the specifications. No additional payment will be made for rock excavation. Measurement of quantities under this item shall be through fittings and encasements to a point at the outside face of manhole barrels, or to the point of main termination at dead ends or lamp holes. Carrier pipe placed within an encasement shall be paid under this item and shall include casing spacers and end seals. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S PIPE POINT REPAIR This item is to be used to pay for repair of short lengths of existing sanitary sewer pipe that, through prior video inspection or other means, are known to have pre-existing failure. Pipe Point Repair may be needed in preparation for installation of cured-in-place-pipe (CIPP) lining or other instances where failure is known and repair is prudent. The size of pipe shall not be defined in separate bid items. All diameter sizes of point repair shall be paid under this one item. The materials to be used to make the repair shall be as defined on the plans or in the specifications. This bid item shall include all excavation, pipe materials, joining materials to connect old and new pipe, bedding, and backfill to complete the repair at the locations shown on the plans or as directed by the engineer, complete and ready for use. This bid item shall include bypass pumping when required. Measurement shall be from contact point to contact point of old and new pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

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

be referenced. This item shall be paid LUMP SUM (LS) for each when complete.

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

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

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TECHNICAL SPECIFICATIONS

SEWER

TECHNICAL SPECIFICATIONS

SECTION A

GENERAL INFORMATION AND REQUIREMENTS

1. GENERAL

- 1.1 These technical specification include descriptions of materials which may or may not be used on this project.
 - 1.1.1 The Contractor shall carefully read the Special Provisions for statements concerning other specifications which may be applicable to the Project.
- 1.2 Materials shall be of the types and constructed on the materials specified herein when identified on Plans, Bid Form or Measurement for Payment. Materials and accessories shall be of new and unused material and shall be installed in accordance with manufacturer's specification and/or as shown on the plans.
- 1.3 The Contractor shall be responsible for the safe storage and handling of all material furnished to or by him, and accepted by him, until it has been incorporated into the completed project and the project has been accepted by the Owner.
 - 1.3.1 The Contractor shall handle all materials and equipment in such manner to avoid damage. All material and equipment whether moved by hand, skidways, hoists or other means shall be handled in such a manner to avoid dropping or bumping against other material or equipment.
 - 1.3.2 In distributing material at the site of work, each piece shall be unloaded as near as possible to final installation point to minimize the number of times it must be handled.

2. PROTECTION OF UNDERGROUND AND SURFACE STRUCTURES AND OTHER PROPERTY

2.1 GENERAL

Temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers, and other obstruction encountered in the progress of the work shall be furnished at the Contractor's expense incidental to the project.

2.2 Obstruction by Other Utilities

- 2.2.1 Existing underground utilities shown on the plans are shown in approximate locations based on information furnished by others. Prior to beginning construction of proposed facilities the Contractor shall accurately locate existing underground utilities

by whatever means necessary including excavation where required. The Contractor shall notify the Engineer where utilities, so located will interfere with proposed construction.
- 2.2.2 Where the limits of construction of the proposed work enhances work encroaches upon existing utilities, the Contractor, where possible, shall provide temporary support or protection satisfactory to the owner of the utility to permit continuation of proposed construction and no additional payment authorized.

2.2.3 Where existing utilities are encountered which prohibit construction of proposed facilities unless relocated the Contractor shall so notify the Engineer unless the plans provide for their relocation. Relocation shall be accomplished in a manner acceptable to the owner of the utility, and shall be furnished at the Contractor's expense incidental to the project.

2.3 Property Protection

2.3.1 Extreme care shall be taken to protect trees, fences, poles, crops and all other property from damage unless their removal is authorized by the Engineer. Any damaged property shall be restored to as good or better than original condition and shall meet with the approval of the Engineer and Owner.

2.3.2 The Contractor has the right to fully utilize the easement unless specifically stated otherwise on the plans or by the Engineer. If any irreplaceable trees, fences, poles or crops, such as tobacco, corn, soy beans and such (excluding pasture land), occur on the easement the Contractor shall obtain the engineer's and Owner's approval prior to removing or otherwise causing damage to any of these items.

2.3.3 Beyond the limits of the easement the contractor shall be responsible for any damage caused by his operation and/or his personnel.

3. INCIDENTAL ITEMS OF CONSTRUCTION

3.1 Barricades, Guards, and Safety Provisions

3.1.1 To protect the public from injury and to avoid property damage, adequate barricades, construction signs, warning lights and guards shall be placed and maintained by the Contractor during the progress of construction work until it is safe for the public to use the construction site.

3.1.2 The Contractor shall provide and maintain all safety facilities and devices required by the Occupational Safety and Health Act (OSHA). The Engineer is not responsible for safety provisions furnished or used by the Contractor nor will the Engineer advise or direct safety operation of the Contractor.

3.2 Traffic and Utility Control

3.2.1 All excavations shall be conducted in a manner to cause the least interruption to traffic. The Contractor shall provide suitable bridges at streets and driveways where traffic must cross excavated areas.

3.2.2 Driveways and other private and public access routes shall not be kept blocked or closed by the Contractor for more than a reasonable period of time without prior written approval from the property owner or controlling authority.

3.2.3 Existing fire hydrants, valve pit covers, valve boxes, meter boxes, curb-stop boxes, fire or police call boxes or other utility controls shall be kept unobstructed and accessible during the construction period.

3.3 Maintenance of Utility Service and Flow of Drains

3.3.1 Adequate provisions shall be made for the maintenance of flow in sewers (storm of sanitary), drains, water lines and gas lines and electrical lines encountered during construction.

- 3.3.2 No valve, switch or other control device of any utility system within the construction, area shall be operated by the Contractor without approval of the utility except in cases of an emergency. All utility customers which will be affected by the operation of any utility valve or control device shall be notified by the Contractor in sufficient time for each customer to make arrangements for the period of no service. Each customer shall be advised as to the time service will be off and probable time when it will be resumed.

3.4 Fencing

- 3.4.1 When the pipe line is being constructed through fields where livestock is being held the contractor shall provide, either temporary fencing or stationing of personnel, adequate protection to livestock from machinery and open trenches. The Contractor shall take all precautions necessary to insure that all animals are not isolated.
- 3.4.2 Where pipe line crosses fences in good condition and the work area is easily accessible through gates, the Contractor shall excavate or tunnel beneath the fences.
- 3.4.3 When it is necessary to cut existing fences, new end posts shall be installed one each side of the construction easement and old fence thoroughly stapled to these new posts before cutting fence.

After pipe is installed at this point and backfill is completed, a new fence of galvanized wire (No. 9 gauge) shall be stretched between the new posts and thoroughly stapled to existing post

and any new intermediate posts necessary to provide a good fence. Replacement of fences shall be on an in kind basis and shall be considered incidental to installation of the pipe line.

4. SUMMARY

4.1 The Contractor shall furnish at the site of Work, all materials, labor and equipment necessary to complete the Work in accordance with the terms of the Contract and as required hereunder. He shall make the required excavation for installing the sewer lines and all other appurtenant structures: do all ditching, diking, pumping, bailing and draining or otherwise lowering and disposing of water encountered in the excavation necessary for rendering the foundation firm, dry and adequate for installing the sewer lines and appurtenances; do, as required, all sheeting, shoring, bracing, coffer damming and supporting; provide all lighting, barricades, signs, flagmen and watchmen: make all provisions necessary to maintain and protect, buildings, paved surfaces, fences, trees, shrubs, piles, water pipes, gas pipes, sewers, water courses, surface drains, railroads, railways and other structures in, on, across or adjacent to the Work and repair all damage done to them where and as required; provide all temporary bridges, detours or other means of maintaining travel, both vehicular and pedestrian; construct all concrete, brick and like work; lay all sewer connections; set in place all iron and other metal work; backfill all trenches; restore walks, grass pots, shrubs, trees, flowers, fences, paved surface, etc. damaged or disturbed; clear away all rubbish and surplus materials; furnish all materials, tools, implements, machines, tracks, pumps, forms, supplies and labor required to build and put in complete and acceptable working order the sewer lines and appurtenances covered by the Contract Documents and described by the plans and specifications.

TECHNICAL SPECIFICATIONS

SECTION B

PIPING MATERIALS AND WORKMANSHIP

1. **GENERAL**

This section shall include all exterior sanitary sewer piping, and appurtenances required for completion of a working piping system. All components shall be furnished and installed as shown on the Drawings, specified herein, and/or required by good practice.

2. **PIPING MATERIALS**

2.1 **General**

All materials necessary for the completion of the work shall be furnished by the CONTRACTOR, as approved by the ENGINEER to meet the requirements of the Plans and Specifications. Any materials found to be defective or not meeting the Specifications shall be rejected and replaced by approved materials at no additional cost to the Owner.

2.2 **Polyvinyl Chloride (PVC) Gravity Sewer**

Polyvinyl chloride gravity sewer pipe shall conform to ASTM Standard D-3034 (latest revision) relative to materials, manufacture, dimensions, inspection, testing and markings. Unless otherwise specified, all PVC gravity sewer shall be SDR 35.

Joints for polyvinyl chloride gravity sewer pipe shall be suitable for use with rubber gaskets of an approved compression type and shall conform to the ASTM Standard "Joints for Drain and Sewer Plastic Pipe Using Flexible Elastomeric Seals", D-3212, Latest Revision.

All fittings for use with polyvinyl chloride gravity sewer pipe shall meet the requirements of ASTM Specification D-3034 (SDR), Latest Revision.

Joints for fittings shall be bell and spigot type with rubber gaskets compatible with the pipe and conforming to ASTM, D-3212, Latest Revision.

PVC corrugated sewer pipe with a smooth interior shall meet the requirements of ASTM F949- Latest Revision, "Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings" and the following:

Diameter	Minimum Impact (ft.-lbs.) at 0 degF	Minimum Wall Thickness	
		Outer (in.)	Inner (in.)
4"	100	0.020	0.022
6"	140	0.024	0.025
8"	140	0.035	0.035
10"	140	0.040	0.045

and shall have a minimum pipe stiffness of 55 psi when measured at 5% deflection in accordance with ASTM D 2412. The pipe manufacturer's certification shall be provided with each delivery indicating conformance with these minimum deviations from ASTM F-949.

Joints shall be in conformance with ASTM D 3212 "Specification for Joints for Drain and Sewer Plastic using Flexible Elastomeric Seals", shall be gasketed, bell and spigot, push on type.

2.3 Ductile Iron Pipe (DIP)

Ductile Iron Pipe shall conform to ANSI Specification A 21.51 (AWWA C 151), Latest Revision, relative to manufacture materials, dimensions, inspection, testing and marking. The thickness of ductile iron pipe shall be in accordance with ANSI Specifications A 21.50 (AWWA C 150). Minimum standard thickness class shall be 50 for ductile iron pipe with mechanical joint fittings and shall be 53 for ductile iron pipe with flanged joints except as that shown on the drawings.

All buried ductile iron pipe shall be cement mortar lined and bituminous coated. All exposed ductile iron pipe shall be cement mortar lined and epoxy painted. All process yard piping shall be slip-on joints with mechanical joint fittings and all interior piping and fittings shall be flanged joints except as that shown on the drawings or approved by the ENGINEER. Joints for ductile pipe shall be either the mechanical or the push-on joint type with rubber gaskets (unless otherwise indicated on the Plans) and shall conform to the ANSI Specification for "Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings", A 21.11 (AWWA C 111), Latest Revision.

Fittings to be used shall be ductile-iron and shall conform to the American National Standard for Ductile-Iron Fittings, A 21.10 (AWWA C 110), Latest Revision.

Ductile iron compact fittings meeting all requirements of A 21.10 (AWWA C 110), Latest Revision, are acceptable unless otherwise shown. No compact fittings are acceptable below the center of the clarifier.

2.4 High Density Polyethylene (HDPE) Pipe

High density polyethylene (HDPE) pipe shall conform to ASTM F2648.

Fittings where required by changes in alignment of the pipe shall meet the same standards as that of the pipe and shall be capable of design pressures equal to the piping system.

Where laterals and branch lines enter the pipe, other than at manholes, manufactured fittings or saddles shall be installed per the manufacturer's recommendation. The manufacturer's standard adapters and/or fittings shall be used to connect polyethylene pipe to other types of pipe.

HDPE pipe shall be installed in accordance with the details on the plan sheets and the Corrugated Polyethylene Pipe Association's *Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings*.

HDPE Pipe shall be N-12 WT IB as manufactured by Advanced Drainage Systems or approved equal.

2.5 Polyvinyl Chloride (PVC) Pressure Main

Polyvinyl Chloride force main pipe shall conform to the latest edition of ASTM D2241 and shall be made from Type 1120 material. Joints shall be elastomeric seals complying with ASTM D-3139 or solvent weld in accordance with ASTM D-2855. All products shall meet the approval of the ENGINEER and shall bear the seal of the National Sanitation Foundation. PVC pipe 12" and smaller shall be SDR-21, minimum.

Joints shall be gasket type or, if less than 3 1/2 inches in diameter solvent weld, at the CONTRACTOR'S option, with approval of ENGINEER, and be in accordance with the manufacturer's specifications. Joint bells shall be formed integrally with the pipe and spigots shall be beveled with insertion stop to facilitate proper installation. Rubber ring gaskets shall conform to the manufacturer's standard dimensions and tolerances to meet the requirements of ASTM F-477 and solvent cement shall conform to ASTM D-2564.

2.6 Casing Pipe

Casing Pipe shall be steel, plain end with welded joints. It shall have a minimum yield point strength of 35,000 psi, conforming to ASTM A52 Grade 2, Latest Revision. The diameter of the pipe shall be as shown on the drawings. The wall thickness of the pipe shall be specified by the agency issuing the required crossing permit for the highway or railroad in question, but in no case less than the minimum listed below:

<u>Outside Diameter</u>	<u>Wall Thickness (in.)</u>	
	<u>Under Highway</u>	<u>Under Railroad</u>
20" or less	0.250	0.375
24"	0.250	0.375
30"	0.312	0.375
36"	0.375	0.500
42"	0.375	0.500
48"	0.375	0.500

The ends of the casing pipe shall be plugged and made watertight prior to backfilling. Carrier pipes shall be inserted within the casing by use of casing spacers for multiple carrier pipes. ENGINEER to approve CONTRACTOR's method of making casing watertight and casing spacers for multiple carrier pipes prior to construction in the form of shop drawings.

3. PIPING APPURTENANCES

3.1 Manholes

3.1.1 General

Under this section of the Specifications all manholes and their appurtenances including frames and lids shall be constructed of one of the types shown on the Plans, dependent upon the largest size sewer pipe entering/leaving.

3.1.2 Frames and Covers

Manhole castings shall consist of cast iron frames and covers conforming to ASTM A48 and manufactured to the dimensions as shown on the Plans. The castings shall weigh not less than 350 pounds for non-traffic and 425 pounds in traffic areas. The covers must set neatly in the frame, with contact edges machined for even bearing and with tops flush with the frame edge. They shall have sufficient corrugations to prevent slipperiness and be marked in large letters as indicated "Sanitary Sewer" or "Storm Sewer" as applicable. Sanitary covers shall not be perforated. Frames and covers shall be Neenah or approved equal.

3.1.3 Precast Walls and Slabs

Precast reinforced concrete manhole' and catch basin walls shall be of tongue-and-groove type conforming to ASTM Standard C 478, Latest Revision, with a minimum concrete strength of 4000 psi.

Manhole inverts shall form a smooth half-pipe flow section. Precast wall sections shall be separated by a seal manufactured by Kent-Seal No. 2 or ConSeal CS-202 type flexible sealant or approved equal.

Precast top slabs for manholes subject to traffic shall conform to details shown on the Plans.

Precast top slabs for manholes not subject to traffic shall conform to ASTM Standard C-478, Latest Revision.

All precast slabs shall be clearly marked, "Traffic" or "Non-Traffic" and "Top" or "Bottom". Prior to use of reinforced concrete wall sections and slabs, shop drawings covering details of construction shall be submitted to and approved by the ENGINEER.

3.1.4 Steps

All steps shall be 1/2" grade 60 steel reinforced inside 1-1/8" minimum copolymer polypropylene plastic. All steps shall be placed on 16" centers.

3.2 Cradle and Encasement

3.2.1 General

The cradle or encasement, as required to support the sewer pipe, shall be of crushed stone or concrete and shall be installed as specified in Section 4.

3.2.2 Crushed Stone Cradle

In all cases where the bedding is not specified, the sewer pipe is to be laid in crushed stone cradle. The crushed stone to be used shall be Kentucky Highway No. 9 Crushed Stone, as specified by the Kentucky Department of Highways Standard Specifications (Latest Revision).

3.2.3 Concrete Cradle, Encasement, or Cap

Where a concrete cradle is required as additional support for the sewer pipe, or where a concrete encasement or cap is concrete as specified in Section 4 of these Specifications, Section 601 of Kentucky Department of Highways Standard Specifications, shall be used. The pipe shall be laid and supported in accordance with the Specifications for pipe on a concrete cradle, as heretofore specified, and the concrete deposited around the pipe at the required width and depth to a plane at least 6 inches over the top of the pipe, as indicated on the plans. Proper bracing of the pipe shall be provided to prevent its being floated by the concrete encasement.

3.2.4 Branches and Fittings

Branches and fittings shall be provided and laid as and where directed. T-branches and Y-branches, placed in the sewer for property service connections, shall be located by the CONTRACTOR, and as directed by the ENGINEER; at such points in the sewer so as to result in the property service connection having the shortest length possible between the sewer and property line or easement line, unless otherwise indicated on the Plans or directed by the ENGINEER. All connections not put into service immediately shall have a removable PVC or DI plug or cap installed in the line.

3.2.5 Concrete Thrust/Anchor Blocks

Concrete thrust blocks shall be provided to prevent movement of pipe or appurtenances in response to the forces developed by the pressure of the piping system. In general, thrust blocking shall be provided where the pipeline changes direction (e.g. tees, bends,

elbows, crosses, etc.), changes size (e.g. reducers), stops at dead ends, and/or has an appurtenance (e.g. valve or hydrant) attached at which thrust develops when closed. Thrust blocks shall be sized accordingly to the detail Drawings.

3.3 Sewage Air Release / Vacuum Valve Assembly

Air Release / Air Vacuum valves shall be fully automatic float operated valves designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry. The valve shall re-open during draining or if a negative pressure occurs.

Valve 3-inches and smaller shall have full size NPT inlets and outlets equal to the nominal valve size. The body inlet connection shall be hexagonal for a wrench connection. Valve sizes 4-inch and larger shall have bolted flange inlets with threaded or plain outlets and protective hoods to prevent debris from entering the valve. Flanges shall be in accordance with ANSI B16.1 for Class 125 or Class 250 iron flanges and ANSI B16.5 for Class 150 or Class 300 steel flanges. The valve shall have two additional NPT connections for the addition of Air Release Valves, gauges, testing and draining.

The Valve body, cover and baffle shall be constructed of ASTM A126 Class B cast iron for Class 125 and Class 250 valves. Class 300 ductile iron valves shall be constructed of ASTM A536 Grade 65-45-12 ductile iron. Class 300 steel valves shall be constructed of ASTM A216 Grade WCB cas steel. The float, guide shafts and bushings shall be constructed of Type 316 Stainless Steel. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N. Class 300 steel valves shall have a 316 Stainless Steel Seat with Buna-N seal to provide an initial contact to Buna-N with final metal to metal contact to prevent over compression of the resilient seal. The valves are to be manufactured by Val-Matic or approved equal.

The inlet size, outlet size, venting orifice size, and maximum working pressure shall be as specified by the manufacturer, subject to approval by the Engineer, for the piping system in question.

Two (2) flush valves and a minimum of 5 feet of rubber hose with quick disconnects for back-flushing shall be provided. The manufacturer shall certify venting capacity and provide installation and maintenance manuals with each valve.

Assemblies shall be installed within a six foot diameter concrete manhole section as shown on the plans unless otherwise directed by the ENGINEER.

3.4 Tracer Wire

No. 10 Insulated Copper Tracer Wire shall be installed and included in the price per foot of installed sewer lines. 1,000-foot rolls shall be used to minimize the number of splices and reconnections. Where reconnections of the tracer wire are necessary, wire nuts will be used and filled with and RTV sealant. At approximately 1,000-foot intervals or the nearest meter or valve in the vicinity, the tracer wire shall be stubbed out.

4. PIPING WORKMANSHIP AND CONSTRUCTION METHODS

4.1 General

This section shall include all clearing and grubbing, site preparation, excavation of earth and other materials, filling, site restoration and grading, and other allied work necessary for the construction required for the project.

Any construction methods not specifically outlined in these Specifications will be governed by the Kentucky Department of Highways Standard Specifications (Latest Revision).

4.2 Maintenance of Public Travel

Maintenance of all traffic shall be in accordance with any requirements of the CITY, COUNTY and/or the Kentucky Department of Transportation. It is the responsibility of the CONTRACTOR to coordinate all work with and notify the above-named agencies, and to provide all necessary signs, barricades, lights, flagmen, and other items for maintenance of traffic.

Public travel shall be maintained, unrestricted, wherever and whenever possible. Detours shall be provided when so directed by the appropriate agency. Adequate precautions shall be taken to provide for the safety of both vehicular and pedestrian traffic. Emergency vehicles shall be provided access to the construction area at all times.

Unless specifically directed otherwise by the ENGINEER, not more than five hundred (500) feet of trench shall be opened ahead of the pipe laying, and not more than five hundred (500) feet of open ditch shall be left behind the pipe laying. All barricades, lanterns, watchmen, and other such signs and signals as may be necessary to warn the public of the dangers in connection with open trenches, excavations and other obstructions, shall be provided by and at the expense of the CONTRACTOR.

When so required, or when directed by the ENGINEER, only one-half (1/2) of the street crossings and road crossings shall be excavated before placing temporary bridges over the side excavated, for the convenience of the traveling public. All backfilled ditches shall be maintained in such manner that they will offer no hazard to the traveling public and the property owners abutting the improvements shall be taken into consideration. All public or private drives shall be promptly backfilled or bridged at the direction of the ENGINEER.

Excavated materials shall be disposed of so as to cause the least interference, and in every case the disposition of excavated materials shall be satisfactory to the ENGINEER.

4.3 Site Preparation

Prior to commencing construction operations, the CONTRACTOR shall make all the provisions necessary to assure the protection of all existing improvements. He shall protect trees, shrubs, plantings, and grassed areas and shall make provisions for maintaining travel in an acceptable manner.

Before any excavation is started, adequate protection shall be provided for all lawns, trees, shrubs, landscape work, fences, sidewalks, hydrants, utility poles, streets, alley and driveway paving, curbs, storm sewers, ditches, headwalls, catch basins, surface inlets and all other improvements that are to remain in place. Such protection shall be provided as long as necessary to prevent damage from the CONTRACTOR'S operations. Shrubs, bushes, small trees and flowers, which have to be removed to permit excavation, shall be protected and replanted or replaced when the backfill is complete to make as good or better than existing.

The CONTRACTOR shall exercise every precaution to prevent damage to property. He shall remove all debris and rock from the site and restore the ground surfaces, replace or repair all driveways, buildings, fences, retaining walls, etc. which are removed or damaged during construction unless specifically specified or designated otherwise on the Drawings.

The CONTRACTOR shall make provisions for handling all flows in existing ditches, sewers and trenches by pipes, flumes or other approved methods at all times when his operations would, in any way, interfere with the natural functioning of said ditches, sewers and drains. The CONTRACTOR shall at all times during construction provide and maintain sufficient equipment for the disposal of all water which enters the excavation, both in open cut trenches and in tunnels, to render such excavation firm and dry, until the structures to be built thereon are completed.

4.4 Excavation

Materials of excavation shall be unclassified and shall include whatever materials are encountered to the depth on the Plans, stated in the Specifications, or as directed by the ENGINEER. There will be no additional payment for solid rock excavation.

Excavated materials which are either surplus and not required or are unsuitable for backfilling shall be removed from the site of operations as soon as excavated.

All excavated materials so removed shall be disposed of, at no additional cost to the OWNER, on sites acquired by the CONTRACTOR and approved by the ENGINEER.

Excavated materials suitable and required for backfill shall be stored in neat piles adjacent to the excavation in a manner so as to interfere as little as possible with traffic, but shall not be placed at such heights above or closeness to the sidewalls of the excavation to endanger such operations due to slides or cave-ins.

In excavation for masonry and concrete structures, the required width shall be such as to permit forms to be constructed in the proper manner and to permit proper backfilling on completion of the structures.

Depth of excavation for footings shall be as shown on the drawings and/or as directed by the ENGINEER to obtain sufficient bearing.

Open cut excavation, either in earth or rock, shall be safely supported and of sufficient width and depth to provide adequate room for the construction or installation of the work to the lines and dimensions called for by the Plans.

Before laying the pipe, the trench shall be opened far enough ahead to reveal obstructions that may necessitate changing the alignment of, the pipeline.

Trench Dimensions - Excavations for pipe in both earth and rock shall have a minimum allowance trench width as shown on the details which will permit good workmanship in laying the pipe and fittings, boring and jacking and compaction of backfill at the sides of the pipe, and shall be subject to approval of the ENGINEER.

Subgrade - The depth of excavation below the pipe shall be 6" unless otherwise stated in the Plans and Specifications or approved by the ENGINEER.

The CONTRACTOR shall furnish, place, and maintain adequate sheeting and bracing as may be required to support the sides of the excavation and prevent any movements of earth which could, in any way, diminish the width of the excavation to less than that necessary for proper construction, cause damage to sewer lines, water line or structures, utilities, pavements or walks, or cause injury to workmen or others through movement of the adjacent earth banks, or to otherwise damage or delay the work.

The design and installation of all sheeting, sheet piling, bracing and shoring shall be based on computations of pressure exerted by the materials to be retained under existing conditions. Adequate and proper shoring of all excavations shall be the entire responsibility of the CONTRACTOR, however, the ENGINEER may require the submission of shoring plans (accompanied by supporting computations) for approval prior to the CONTRACTOR undertaking any portion of the work.

Whenever the excavation is carried beyond the lines and grades designed by the ENGINEER, the CONTRACTOR at his own expense shall refill such excavated with such material and in such a manner as will insure stability of the structure involved.

The CONTRACTOR, at his own expense, shall provide adequate facilities for promptly removing water from all excavations.

4.5 Blasting

Blasting is prohibited.

4.6 Backfill, Embankment, and Grading

This section includes the filling of the excavated trenches and spaces around the completed structures or pipelines to the original grades or to finished grades as indicated on the Plans.

The following materials shall be used to backfill any trenches so designated and in any situation shown on the Plans where such materials are specified.

Crushed Stone:

Crushed stone shall conform to Kentucky Bureau of Highways Standard Specifications (Latest Edition) Section 805, and shall be of the size and type as indicated on the Plans or Specifications.

Selected Excavated Materials:

Backfill in trenches for sewer lines, service connections, and structures outside the limits of existing or proposed paved surfaces, and in other specified locations shall be made with selected excavated materials taken from the trench excavation. The Plans and Technical Specifications shall govern the makeup of this material.

Backfilling of trenches in open cut shall be commenced as soon as possible after the sewer is laid and the jointing and alignment are approved, but not until authorized by the ENGINEER.

Selected excavated material containing no rock shall be carefully and solidly tamped around the pipe from the top of the cradle or encasement up to a plane at least one (1) foot above the exterior of the pipe or structure. The filling of the trench shall be carried on simultaneously on both sides of the pipe in such a manner that the completed pipe line will not be disturbed and injurious side pressures do not occur. Walking or working on the completed pipe line, except as may be necessary in tamping or backfilling, shall not be permitted, until the trench has been back filled to that height.

The CONTRACTOR may use any type of earth moving equipment he has at his disposal, provided such equipment is in satisfactory condition, and of such type and capacity that the work may be accomplished properly, the grading schedule maintained, and the required density obtained. Any questionable suitability problems relating to earth moving equipment shall be resolved by the ENGINEER.

The selected excavated backfill materials used between the plane one (1) foot above the top of the pipe and the ground surface may include rock fragments taken from the excavation when outside of existing or proposed paved areas.

In backfill containing rock, no rock fragment shall be larger than 1/2 cubic foot in size and all rock fragments shall be mixed with sufficient earth materials to completely eliminate all voids, subject to the approval of the ENGINEER. The amount of rock in the backfill shall not exceed 33% of the total backfill. Rock fragments and surplus earth materials not used in the backfilling shall be removed from the site of the work.

In backfilling around manholes and other structures, sandy backfill material or selected excavated materials containing no rock shall be placed in uniform layers and shall be thoroughly tamped and compacted.

Before final acceptance, the CONTRACTOR will be required to level off all trenches where backfill material has been piled up, or to bring the trench up to the level of the surrounding street, roadway, or terrain where necessary, also, the removal from the streets, roadways, and private property of all excess earth or other materials.

In areas where street paving is to be replaced, trenches shall be backfilled up to one (1) foot above the top of pipe or structure using No. 9 crushed stone. Backfill above this level shall be excavatable flowable fill (see Concrete Specification) to a level six (6) inches below the existing road surface. The top six (6) inches shall be backfilled with Non-excavatable flowable fill (see Concrete Specifications) and screeded to match the existing roadway surface. See detail in plans. No. 9 crushed stone shall be placed around manholes or other structures up to one (1) foot above the pipe. The remaining backfill shall be flowable fill as stated above for trenches.

4.7 Pipework

4.7.1 General

The WORK covered by this section of the Specifications shall include, in general, installation of all sanitary sewer and other appurtenances as shown on the ENGINEER'S drawings or as required to provide the OWNER with a complete and satisfactory process piping system. The responsibility of providing special coatings, detailed lay-out drawings, storage areas, testing, reports, cleaning and special anchoring of all process piping shall be directed to the general CONTRACTOR as a part of this section of the Specifications.

After the trench is excavated to subgrade as specified, it shall be filled to the proper depth with crushed stone or concrete as specified to provide a firm and satisfactory bed, hereafter referred to as the cradle or encasement, for the entire length of the pipe barrel. Pipe of the designated class and required size shall be laid to form a closed joint with the next adjoining pipe, bringing the inverts continuously to the required depth of cover shown on the Plans. The pipe shall be laid in an upstream direction, with bells upstream, unless otherwise permitted or directed.

No walking on or working over the pipes after they are laid, except as may be necessary in placing and compacting the backfill, will be permitted until they are covered with backfill to a depth of one (1) foot.

The trench backfill shall be placed in accordance with Section 114.6 of these Technical Specifications.

4.7.2 Pipe Jointing and Cutting

In laying the sewer pipe to the alignment and depth on the Plans, the pipe shall be jointed in accordance with one of the following approved jointing methods.

All Ductile Iron Pipe Jointing: Ductile iron pipe shall be joined in the manner specified by the manufacturer to form a watertight joint.

Polyvinyl Chloride Pipe Jointing (Gasket Type): The assembly of the gasketed joint shall be performed as recommended by the pipe manufacturer. The elastomeric gaskets may be supplied separately or prepositioned in the bell joint at the factory. When gaskets are separate, use only gaskets which are designed for and supplied with the pipe. They shall be inserted as recommended by the manufacturer. After the pipes are aligned in the

trench and ready to be joined, all joint surfaces shall be thoroughly cleaned. Lubricant shall be applied as specified by the pipe manufacturer. The pipe joint shall be assembled wither by hand or with the use of bar and block. Mechanical equipment shall be used only at the direction of the manufacturer, as approved by the ENGINEER.

Polyvinyl Chloride Pipe Jointing (Solvent Weld-Type): Preparatory to making pipe joints, clean the surfaces of the portion of pipe to be jointed of dirt and foreign matter and then paint with factory made jointing lubricants, primers, adhesives and other materials in accordance with the pipe or joint manufacturer's recommendations. Place the jointing materials, fit, join, and adjust in a workmanlike manner to obtain water-tight joints. The pipe joint shall be assembled either by hand or with the use of bar and block. Mechanical equipment shall be used only at the direction of the manufacturer, as approved by the ENGINEER.

High Density Polyethylene Pipe Jointing: The assembly of the gasketed joint shall be performed as recommended by the pipe manufacturer. The elastomeric gaskets may be supplied separately or prepositioned in the bell joint at the factory. When gaskets are separate, use only gaskets which are designed for and supplied with the pipe. They shall be inserted as recommended by the manufacturer. After the pipes are aligned in the trench and ready to be joined, all joint surfaces shall be thoroughly cleaned. Lubricant shall be applied as specified by the pipe manufacturer. The pipe joint shall be assembled wither by hand or with the use of bar and block. Mechanical equipment shall be used only at the direction of the manufacturer, as approved by the ENGINEER.

4.7.3 Pipe Handling and Installation

All procedures for receiving, handling, storing, and installing pipe used in the project, unless specified in these Technical Specifications, shall be governed by the Standards listed below with the approval of the ENGINEER.

Ductile Iron Pipe - The manufacturer's printed instructions.

Polyvinyl Chloride Pipe - The manufacturer's printed instructions.

High Density Polyethylene Pipe - The manufacturer's printed instructions.

Pipe may be cut in any manner specified by the pipe Manufacturer, but only when authorized by the ENGINEER.

5. PIPELINE TESTING

5.1 General Description

Testing at the CONTRACTOR'S expense of all sanitary sewer lines by the methods listed herein may be requested by the ENGINEER at any time to determine whether or not there is excessive leakage and to assure that the section is substantially watertight.

5.2 Smoke Testing

The CONTRACTOR shall be fully and properly equipped for conducting a "smoke test" on all sewer lines to be constructed.

The smoke test will assist the CONTRACTOR in proving his work as construction progresses and show up faulty materials and workmanship. Where this can be done in advance before backfilling, it will afford the CONTRACTOR the opportunity of correcting the faulty work at much less cost than would be otherwise possible.

The smoke testing blower shall have a capacity of at least 1200 cfm. The smoke bombs shall produce a chemical reaction-generated, white to gray smoke, leaving no residue, and be non-toxic and non-explosive. Each shall be capable of producing 25,000 cubic feet of smoke per three (3) minutes.

The first manhole to manhole section of sewer laid, for each size of pipe and type of joint, shall be given a smoke test prior to the sewer being backfilled and when the sewer trench is dewatered to the bottom of the pipe being tested. When the materials being used and the CONTRACTOR'S installation methods have been proven satisfactory, subsequent smoke testing may be done after backfill has been placed at the CONTRACTOR'S option.

Before the job is accepted the smoke test shall be applied to all sewers and laterals laid. Such testing shall be done while the water level in trenches is below the bottom of the pipe to be tested and in not more than two sections between manholes at a time. All defective work, as so proven by the smoke test, shall be immediately repaired and retested until proven satisfactory.

Inspection in pipe laying and smoke testing shall in no way relieve the CONTRACTOR of the responsibility for passing subsequent leakage test.

5.3 Leakage Tests

A leakage test may be requested by the ENGINEER at any time to determine whether or not there is excessive infiltration or exfiltration and to assure that the sewer section is substantially watertight. The ENGINEER may order the CONTRACTOR to make leakage test of as many sections as may be necessary to determine whether the work complies with the criteria for the rate of leakage. A section shall consist of a reach from one manhole to the next manhole provided the manholes are at least 300 feet apart and preferably 400 feet. Leakage tests shall be conducted, and measurements made, for a minimum of one hour. These tests may be conducted over a longer period of time with no reduction in the rate of leakage.

Leakage Into the Sewer - Leakage into the sewer including manholes, shall not exceed a rate of 250 gallons per 24 hours per inch diameter per mile of sewer. There shall be no gushing or spurting streams entering the sewer or manholes regardless of the rate of infiltration.

5.4 Low Pressure Air Testing

If requested by the ENGINEER, the CONTRACTOR will at his expense provide the necessary equipment and labor for low pressure air testing of sewer lines in accordance with latest revision of ASTM F1417. Any sections of sewer failing to pass such tests shall be repaired and retested at the CONTRACTOR'S expense until proven satisfactory. All lines must be air tested prior to acceptance by the OWNER.

The section of line to be tested is plugged. Air, at low pressure is introduced into the plugged line. The line passes the test if the rate of air loss, as measured by pressure drop, does not exceed a specified amount in a specified time. Pressure drop may be determined by using the table or equation given below.

Minimum Specified Time Required for a 0.5 psig Pressure Drop for Size and Length indicated for $Q = 0.0015$

Note- Consult with pipe and appurtenance manufacturer for maximum test pressure for pipe size greater than 30 inches in diameter.

Pipe Diameter, inches	Minimum Time, min:s	Length for Minimum Time, ft	Time for Longer Length, s	Specification Time for Length (L) Shown, min:s							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	1:53	597	0.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	0.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3:47	298	0.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	28:11	30:32	34:54	39:16
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:18	50:30	57:42	64:54
30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23

Calculate all test times by the following formula:

$$T = 0.085 DK/Q$$

Where:

T= shortest time allowed for the air pressure to drop 1.0 psig, s,

K= 0.000419 DL but not less than 1.0,

Q= leak rate in cubic feet/minute/square feet of internal surface = 0.0015 CFM/SF,

D= measured average inside diameter of sewer pipe (see Method D 2122 and Practice D 3567), in., and

L= length of section, ft.

5.5 Pressure Pipeline Testing

The CONTRACTOR shall pressure test the force main and/or air main after the installation of the pipeline has been completed. The testing shall be done with air and/or water and shall be pressure tested to 1.5 times the design pressure rating of the pipe. The segments of pipeline to be tested shall be as directed by the ENGINEER. The allowable leakage shall be measured as:

$$L = \frac{SD(P)^{1/2}}{133200}$$

in which L is the allowable leakage in gallons per hour; S is the length of pipe tested in feet; D is the nominal diameter of the pipe in inches and P is the test pressure in pounds per square in gauge.

For all process gravity ductile iron piping, a hydrostatic pressure test shall be performed. The test pressure shall be 50 psi for 3 hours with the allowable leakage being based on the above equation. The pressure testing shall be accomplished per the pipe manufacturer's printed instructions and/or PPI(Plastics Pipe Institute) Technical Report TR-31/9-79, "Underground Installation of Polyolefin Piping".

In preparation of testing, the CONTRACTOR shall alert the RESIDENT ENGINEER of his intentions to pressure test at least two days before doing so. During pressure testing the CONTRACTOR shall insure that the RESIDENT ENGINEER or a representative of his be present before and after each of the two phases of testing. It is imperative that the CONTRACTOR work in conjunction with the RESIDENT ENGINEER during the pressure test. The RESIDENT ENGINEER has the authority to declare a pressure test unacceptable for whatever reasons he deems necessary. Also, no testing shall be done on any day preceding a nonworking day or initiated after 3:00 pm of any working day.

5.6 Manhole Vacuum Testing

Sanitary Sewer Manholes shall be tested after installation with all connections in place.

1. Lift holes, if any, shall be plugged with an approved, non-shrinkable grout prior to testing.

2. Drop connections shall be installed prior to testing.
3. The vacuum test shall include testing of the seal between the cast iron frame and the concrete cone, slab or grade rings.
4. Manhole vacuum testing shall be performed after all adjacent underground utilities have been installed and all manholes have been backfilled and finished to final grade. Upon request of the CONTRACTOR, manhole vacuum testing may be performed prior to installation of adjacent utilities, after all manholes have been backfilled and finished to final grade and after the sewer leakage testing has been completed, with the following special condition: All manholes found to have been damaged or disturbed prior to the final (one-year) inspection shall be corrected and vacuum tested at that time, regardless of whether or not they were originally vacuum tested.
5. If a coating or lining is to be applied to the interior of the manhole the vacuum test must not be performed until the coating or lining has been cured according to the manufacturer's recommendations.
6. If existing manholes are to be vacuum tested (e.g. in the case of a sewer rehabilitation project), the ENGINEER and CONTRACTOR must deem the manhole structurally sound prior to vacuum testing.

C. Procedure for testing shall be as follows:

1. Temporarily plug all pipes entering the manhole. Each plug must be installed at a location beyond the manhole/pipe gasket (i.e. outside the manhole wall), and shall be braced to prevent the plug or pipe from being drawn into the manhole.
2. The test head shall be placed inside the rim of the cast iron frame at the top of the manhole and inflated, in accordance with the manufacturer's recommendations.
3. A vacuum of at least ten inches of mercury (10" Hg) shall be drawn on the manhole. Shut the valve on the vacuum line to the manhole and shut off the pump or disconnect the vacuum line from the pump.
4. The pressure gauge shall be liquid filled, having a 3.5-inch diameter face with a reading from zero to thirty inches of mercury.
5. The manhole shall be considered to pass the vacuum test if the vacuum reading does not drop more than 1" Hg (i.e. from 10" Hg to 9" Hg) during the following minimum test times.
6. If a manhole fails the vacuum test, the manhole shall be repaired with a non-shrinkable grout or other material or method approved by the ENGINEER. The manhole surfaces shall be properly prepared prior to any repairs. Once the repair material has cured according to the manufacturer's recommendations the vacuum test shall be repeated. This process shall continue until a satisfactory test is obtained.
7. All temporary plugs and braces shall be removed after each test.

Minimum Test Times for Various Manhole Diameters			
MH Depth (feet)	4' Diamete r MH	5' Diamete r MH	6' Diamete r MH
15 Feet or less	50 sec.	1 min. 5 sec.	1 min. 20 sec.
15.01 to 30 Feet	1 min. 20 sec.	1 min. 45 sec.	2 min. 10 sec.

TECHNICAL SPECIFICATIONS

SECTION C

CONCRETE

1. GENERAL

This section shall be used for all concrete work including but not limited to sanitary structures and appurtenances.

The CONTRACTOR shall provide all labor, materials, equipment and services required to form, furnish, place and finish all reinforced cast-in-place concrete work as shown on the Drawings, specified herein, or directed by the ENGINEER, including furnishing and placing all reinforcing steel and ties, waterstops, furnishing and installing precast concrete items as shown on the plans, installing all items to be built into concrete work, and repairing and patching existing concrete work which is required to be disturbed or altered in this contract.

2. CODES AND STANDARDS

In order to ensure that the Work to be performed under this section results in an acceptable product, the following codes and recommended standard practices shall be strictly adhered to except as hereinafter modified:

ACI 301-84 "Specifications for Structural Concrete for Buildings"

ACI 318-83 "Building Code Requirements for Reinforced Concrete"

ACI 304R-85 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete"

ACI 305R-77 "Recommended Practice for Hot Weather Concreting"

ACI 306.1-87 "Recommended Practice for Cold Weather Concreting" ACI 350R-83 "Concrete for Sanitary Structures"

ACI 347-78 "Recommended Practice for Concrete Formwork"

CRSI Manual of Standard Practice 1976

3. REFERENCES

The CONTRACTOR shall obtain and have available in the field office at all times, the following references:

- 1) Specifications for Structural Concrete for Buildings ACI Publication SP-15 (84), Field Reference Manual (includes ACI 301-84 and selected references)

Available from: The American Concrete Institute
Publications Department
P. O. Box 19150
Detroit, Michigan 48219
(313) 532-2600

2) Manual of Standard Practice - CRSI (73)

3) Placing Reinforcing Bars - CRSI

Available from: Concrete Reinforcing Steel Institute
933 North Plum Grove Road
Schaumburg, Illinois 60195
(312) 490-1700

4. CONCRETE MATERIALS

4.1 Cement (ACI 2.1)

Cement shall be Portland Cement Type I or II (ASTM C 150). The cement shall contain less than 8 percent (8%) Tricalcium Aluminate (C3A). Certification shall be furnished for all cement in addition to mill test reports on periodic shipments.

4.2 Admixtures (ACI 2.2)

An air entraining admixture (Darex, AEA, Protex, RIW Toxement AEA or approved equal) shall be used in all concrete and shall meet the requirements of ASTM C 260. Certification attesting to the compliance of the material with ASTM C 260 shall be furnished.

Other admixtures such as set controlling water reducing admixtures, pozzolans, densifiers, set retarders, etc. may be used with the written permission of the ENGINEER, except that under no circumstances shall calcium chloride be used.

4.3 Water (ACI 2.3)

Water shall be kept free from injurious amounts of oil, acid, alkali, organic matter or other such deleterious substances. Particular attention shall be paid to conformance to the provisions of ACI 3.4.4, ACI 3.7.2, and ACI 350R Par. 3.2 concerning chloride concentrations (maximum water soluble chloride content expressed as a percent by mass of the cement and measured at the level of the steel shall be less than 0.15 per cent).

4.4 Fine Aggregate (ACI 2.4)

Fine aggregate shall consist of natural sand having clean uncoated grains, free from injurious amounts of clay, flaky material, lignite, organic material and other such foreign substances and shall meet the requirements of ASTM C 33.

4.5 Coarse Aggregate (ACI 2.4)

Coarse aggregate shall be crushed stone, gravel or slag having clean, hard, uncoated particles. It shall be free from injurious amounts of soft, friable, thin, elongated or laminated pieces and shall meet the requirements of ASTM C 33. Coarse aggregate shall be size number 57 or size number 67 as set forth in ASTM C 33.

5. PROPORTIONING

5.1 General

Proportions for concrete shall be selected to produce concrete of the specified workability, durability, density, and strength. Proportions shall be selected in accordance with ACI 3.8 and

ACI 3.9 or ACI 3.10 and in accordance with ACI 211.1-81, "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete". Documentation of the resulting concrete mix designs, including testing as required shall be in accordance to the aforementioned ACI paragraphs and shall be submitted to the ENGINEER for review and approval.

5.2 Strength (ACI 3.2)

All concrete shall have a minimum compressive strength of 4000 lbs/sq. in. at twenty-eight (28) days.

5.3 Air Content (ACI 3.4.1.)

Air content shall be six (6) percent, +/- one (1) percent by volume.

5.4 Slump (ACI 3.5)

Slump shall be in accordance with ACI Section 3.5 (4-maximum) for all concrete.

5.5 Maximum Size of Coarse Aggregate (ACI 3.6)

Coarse aggregate shall be Size No. 57 (1 inch nominal maximum) or Size No. 67 (3/4 inch nominal maximum) conforming to ASTM C 33 as herein before specified.

5.6 Selection of Proportions (ACI 3.8)

In summary, the concrete mix shall be proportioned in accordance with ACI 3.8 and ACI 3.9 or ACI 3.10 to meet the following specifications.

4000 psi compressive strength at 28 days.

Type I or Type II cement (cement dispersing agent permitted; Tricalcium Aluminate (C3A) content less than 8%

Maximum water/cement ratio = 0.45

Minimum cement content - 564 lbs. (6 bags/cubic yard concrete)

Maximum size coarse aggregate = No. 57 (1 inch nominal maximum)

Air content = 6 per cent +/- 1 percent by volume.

Slump = 3" to 4" in accordance with ASTM C 143.

Maximum water soluble chloride content =0.15 per cent by mass of cement and measured at the level of the steel.

6. REINFORCEMENT

6.1 General

Prior to ordering reinforcing steel/ the CONTRACTOR shall furnish the ENGINEER shop drawings showing a complete schedule of the bars and the fabrication that is required and shall have the approval of the ENGINEER before fabrication per ACI 5.1.

6.2 Deformed Bars and Welded Wire Fabric

Reinforcing steel shall meet the requirements of ASTM A 615, Grade 60. Welded wire fabric

(ACI 5.2.5) shall meet the requirements of ASTM A 185 of the size indicated on the Drawings, and shall be furnished in flat sheets only. The concrete shall be placed up to the level of the reinforcing fabric position; then the flat sheet of wire fabric shall be placed on the wet concrete; then the remaining wet. concrete topping shall be added and vibrated into the base pour in accordance with ACI 5.5.5.

The welded wire fabric may be supported in position on the ground with masonry blocks as described in ACI 5.5.3, subject to the approval of the ENGINEER. No other method of placing the wire fabric is acceptable.

Reinforcing for slabs and beams shall be supported in the forms by factory-made wire bar supports, "Class A", furnished and installed in accordance with BAR SUPPORT Specifications section of the Manual of Standard Practice as published by Concrete Reinforcing Steel Institute, Chicago, Illinois.

6.3 Placing Reinforcement

Reinforcement shall be placed in accordance with ACI 5.5. Before any concrete is placed, the ENGINEER shall have inspected the formwork and placing of the steel reinforcement and given permission to deposit the concrete. Concrete placed in violation of this provision will be rejected and thereupon removed.

7. JOINTS AND EMBEDDED ITEMS

7.1 Construction Joints

Construction joints shall be in accordance with ACI 6.1. All joints subject to hydrostatic pressure shall be provided with continuous waterstops. Construction joints shall be located as shown on the plans unless otherwise approved or directed by the ENGINEER. Construction joints shall be keyed except as specifically shown in the plans as "roughened" construction joints (ACI 6.1.4.3)

7.2 Preformed Expansion Joint Filler (ACI 6.2.2.)

Where required, joint filler material shall be preformed non-extruding resilient bituminous type conforming to the requirements of ASTM D 1751.

7.3 Waterstops (ACI 6.3.)

Continuous waterstops shall be provided in all construction and/or expansion joints in liquid containing structures. Other locations for waterstops shall be as shown on the Drawings or where directed by the ENGINEER. Waterstops shall be made continuous around the entire structure or throughout the depth of the joint.

Waterstops shall be extruded from an elastomeric polyvinyl chloride compound with a minimum tensile strength of 2000 psi + 50, and shall not contain any scrap or reprocessed materials. Waterstops shall be 6" wide with a 3/16" web thickness; serrated split with center bulb are to be used in expansion joints and dumbbell type are to be used in construction joints as shown on the plans. They shall be securely wired in place to maintain proper position during concrete placement. All field splices shall be heat fused with a thermostatically controlled electric heat source as recommended by the manufacturer.

All materials shall be Greenstreak Plastic Products Company products (St. Louis, Missouri), or approved equal, and shall be installed in accordance with the manufacturer's recommendations.

7.4 Built-in-Items

The CONTRACTOR shall be responsible for placing all sleeves, wall castings, anchor bolts, and

other inserts in the concrete work in their proper positions. CONTRACTOR shall verify that all such inserts to be embedded are in place prior to placing of concrete. The embedment of aluminum conduit in concrete construction will not be permitted.

8. PRODUCTION AND PLACING OF CONCRETE

8.1 General

Production and placing of concrete shall conform to the provisions of ACI Chapter 7 and ACI Chapter 8, and to the "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete" ACI 304-73. In addition, the ENGINEER shall inspect and approve the proposed concrete production facility well in advance of any concrete placing operations.

8.2 Transporting Concrete

Concrete shall be conveyed from the mixing site to the placing site in accordance with ACI 8.2 with the exception that nonagitating trucks shall not be used for transporting "Ready-mixed" concrete. In all cases, concrete shall be delivered to the placing site within 1 1/2 hours, or before the mixing or agitating drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the other ingredients per ASTM C 94.

8.3 Hand Mixing

Hand mixing concrete will not be permitted except in case of emergency and only at the specific direction of the ENGINEER.

8.4 Retempering

Retempering concrete will not be permitted except in case of emergency and only at the specific direction of the ENGINEER.

8.5 Weather Conditions

8.5.1 Cold Weather (ACI 7.6.1)

All methods and materials used for cold weather concreting shall be in accordance with the requirements of recommended practice for "Cold Weather Concreting" (ACI 306R-78), and shall be subject to the approval of the ENGINEER.

8.5.2 Hot Weather (ACI 7.6.2)

All methods and materials used for hot weather concreting shall be in accordance with the requirements of recommended practice for "Hot Weather Concreting" (ACI 305R-77), and shall be subject to the approval of the ENGINEER.

9. CURING AND PROTECTION

9.1 General

Concrete shall be cured by the methods set forth in ACI 12.2 and the "Standard Practice for Curing Concrete" (ACI 308-81). The use of membrane curing compounds is permitted as specified in ACI 12.2.1.7 for areas where such use will not interfere with the finishing operations or impair the finish specified for the concrete. Under no circumstances shall membrane curing compounds be used on any surface against which additional concrete, grout, or other material is to be bonded, for example tank bottoms which will receive a grout topping. Clear membrane curing compounds used shall contain a fugitive dye to aid in verifying proper application and shall be applied in accordance with the manufacturer's recommendations.

10. Precast Concrete

Precast concrete items shown in the plans shall be manufactured at an approved precast/prestressed concrete production facility. The CONTRACTOR shall be responsible for all materials, labor, bearing devices, joint seals, embedded items, etc. necessary to furnish and install the precast concrete work as shown on the plans or otherwise specified.

Materials and installation shall conform to all applicable provisions of the Specifications as hereinbefore set out.

Precast pump stations and wet wells shall be designed to withstand internally applied hydrostatic forces as well as externally applied soil and water pressure assuming that the normal groundwater table is at 1 foot below finished grade. The design shall conform to the applicable provisions of ACI 318-83, "Building Code Requirements for Reinforced Concrete" and ACI 350R-83, "Concrete Sanitary Engineering Structures". Positive means of sealing joints between individual sections shall be provided to prevent leakage into or out of the finished structures, and the CONTRACTOR is hereby reminded that the water tightness provisions of Section III 7.3 apply to this work.

Shop plans shall be submitted to the ENGINEER and approval received prior to Fabrication.

11. Flowable Fill

11.1. Flowable fill will consist of a mixture of Portland cement, fly ash, fine aggregate, air entraining admixture and water. Flowable fill is intended to contain a low cementitious content for reduced strength development.

11.2. Flowable fill is available in either Excavatable or Non-Excavatable proportions as specified by the ENGINEER. The following table lists mix design proportion ranges for both types of flowable fill.

Mix Design For Flowable Fill

	Excavatable		Non-Excavatable
	Air Entrained	Non-Air Entrained	
Type 1 Portland Cement*	50-100 lbs/yd ³ **	20-40 lbs/yd ³ **	75-150 lbs/yd ³ **
Fly Ash	0-600 lbs/yd ³	250-600 lbs/yd ³	150-600 lbs/yd ³
Water	See Note 1	See Note 1	See Note 1
Air***	15-35%	N/A	5-20%
28-day compressive Strength***	150 psi maximum	150 psi maximum	150 psi minimum
Unit Weight Wet	90-100 lbs/ft ³	90-125 lbs/ft ³	100-125 lbs/ft ³

Note 1. – Select water content as necessary to produce a consistency that will result in a flowable, self-leveling product at the time of placement.

*Other types of Portland cement meeting the requirements of Division 700 may be used with prior approval of the Structural Materials Engineer.

**When using less than 75 lbs/yd³ of Portland cement, the combined quantity of Portland cement and fly ash must be at least 100 lbs/yd³.

***The requirements for air, 28-day compressive strength, and unit weight are for laboratory design only and are not jobsite acceptance requirements.

TECHNICAL SPECIFICATIONS

SECTION D

RESTORATION OF GROUND SURFACES AND CLEANUP

1. GENERAL

All ground surfaces in public rights-of-way, easements and on private property that have been damaged or destroyed by the CONTRACTOR'S operation shall be restored to original contours or as shown on the plans, and in accordance with the following Specifications.

2. RESTORATION OF GRASSED AREAS FOR THE SANITARY SEWER SYSTEM

The CONTRACTOR shall seed and mulch all disturbed areas, unless otherwise specified, in the following manner:

Rye Seeding - The ground shall be loosened approximately 3 inches deep with a disc or harrow; fertilized with 25 pounds of 10-10-10, or equivalent, and 100 pounds of agricultural lime per 1,000 square feet, sown at a rate of 5 pounds per 1,000 square feet with a mixture of 25% perennial rye, 25% Kentucky bluegrass and 50% Kentucky No. 31 fescue grass seed. The seed shall be well raked or boarded into the soil.

The time of application of the seed and fertilizer shall be at the discretion of the Engineer.

Unless otherwise permitted by the Engineer, vegetable materials or mulching, shall be wheat, oat barley or rye straw only. All material shall be reasonably free from weed seeds, foreign material, and other grasses and chaff, and shall contain no Johnson Grass. The straw shall be reasonably bright in color and shall not be must, moldy, caked or of otherwise low quality. It shall be dry on delivery.

Unless otherwise specified, the bituminous material to be used for "tying down" straw mulch shall be a slow setting emulsified asphalt. It shall be non-toxic to plants.

Mulch net shall be used, if directed by the Engineer, to hold mulch in place until turf is established. The net shall be made of a tightly twisted kraft paper yarn, leno woven with a warp count of one pair of yarns per 2 inches and a filling count of 2 per inch. Salvage edges and center shall be reinforced with polyethylene filament. The material shall have a minimum width of 45 inches.

TECHNICAL SPECIFICATIONS

SECTION E

SOLIDS HANDLING PUMP STATION

PUMPING STATION (General)

Scope of Work

The Contractor shall furnish all labor, materials, equipment and services for manufacturing, assembling, delivering, installing, testing and placing in service sewage pumping station including pumps, motors, controls, basins and appurtenances.

Definitions

When the term "pumping unit" is used, it shall be deemed to mean a pump or pumps, complete with, but not limited to, drive motor, accessories, appurtenances and all associated equipment.

Contract Drawings

The contract drawings are intended to show a general arrangement of pumping equipment, controls, connected piping and valves. The pump manufacturer shall furnish each pumping unit complete with motor and all components necessary for the intended function of the unit and shall be held entirely responsible for the compatibility of all components furnished

Manufacturer

All pumping units shall be an approved design, make and products of manufacturers who have built equipment of similar type, size, and capacity.

The contractor shall submit, upon request, any additional information that the Engineer and/or owner may deem necessary to determine the ability of the proposed manufacturer to produce the specified equipment.

Pumping units shall be products of manufacturers who can produce evidence of their ability to promptly furnish any and all interchangeable replacement parts as may be needed at any time within the expected life of the pumps.

Approval of manufacturers or suppliers will not be given until all information required by the specifications or requested by the Engineer has been submitted and found acceptable.

The Contractor shall provide at no cost to the Owner, the services of an accredited representative of the pump manufacturer who shall supervise the installation and testing of each pumping unit and also give operating and maintenance instruction to the Owner's personnel. Pumping equipment shall be tested for performance according to curves and other approved data. Failure of the equipment to perform as curves indicate and with other approved data shall be sufficient cause for rejection. As one condition necessary to acceptance of any pumping unit, the contractor shall submit a certificate from the manufacturer, stating that the installation of the pumping unit is satisfactory, that the unit is ready for operation, and that the Owner's operating personnel have been suitably instructed in the operation and maintenance of the unit.

Submittals (Shop Drawings)

The Contractor shall comply with the provisions of the Specifications regarding submittals. The following shall be included in submittals as a minimum. However, any additional information or data shall be added if and whenever requested by the Owner or Engineer. Separate data for each pumping unit shall be submitted.

Content of Submittals

Submittals shall contain descriptive literature as to dimensions and materials of construction. Performance data shall include size of pump, GPM, TDH, BHP, pump efficiency (inlet through discharge head), RPM, performance curves, shutoff head, weight of complete motor/pump as a unit and discharge diameter.

Installation information shall include drawings and information necessary for connecting piping and valves, electrical connections, starting and auxiliary equipment. Submit drawings showing dimensions and scaled assembly outline of the complete pump and all associated equipment. Such drawings shall show plan, elevation and any other views or sections requested. For all pumping units, a scaled cross-sectional drawing of the assembled pump showing full details, parts list of all items and materials of construction shall be submitted for approval.

A scaled drawing of the pump station top slabs shall be supplied showing the exact location of all hatches, vents, and internal wet well piping to be certain that all equipment will properly fit and can be installed and/or removed without undue effort. This drawing shall clearly show location of hinge side of hatch and an exact location of the hoist sockets to insure that each pump can be pulled in a perfectly vertical fashion. The Contractor shall submit all other drawings, and other information specified, requested, and/or necessary to show complete compliance with all the details of the contract documents.

The pump manufacturer shall submit an Operations and Maintenance Manual containing all information necessary for proper operation and maintenance of pumping units as well as location of the nearest permanent service headquarters. The Operations and Maintenance Manuals shall detail all aspects of the pumps, including dimensions of impeller/wear rings, clearances, model number/size of bearings, size of mechanical seals and related data. There shall be four (4) manuals submitted for each pumping station. These manuals must be submitted when pumps are delivered.

Submersible Non-Clog Pump Stations

General

All pumping units shall be designed and built for the specified operation without overheating, without excessive vibration or strain and requiring only generally acceptable maintenance.

The pumps shall be non-clogging sewage pumps capable of operating in a partially or entirely submerged condition. The design shall be such that pumping units will be automatically connected to the discharge piping when lowered into place on the discharge connection. The pumps shall be easily removable for inspection or service, requiring no bolts, nuts or other fastenings to be removed for this purpose and no need for personnel to enter the pump well. Each pump shall be fitted with a stainless steel chain of adequate strength and length to permit raising the pump for inspection and removal. Minimum chain size shall be 5/16".

All major parts, such as stator casing, oil casing, sliding bracket and volute shall be of gray iron. All surfaces coming into contact with sewage shall be protected by a coating resistant to sewage. All exposed nuts and bolts shall be of stainless steel. All openings in the pump impeller and volute case shall be large enough to pass a three (3) inch diameter sphere. The discharge flange shall be a 4" discharge flange / intake, as shown on the plans.

Motors

The pump motor shall be of the sealed submersible type. The stator winding shall be of the open type with insulation good for 180 degrees centigrade maximum temperature. The motor shall have two heavy duty ball bearings to support the pump shaft and take radial and thrust loads and a sleeve guide bushing directly above the lower seal to take radial load and act as flame path for the seal chamber. Ball bearings shall be designed for 30,000 hours B-10 life. Stator shall be heat shrunk into motor housing. SLIP FIT STATORS WILL NOT BE ACCEPTABLE. A heat sensor thermostat shall be attached to and imbedded in the winding and be connected in series with the motor starter contactor coil to stop motor if temperature of winding is more than 220 degrees F. The thermostat shall reset automatically when motor cools to safe operating temperature. Two heat sensors shall be used on 3 phase motors. The common pump, motor shaft shall be of 416 stainless steel.

Seals

The motors shall be protected by two mechanical seals mounted in tandem with a seal chamber between the seals. Seal chamber shall be oil filled to lubricate seal face and to transmit heat from shaft to outer shell. Upper seal face shall be carbon-ceramic and lapped to a flatness of one light band. Lower seal shall be tungsten carbide vs. tungsten carbide.

A double electrode shall be mounted in the seal chamber to detect any water entering the chamber through the lower seal.

Water in the chamber shall cause a red light to turn on at the control panel. This signal shall not stop the motor but shall act as a warning only, indicating service is required.

Impeller

Impellers shall be ductile iron, of a recessed, non-clog type. Impellers shall be dynamically balanced by grinding on shroud faces. No holes are to be drilled for balancing.

Pump Case

The volute case shall be cast iron and have a flanged centerline discharge. Discharge flange shall be as required on the plans and shall be standard with bolt holes straddling centerline. A bronze wear ring shall be pressed into the case for guiding impeller neck and to prevent corrosion freeze up. Wear ring is to be held from rotating by locking with stainless steel set screw.

Pump and Motor Castings

All castings shall be of high tensile cast iron and shall be treated with phosphate and chromate rinse. All fasteners shall be 302 stainless steel.

Bearing End Cap

Upper motor bearing cap shall be a separate casting for ease of mounting and replacement. All fasteners shall be stainless steel type 303.

Power Cables

Power cord and control cord shall be double sealed. The power and control conductor shall be single strand sealed with epoxy potting compound and then clamped in place with rubber seal bushing to seal outer jacket against leakage and to provide for strain pull. Cords shall withstand a pull of 300 pounds to meet U.L.

requirements. Power cords shall not be spliced, and run the full distance to the control panel. A 2' swag-loop of cable shall be installed in the well to allow for ample supply of cord to remove the pumps from the well.

Insulations of power and control cord shall be type SO or STOW. Both control and power cords shall have a green carrier ground conductor that attaches to motor frame. The pumps and motors shall be made by the same manufacturer and shall be designed to operate in a sewage pumping station pumping raw sewage.

Lift Out Rail System

Each lift out rail system shall consist of: a ductile iron discharge base, pump attaching and sealing plate, pump guide plate, and cast iron elbow. All exposed nuts, bolts, and fasteners shall be of 300 series stainless steel. No fabricated steel parts shall be used.

Sealing

A sealing plate shall be attached to the pump. A simple downward sliding motion of the pump and guide plate on the guide rails shall cause the unit to be automatically connected and sealed to the base. The open face of the sealing plate shall have dove-tailed groove machined into the face to hold a sealing "o"-ring. The "o"-ring shall provide a leak-proof seal at all operating pressures. NO LEAKAGE WILL BE ACCEPTABLE

Elbow

Discharge elbow shall be 4" x 4" and shall be integrally casted into the base assembly.

Guide Rails

Two rail pipes shall be used to guide the pump from the surface to the discharge base connection. The guide rail shall be 1 1/2 inch schedule 40 stainless steel pipe. The weight of the pump shall bear solely on the discharge base and not on the guide rails. Rail systems which require the pump to be supported by legs which might interfere with the flow of solids into the pump suction will not be considered equal. The guide rails shall be firmly attached to the access hatch frame. Systems deeper than 21 feet shall use an intermediate guide for each 21 feet of wet well depth.

Lifting Chain

An adequate length of 1/4" stainless steel lifting chain shall be supplied for removing the pump. The chain shall be of sufficient length and shall include an adequate number of lifting rings for easy removal. Length shall be 4' greater than the overall wet well depth. A stainless steel fabricated hook shall be provided for each chain. These hooks shall be secured to the hatch frame with stainless steel bolts and nuts before the hatch is cast into concrete.

Discharge Piping - Station Piping - Valves - Accessories

Piping within the station and external the station shall be flanged joint Class 53 cement lined ductile iron with proper bolts and gaskets. All concrete anchor bolts used for any part of this station installation shall be stainless steel. All flange bolts shall be stainless steel.

Top Rail Support Plates

One (1) each aluminum top rail support plate shall be provided for each installed pump. This plate shall be fabricated of aluminum plate and shall contain expandable rubber bushings to accept the 1 1/2" stainless steel guide rails. These rubber bushings when completely tightened shall provide for a tight, vibration free guide rail

installation. Notched openings in the rail support plates shall provide for horizontal adjustment. All fasteners shall be stainless steel.

Gravity Sewers

All gravity sewers entering the wet well shall be ductile iron for at least 1 full joint of pipe or to a point where they clear the pump station excavation. All gravity sewers shall extend 3" within the inside of the wet well. Non-shrink grout shall be used to seal all pipe penetrations within the wet well and valve vault.

Discharge Piping

All piping shall be installed plum and without strains or binds. Piping shall be properly supported. A minimum of two 2) mechanical joint long sleeves shall be used between the wet well and valve vault. Any fabricated pipe supports used shall be stainless steel or aluminum.

Gate Valves - Pump Discharge

All gate valves for pump discharge service shall be flanged A.W.W.A. type with resilient seat and hand wheel operators.

Pipe Fittings - Flanged

All flanged pipe fittings shall be cast iron, cement lined A.W.W.A. type. Flange bolts shall be stainless steel. All flange bolts shall be assembled using "Never Seeze".

Pipe Fittings - Mechanical Joint

All mechanical joint pipe fittings shall be ductile iron cement lined with restrained joint connections. All mechanical joint fittings shall be properly blocked as required.

Guide Rails

All guide rails shall be type 304, schedule 40 stainless steel.

Gauges & Gauge Taps

A minimum of three 3/4" N.P.T. taps shall be supplied in the valve vault as shown on the plans. Each tap shall be supplied with a type 304 stainless steel nipple and bronze ball valve. One (1) 3-1/2" diameter liquid filled gauge with stainless steel diaphragm seal shall be supplied. A tamper proof strap shall be installed between the gauge and seal to prevent the seal from being broken. Gauge shall be equal to U.S. GAUGE or approved equal. Gauge range shall be sized to allow gauge to operate in its mid range. A gauge protector shall be installed between the seal and gauge.

Access Hatches – Wet-well & Valve vault

There shall be furnished and installed, one (1) aluminum access hatches at the pump station, and 1 for the valve vault. Hatch shall be sized to allow removal of all pumping equipment. Hatch size shall be determined by the pump supplier to allow for proper pump removal clearances. The hatch shall be of non-skid design and designed to handle a weight of 300 pounds per square foot. A positive hold open bar shall be provided to secure the hatch in the open position. Stainless steel bolts for mounting each rail support plate shall be furnished so that each set of guide rails can mount directly to the access hatch.

All hinges and hinge bolts shall be stainless steel. All hinge bolt nuts shall be tack welded to prevent removal of bolts. All fasteners used on the hatches shall be non-corrosive. All areas of hatch frame that will be in contact with concrete shall be coated with bitumastic paint.

Valve Vault Drain

If shown on the plans, a 4" schedule 40 PVC drain shall be installed from the valve vault floor to an open drain. This drain line shall be properly laid to grade and bedded with stone. A 4" low head flap valve and head wall shall be installed as shown on the plans. Valve vault floor shall slope toward drain. In cases where a positive drain is not possible, then a gravel drain as shown on the plans shall be used.

Emergency Pump out Connection

The valve vault, shall be equipped with an emergency pump out connection, as sized by the city, and shown on the plan sheets.

Pump basins - Wet well

Pump station basins shall be precast reinforced concrete pipe in conformance with ASTM C478 (LR) constructed as shown on the drawings. The basin and interior piping shall be protective coated with coal-tar epoxy coating such as Tnemed "Hi-Build Tnemator or Koppers "Bitumastic 300M". Minimum diameters for valve vault and wet well are 6'0" inside diameter.

Controls

A NEMA 4X aluminum control panel shall be furnished and installed appropriate for the electrical characteristics of the pump station. Each panel shall contain a main circuit breaker for each pump, a magnetic IEC rated starter with quick trip ambient compensated overload relays in each phase, main circuit breaker for alarm and 115 volt control circuit, yellow run light for each pump, H-O-A switch for each pump, red seal failure light for each pump, alarm switch for on-off and test, outside flashing red alarm light, alarm horn with silence push button, alternator relay to alternate pumps on each successive cycle, with a lead pump selector switch, and override circuit to start all pumps if level rises in sump or to start a second pump if one pump fails. A separate alarm circuit shall be provided as well as a terminal strip for connecting pumps and controls. Panel to also include a duplex receptacle with GFI circuit breaker, power monitor for low voltage, loss of phase or phase reversal; condensation heater with thermostat, and elapsed time meters for each pump (non-reset). Panel to include auxiliary contacts for alarm signal for a remote mount alarm signal.

Control panel shall be designed and supplied for pedestal mounting and contain all required bolts, nuts, and cord grips. Panel is to be pedestal mounted, beside the wet-well by others.

Mounting Plate

There shall be furnished and installed on the panel prior to shipment one 1/2" thick aluminum mounting plate. These plates shall be drilled and tapped to accept 1/4" stainless steel mounting bolts for securing plate to panel and panel to pedestal. A sufficient number of gas tight cord grips for all cables shall be factory installed inside the control panel. Mounting plates shall be equal to U.S. FOUNDRY MP2AL.

Panel Mounting Pedestals

One (1) fabricated aluminum panel mounting pedestal shall be supplied for installation over 4" diameter holes in the wetwell top slab. Pedestal bottom flange shall be fabricated to accept four (4) 1/2" diameter stainless steel concrete anchor bolts and provide for a sturdy panel installation. Top flange on pedestal shall be flanged and drilled in eight (8) places for 1/4" bolts to allow for panel/mounting plate installation. One side of the pedestal shall have a removable gasketed door to allow for cable installation and removal. One side of the

pedestal shall be provided with an aluminum vent. All fasteners shall be stainless steel. Pedestals shall be equal to U.S. FOUNDRY Model F-66W24AL.

OPERATION SEQUENCE:

On sump level rise lower float switch shall be energized. When level rises to next float, float shall be energized and lead pump shall start. With lead pump operating, sump level shall lower to low level float turn-off setting and pump will stop. Alternating relay will index in stopping of pump so that lag pump will become lead pump on next operation. If sump level continues to rise when lead pump is operating, override float switch shall operate together until low-level float switch turns off both pumps. If level continues to rise when both pumps are operating, alarm floats switch will energize and signal alarm.

LEVEL CONTROLS:

Sealed mercury float switches shall be provided and installed. Four floats shall be required for duplex stations. Floats shall be attached to special mounting bracket near the top of the basin so that levels can be changed without entering the sump basins.

Identification Nameplate - Accessories

Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, and principal rating data. A second identical nameplate shall be provided for all submersible pumps and affixed to the control panel.

The Contractor shall furnish with each type, kind or size of pumping unit, two sets of any special suitably marked high- grade tools, gauges and fixtures which may be needed to adjust, operate, maintain or repair the equipment. Such tools and accessories shall be furnished in neat, special steel cases fitted with locks and keys and delivered to the Engineer prior to the initial operation of equipment.

Pump Station Warranty

The Contractor guarantees and warrants that during the first year of operation, (date the pump station is tested, placed in service and a written acceptance letter issued by the Owner) the pump stations will operate satisfactorily and continuously according to the pump requirements specified herein, and that after due notice has been given by the Owner, he or the pump manufacturer will proceed, within a reasonable time to adjust, regulate, repair and renew at his expense such part or parts, equipment, auxiliaries appurtenances or perform such work as is necessary to maintain the guaranteed capacities, efficiencies and performances.

Pump Operating Conditions

Duplex station

Minimum rating

Design operating point 175 GPM @ 47' TDH and 140 GPM @ 60' TDH

Discharge Diameter – 4"

Maximum Operating Speed - 1750 RPM

Manufacturer - F.E. MYERS

Model – 4RH100M4-43 – pump to be non-overloading throughout the entire pump curve

Cable Length - 25' minimum

Warranty - Standard 5 year

Name Tags - 2 sets of stainless steel

Power Cable - 35'

Control Cable – 35'

Station Power – 460 volt – three phase

N O T I C E

Department of the Army Corps of Engineers “Letter of Permission” Authorization

&

Kentucky Division of Water 401 Water Quality Certification

PROJECT: Item No. 11-8001
Reconstruction of KY 2432
Clay County, KY

The Section 404 & 401 activities for this project have been permitted under the authority of the Department of the Army Nationwide Letter of Permission (LOP) & Division of Water General Water Quality Certification. In order for these authorizations to be valid, the attached conditions must be followed. The contractor shall post a copy of these authorizations in a conspicuous location at the project site for the duration of construction and comply with the general conditions as required.

To more readily expedite construction, the contractor may elect to alter the design or perform the work in a manner different from what was originally proposed and specified. Prior to commencing such alternative work, the contractor shall obtain **written** permission from the Division of Construction and the Division of Environmental Analysis. If such changes necessitate further permitting then the contractor will be responsible for applying to the Army Corps of Engineers and the Kentucky Division of Water (KDOW). A copy of any request to the Corps of Engineers or the KDOW to alter this proposal and subsequent responses shall be forwarded to the Division of Environmental Analysis, DA Permit Coordinator, for office records and for informational purposes.



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
EASTERN KENTUCKY REGULATORY OFFICE
845 SASSAFRAS CREEK ROAD
SASSAFRAS, KY 41759-8806

February 16, 2017

Regulatory Division
South Branch
ID No. LRL-2015-981

Mr. John Purdy
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Purdy:

This is in regard to your application for a Department of the Army (DA) permit received on November 13, 2015, concerning a plan to reconstruct KY 2432 between 2nd Street and the Left Fork of Coal Hollow Road, construct one bridge, 10 culverts, and multiple discharges of fill material for roadway construction (KYTC Item 11-8001.00) in Manchester in Clay County, Kentucky. We have reviewed your application and submitted information and have made the following determinations: the work is minor in nature, will not have a significant impact on the environment and should encounter no opposition.

Based on these determinations, your proposed work satisfies the Letter of Permission (LOP) criteria, as specified in our regulations and the procedures outlined in the LOP No. 200600259-pgj, issued on October 3, 2007. Therefore, you are authorized, in accordance with Section 404 of the Clean Water Act (CWA), to discharge fill material into 1,205 linear feet of tributaries of Goose Creek and 0.018 acres of wetlands within the Goose Creek watershed and 1,940 linear feet of tributaries of Hart Branch and 0.755 acres of wetlands within the Hart Branch watershed as part of the proposed project. The impacts would occur in and adjacent to the Hart Branch watershed of Goose Creek. Goose Creek is a tributary of the Red Bird River of the South Fork Kentucky River. This permission is granted with the following conditions:

- 1) The project shall be constructed in accordance with plans included in the November 30, 2015, application for Kentucky Transportation Cabinet, Item No. 11-8001 and all subsequent information received regarding changes to the original submittal.

- 2) The applicant must provide proof of purchase from Kentucky Department of Fish and Wildlife Resources for 606 EIU stream mitigation credits and 1.8 wetland mitigation credits prior to any discharge of dredged or fill material into "waters of the U.S."
- 3) The time limit for completing the work authorized ends on 31 December 2022. If the permittee finds that more time is needed to complete the authorized activity, an application must be submitted for a time extension to this office for consideration at least 1 month before the above date is reached.
- 4) Upon completion of construction you are to notify the District Engineer. The enclosed Completion Report form must be completed and returned to this office.
- 5) The permittee must agree to comply with the enclosed General Conditions.
- 6) The permittee must comply with the agreement outlined in the April 13, 2016 correspondence from U.S. Fish and Wildlife Service regarding the Biological Opinion on endangered species within the project area.

This authorization will be effective as soon as we receive your signed acceptance of these conditions. Please sign and date a duplicate copy of this letter in the space provided and return the signed copy. Note that we also perform periodic inspections to ensure compliance with our permit conditions and appropriate Federal laws.

This letter contains a proffered permit for your proposed project. If you object to this decision, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this decision, you must submit a completed RFA form to the Lakes and Rivers Division Office at the following address.

Regulatory Appeals Officer
U.S. Army Engineer Division
Great Lakes and Ohio River
550 Main Street - Room 10032
Cincinnati, Ohio 45202-3222
(513) 684-6212

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for

appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **March 21, 2017**.

It is not necessary to submit an RFA form to the Division office if you do not object to the decision in this letter.

This letter also contains a preliminary jurisdictional determination for your records. Preliminary jurisdictional determinations are not appealable and only state that the aquatic resources therein may be "waters of the U.S."

Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

FOR THE DISTRICT ENGINEER:

David Baldrige
Chief, South Branch
Regulatory Division

Enclosures

(I accept the conditions of this authorization):

Kentucky Transportation Cabinet

Date

Addresses for Coordinating Agencies

Mr. Duncan Powell
USEPA, Region IV
WCOB c/o SESD (Room A100-13)
980 College Station Road
Athens, Georgia 30605-2720

Mr. Virgil Lee Andrews
U.S. Fish & Wildlife Service
J.C. Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601

Director
Kentucky Energy & Environment Cabinet
Division of Water
200 Fair Oaks, 4th Floor
Frankfort, KY 40601

Dr. Gregory Johnson
Commissioner
Ky. Dept. of Fish and Wildlife Resources
#1 Game Farm Road
Frankfort, KY 40601

Mr. Craig Potts
Executive Director
State Historic Preservation Officer
Kentucky Heritage Council
300 Washington Street
Frankfort, KY 40601

GENERAL CONDITIONS:

1. Discharges of dredged or fill material into "waters of the U.S." must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site). In determining the minimal impact threshold, the Districts will consider the direct, secondary, and cumulative impacts of the fill or work and any mitigation measures.
2. The permittee shall provide a mitigation/monitoring plan for impacts resulting from the placement of fill into "waters of the U.S." in excess of 300 linear feet of intermittent or perennial stream; the filling of greater than 0.10 acre (4,356 sq. feet) of waters of the U.S; or work causing more than minimal effects, to compensate for impacts to the "waters of the U.S." These impact thresholds are applied for each crossing. When mitigation is required, the permittee will develop the mitigation site concurrently with, or in advance of, the site construction unless the Corps determines on a project specific basis that it is not practical to do so. This will ensure that aquatic functions are not lost for long periods of time (e.g. temporal loss) which could adversely affect water quality and wildlife. The requirement for conservation easements or deed restrictions will be determined on a project specific basis.
3. The permittee shall ensure that sedimentation and soil erosion control measures are in place prior to commencement of construction activities. These measures will remain in place and be properly maintained throughout construction. Sedimentation and soil control measures shall include the installation of straw bale barriers, silt fencing and/or other approved methods to control sedimentation and erosion. Sedimentation and erosion controls will not be placed in "waters of the U.S." except if specifically approved by the District.
4. The permittee shall ensure that areas disturbed by any construction activity, including channel and stream banks, are immediately stabilized and revegetated with a combination of non-invasive plants (grasses, legumes and shrubs) which are compatible with the affected area and will not compete with native vegetation.
5. The permittee shall ensure that no in-stream construction activity is performed during periods of high stream flow or during the fish spawning season (April 1 through June 30) without first contacting the Kentucky Department of Fish and Wildlife Resources (KDFWR) for their expertise on impacts to the fishery resource. Additionally, the discharge of dredged and/or fill material in known waterfowl breeding and wintering areas must be avoided to the maximum extent practicable.
6. The permittee will ensure that the activity authorized will not

disrupt movement of those aquatic species indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's specific purpose is to impound water.

7. The permittee shall ensure that all construction equipment is refueled and maintained on an upland site away from existing streams, drainageways and wetland areas. Heavy equipment working in wetlands must be placed on mats or other measures must be taken to minimize soil disturbance.

8. The permittee must comply with any case specific special conditions added by the Corps or by the State Section 401 Water Quality Certification (WQC). The conditions imposed in the State Section 401 WQC are also conditions of this LOP.

9. The permittee shall ensure that no activity authorized by the LOP may cause more than a minimal adverse effect on navigation.

10. The permittee shall ensure proper maintenance of any structure or fill authorized by the LOP, in good condition and in conformance with the terms and conditions of the LOP, including maintenance to ensure public safety. The permittee is not relieved of this requirement if the permitted activity is abandoned, although the permittee may make a good faith transfer to a third party. Should the permittee wish to cease to maintain the authorized activity or desire to abandon it without a good faith transfer, the permittee must obtain a modification to the LOP from the Corps, which may require restoration of the area.

11. The permittee shall not perform any work within any Wild and Scenic Rivers or in any river officially designated as a "study river" for possible inclusion in the system, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity authorized by the LOP will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal Land Management agency in the area (e.g. U.S. Forest Service, Bureau of Land Management, the National Parks Service, or the U.S. Fish and Wildlife Service).

12. The permittee shall not perform any work under the LOP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. The permittee shall notify the Corps and coordinate the

proposed action with the USFWS to determine if any listed species or critical habitat might be affected and/or adversely modified by the proposed work. No activity is authorized under the LOP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed. At the direction of the Corps, the permittee shall complete the necessary consultation with the USFWS, satisfying the requirements of Section 7(a)(2) of the Endangered Species Act. The permittee shall not begin work until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. Authorization of an activity under the LOP does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act.

Obligations under Section 7 of the Act must be reconsidered by the Corps Districts if (1) new information reveals impacts of the proposed action may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

13. The permittee shall not perform any activity under the LOP which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places until the District Engineer has complied with the provisions of 33 CFR Part 325, Appendix C. The permittee must notify the District Engineer if the activity authorized by the LOP may affect any historic properties listed, determined to be eligible or which the permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin construction until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the Kentucky Heritage Council.

If the permittee discovers any previously unknown historic or archaeological remains while accomplishing the activity authorized by the LOP, work must be immediately stopped and this office immediately notified regarding the discovery. The District will initiate the Federal, Tribal and State coordination required to determine if the

remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

14. The permittee shall not perform any work under the LOP where the discharge of dredged and/or fill material will occur in the proximity of a public water supply intake.

15. No activity, including structures or work in "waters of the U.S." or discharges of dredged or fill material may consist of unsuitable materials (e.g. trash, debris, car bodies, asphalt, etc.) and that materials used for construction or discharge must be free from toxic pollutants in toxic amounts.

16. The permittee shall, to the maximum extent practicable, design the project to maintain pre-construction downstream flow conditions. Furthermore, the work must not permanently restrict or impede the passage of normal or expected high flows and the structure or discharge of fill must withstand expected high flows. The project must provide, to the maximum extent practicable, for retaining excess flows from the site and for establishing flow rates from the site similar to pre-construction conditions.

17. The permittee shall ensure that all temporary fills, authorized under the LOP, be removed in their entirety and the affected areas returned to pre-construction elevation.

18. Representatives from the Corps of Engineers and/or the State of Kentucky may inspect any authorized activity or mitigation site at any time deemed necessary to ensure compliance with the terms and conditions of the LOP, Section 401 WQC, and applicable laws.

19. All work authorized by this LOP must be completed within five years after the date of the Corps authorization letter. If you find you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least three months before the expiration date.

20. The permittee, after completion of work under the LOP, shall submit a signed certification letter regarding the completed work and required mitigation, if applicable. The certification letter will include a statement that the work was done in accordance with the LOP authorization including compliance with all general and special conditions and completion of mitigation work.

21. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is

being or has been accomplished with the terms and conditions of the LOP.

22. For Section 10 waters, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

U.S. Army Corps of Engineers

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): January 19, 2017

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:

APPLICANT:
John Purdy, KYTC
200 Mero Street
Frankfort, KY 40622

AGENT:
Sarah Brower
Redwing Ecological Services
1139 South Fourth Street
Louisville, KY 40203

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: LRL-2015-981; KYTC
Item No. 11-8001 (Hwy 2432 Reconstruction Project)

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: This project is located within the Lower Little Goose Creek Huc-12 affecting unnamed tributaries of Goose Creek and Hart Branch. Hart Branch empties into Goose Creek of the Red Bird River. *(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)*

State: Kentucky County: Clay City: Manchester

Center coordinates of site Latitude and Longitude (NAD 83):
Latitude: 37.16447 North, Longitude: -83.75185 West

Authority: Section 404 Section 10

Name of nearest waterbody: Goose Creek

Identify (estimate) amount of waters in the review area:

Non-wetland waters: 10,485 linear feet: ~5 width (ft) and/or ft wide, 1.20 acres.

Cowardin Class: Riverine

Stream Flow: Ephemeral, Intermittent, and Perennial

Wetlands: 0.705 acres.

Cowardin Class: Emergent

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal: N/A

Non-Tidal: NA

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination.

Date: *Date*

Field Determination.

Date(s): January 7, 2016

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring “pre-construction notification” (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. §331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable. This preliminary JD finds that there “*may be*” waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply)
- checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps: Completed by PM for formatting purposes
- Corps navigable waters' study:
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: 1 : 24 , 0000 Manchester , KY
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps: [Click here to enter text.](#)
- 100-year Floodplain Elevation is:
 - (National Geodectic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): Google Earth Imagery
 - or Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

1-19-2017

Signature and date of Regulatory Project
Manager (REQUIRED)

Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining
the signature is impracticable)

Site Number	Latitude/ Northing	Longitude/ Easting	Cowardin Class/ Stream Flow	Estimated Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
Perennial #1 (Goose Creek)	37.15899	-83.76549	Riverine	200 LF	Section 404
Intermittent #3 (Goose Creek)	37.16145	-83.76100	Riverine	920 LF	Section 404
Ephemeral #3 (Goose Creek)	37.16107	-83.76024	Riverine	35 LF	Section 404
Ephemeral #4 (Goose Creek)	37.16103	-83.75967	Riverine	450 LF	Section 404
Wetland #1 (Goose Creek)	37.16109	-83.76010	Palustrine	0.018 Ac.	Section 404
Perennial #2 (Hart Branch)	37.16317	-83.73647	Riverine	5,070 LF	Section 404
Perennial #3 (Hart Branch)	37.16184	-83.74506	Riverine	1,220 LF	Section 404
Intermittent #1 (Hart Branch)	37.16447	-83.75185	Riverine	735 LF	Section 404
Ephemeral #5 (Hart Branch)	37.16387	-83.75323	Riverine	475 LF	Section 404
Ephemeral #7 (Hart Branch)	37.16587	-83.74384	Riverine	300 LF	Section 404
Ephemeral #8 (Hart Branch)	37.16531	-83.74306	Riverine	180 LF	Section 404
Ephemeral #9 (Hart Branch)	37.16681	-83.73771	Riverine	900 LF	Section 404
Wetland #2 (Hart Branch)	37.16318	-83.75415	Palustrine	0.206 Ac.	Section 404
Wetland #3 (Hart Branch)	37.16509	-83.74262	Palustrine	0.120 Ac.	Section 404
Wetland #4 (Hart Branch)	37.16490	-83.74110	Palustrine	0.242 Ac.	Section 404

Wetland #5 (Hart Branch)	37.16558	-83.74386	Palustrine	0.003 Ac.	Section 404
Wetland #6 (Hart Branch)	37.16422	-83.75237	Palustrine	0.112 Ac.	Section 404
Wetland #7 (Hart Branch)	37.16487	-83.73922	Palustrine	0.004 Ac.	Section 404



MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION

DIVISION OF WATER

200 FAIR OAKS LANE, 4TH FLOOR

FRANKFORT, KENTUCKY 40601

www.kentucky.gov

April 8, 2016

Attention: David Waldner
cc. John Purdy
Kentucky Transportation Cabinet (KYTC)
200 Mero St
Frankfort, KY 40622

Re: Water Quality Certification #2016-026-7
AI No.: 128250; Activity ID: APE20150001
KYTC Item No.: 11-8001; KY 2432 - Clay Co
USACE Public Notice No.: LRL-2015-981
Goose Creek, UTs to Goose Creek, Hart
Branch, UTs to Hart Branch, and adjacent
wetlands
Clay County, Kentucky

Dear Mr. Waldner:

Pursuant to Section 401 of the Clean Water Act (CWA), the Commonwealth of Kentucky certifies it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 303, 304, 306, and 307 of the CWA, will not be violated by the above referenced project provided that the U.S. Army Corps of Engineers authorizes the activity under 33 CFR part 330, and the attached conditions are met.

All future correspondence on this project must reference **AI No. 128250**. **The attached document is your official Water Quality Certification; please read it carefully.** If you should have any questions concerning the conditions of this water quality certification, please contact Cody Thayer of my staff by calling (502) 564-3410 or Cody.Thayer@ky.gov.

Sincerely,

A handwritten signature in black ink that reads "Stephanie Hayes".

Stephanie Hayes, Supervisor
Water Quality Certification Section
Kentucky Division of Water

Attachment

cc: Todd Williams, USACE: Louisville (Via email: Christopher.T.Williams@usace.army.mil)
Lee Andrews, USFWS: Frankfort (Via email: Teresa_Hyatt@fws.gov)
John Purdy, KYTC: Frankfort (Via email: JPurdy@ky.gov)
Robert Miller, KDOW: London Regional Office (Via email: RobertL.Miller@ky.gov)
Malissa McAlister, Kentucky River Basin Coordinator (Via email: mlmcal2@uky.edu)
Clifford Scott, KDFWR: FILO Program (via email: clifford.scott@ky.gov)

KTC Water Quality Certification

KY 2432 - Clay Co

Facility Requirements

Permit Number: 2016-026-7

Activity ID No.:APE20150001

Page 1 of 2

ACTV0000000001 (Transportation Project - KYTC Item No.: 11-8001) 785 ft. perennial, 1,200 ft. intermittent, 1,160 ft. ephemeral stream impacts; 0.773 acre wetland fill:

Submittal/Action Requirements:

Condition No.	Condition
S-1	The Kentucky Transportation Cabinet shall notify the Division: Due prior to any construction activity. Notify Cody Thayer at (502) 564-4310 or Cody.Thayer@ky.gov at least two weeks prior to the start of construction. [Clean Water Act]
S-2	The Kentucky Transportation Cabinet shall submit a copy of the in-lieu fee receipt paid to the Kentucky Department of Fish and Wildlife Resources: Wetland and Stream Restoration Fund to the Water Quality Certification Section before the beginning of construction. The in-lieu fee is mitigation for 505.4 EIUs of stream impact and 1.496 AMUs of wetland impact. [Clean Water Act]
S-3	The Kentucky Transportation Cabinet shall notify the Division: Due when construction is complete. Notify Cody Thayer at (502) 564-4310 or Cody.Thayer@ky.gov no later than two weeks post-construction. [Clean Water Act]

Narrative Requirements:

Condition No.	Condition
T-1	The work approved by this certification shall be limited to: -The reconstruction of approximately 1.7 miles of KY 2432 through northeastern Manchester, Kentucky and extending east of the city resulting in impacts to approximately 3,145 linear ft. of stream (785 linear ft. perennial; 1,200 linear ft. intermittent; 1,160 linear ft. ephemeral) and 0.773 acre of wetland. [Clean Water Act]
T-2	All work performed under this certification shall adhere to the design and specifications set forth in the following documents: - Application for Permit to Construct Across or Along a Stream and/or Water Quality Certification dated November 6, 2015; - Addendum to the Section 401 WQC Application dated January 15, 2016; - Correspondence concerning mitigation dated February 25, 2016. [Clean Water Act]
T-3	The Kentucky Transportation Cabinet is responsible for preventing degradation of waters of the Commonwealth from soil erosion. An erosion and sedimentation control plan must be designed, implemented, and maintained in effective operating condition at all times during construction. [Clean Water Act]
T-4	The Division of Water reserves the right to modify or revoke this certification should it be determined that the activity is in noncompliance with any condition set forth in this certification. [Clean Water Act]

KTC Water Quality Certification

KY 2432 - Clay Co

Facility Requirements

Permit Number: 2016-026-7

Activity ID No.:APE20150001

Page 2 of 2

ACTV0000000001 (Transportation Project - KYTC Item No.: 11-8001) 785 ft. perennial, 1,200 ft. intermittent, 1,160 ft. ephemeral stream impacts; 0.773 acre wetland fill:

Narrative Requirements:

Condition No.	Condition
T-5	If construction does not commence within three years of the date of this letter, this certification will become void. A letter requesting a renewal should be submitted. [Clean Water Act]
T-6	Other permits from the Division of Water may be required for this activity. If this activity occurs within a floodplain, a Permit to Construct Across or Along a Stream may be required. Please contact the Floodplain Section Supervisor (502-564-3410) for more information. If the project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a Kentucky Pollution Discharge Elimination System (KPDES) stormwater permit shall be required from the Surface Water Permits Branch. This permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must include erosion prevention and sediment control measures. Contact: Surface Water Permits Branch (SWPB) Support (502-564-3410 or SWPBsupport@ky.gov)
T-7	Dredging work shall not be conducted during the fish spawning season, April 15th through June 15th. [Clean Water Act]
T-8	Check dams are not allowed within the stream channel. [Clean Water Act]
T-9	Remove all sediment and erosion control measures after re-vegetation has become well-established. [Clean Water Act]

GENERAL CONDITIONS FOR WATER QUALITY CERTIFICATION

1. Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
2. All dredged material shall be removed to an upland location and/or graded on adjacent areas (so long as such areas are not regulated wetlands), to obtain original streamside elevations, i.e. overbank flooding shall not be artificially obstructed.
3. In areas not riprapped or otherwise stabilized, revegetation of stream banks and riparian zones shall occur concurrently with project progression. At a minimum, revegetation will approximate pre-disturbance conditions.
4. To the maximum extent practicable, all instream work under this certification shall be performed during low flow.
5. Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances where such instream work is unavoidable, then it shall be performed in such a manner and duration as to minimize resuspension of sediments and disturbance to substrates and bank or riparian vegetation.
6. Any fill or riprap including refuse fill, shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If riprap is utilized, it is to be of such weight and size that bank stress or slump conditions will not be created because of its placement.
7. If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when work will be done.
8. Removal of existing riparian vegetation should be restricted to the minimum necessary for project construction.
9. Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling 800/564-2380.



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200 FAIR OAKS LANE, 4TH FLOOR

FRANKFORT, KENTUCKY 40601

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ATTENTION APPLICANT

If your project involves one or more of the following activities, you may need more than one permit from the Kentucky Division of Water.

***building in a floodplain *road culvert in a stream**

***streambank stabilization *stream cleanout**

***utility line crossing a stream**

***construction sites greater than 1 acre**

- **Construction sites greater than 1 acre will require the filing of a Notice of Intent to be covered under the KPDES General Stormwater Permit. This permit requires the creation of an erosion control plan.**

Contact: Surface Water Permits Branch (SWPB) Support at (502) 564-3410 or SWPBsupport@ky.gov

- **Projects that involve filling in the floodplain will require a floodplain construction permit from the Water Resources Branch.**

Contact: Ron Dutta

- **Projects that involve work IN a stream, such as bank stabilization, road culverts, utility line crossings, and stream alteration will require a floodplain permit and a Water Quality Certification from the Division of Water.**

Contact: Stephanie Hayes

All three contacts listed above can be reached at (502) 564-3410. A complete listing of environmental programs administered by the Kentucky Department for Environmental Protection is available from Pete Goodmann by calling (502) 564-3410.

KyTC BMP Plan for Project CID ## - ####



Kentucky Transportation Cabinet

Highway District 11

And

_____ **(2), Construction**

Kentucky Pollutant Discharge Elimination System

Permit KYR10

Best Management Practices (BMP) plan

Groundwater protection plan

For Highway Construction Activities

For

KY 2432 Reconstruction

Project: CID ## - ####

KyTC BMP Plan for Project CID ## -

Project information

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

1. Owner – Kentucky Transportation Cabinet, District 11
2. Resident Engineer: (2)
3. Contractor name: (2)
Address: (2)

Phone number: (2)
Contact: (2)
Contractors agent responsible for compliance with the KPDES permit requirements (3):
4. Project Control Number (2)
5. Route (Address) Memorial Drive, Manchester, KY 40962
6. Latitude/Longitude (project mid-point) dd/mm/ss, dd/mm/ss
37°09'46" / 83°45'18"
7. County (project mid-point) Clay County
8. Project start date (date work will begin): (2)
9. Projected completion date: (2)

KyTC BMP Plan for Project CID ## -

A. Site description:

1. Nature of Construction Activity (from letting project description)
Reconstruct KY 2432 from Second Street in east Manchester north to the left fork of Coal Hollow Road.
2. Order of major soil disturbing activities **(2) and (3)**
3. Projected volume of material to be moved **930,485 cu. yd. of com. exc.**
4. Estimate of total project area (acres) **49 acres**
5. Estimate of area to be disturbed (acres) **49 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. **(2)**
7. Data describing existing soil condition **(1) & (2)**
8. Data describing existing discharge water quality (if any) **(1) & (2)**
9. Receiving water name **Goose Creek**
10. TMDLs and Pollutants of Concern in Receiving Waters: **Sediment**
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

KyTC BMP Plan for Project CID ## -

and operating construction equipment, concrete washout water, sanitary wastes and trash/debris. (3)

B. Sediment and Erosion Control Measures:

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

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

2. Following award of the contract, the contractor and resident engineer will annotate the erosion control sheets showing location and type of BMPs for each of the DDAs that will be disturbed at the outset of the project. This annotation will be accompanied by an order of work that reflects the order or sequence of major soil moving activities. The remaining DDAs are to be designated as "Do Not Disturb" until the contractor and resident engineer prepare the plan for BMPs to be employed. The initial BMP's shall be for the first phase (generally Clearing and Grubbing) and shall be modified as needed as the project changes phases. The BMP Plan will be modified to reflect disturbance in additional DDA's as the work progresses. All DDA's will have adequate BMP's in place before being disturbed.
3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:
 - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
 - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water.

KyTC BMP Plan for Project CID ## -

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:

KyTC BMP Plan for Project CID ## -

- 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 : **Permanent Seeding and Protection, Channel Lining**

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 Section 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

KyTC BMP Plan for Project CID ## -

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

KyTC BMP Plan for Project CID ## -

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.

KyTC BMP Plan for Project CID ## -

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

D. Other State and Local Plans

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

KyTC BMP Plan for Project CID ## -

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. **Not Applicable**

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 successfully completed the KEPSC-RI course as required by Section 213.02.02 of the Standard Specifications for Road and Bridge Construction, current edition.
- 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.

KyTC BMP Plan for Project CID ## -

- Sediment basins will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 50 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:

KyTC BMP Plan for Project CID ## -

_____ 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

KyTC BMP Plan for Project CID ## -

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.)



MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

AARON B. KEATLEY
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

November 1, 2017

Mike Calebs
KYTC District 11
PO Box 250
Manchester, KY 40962

Re: **KYR10 Coverage Acknowledgment**
KPDES No.: **KYR10L948**
Permit Type: **Construction**
AI ID: **128250**
11-8001 Memorial Drive KY 2432
KY 2432
Manchester, Clay County, Kentucky

Dear **Mike Calebs**:

The discharges associated with the Notice of Intent you submitted have been approved for coverage under the "Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Storm Water Discharges Associated with Construction Activities (KYR100000)" master general permit. Your coverage becomes effective on the date of this letter, and will automatically terminate: two years from the effective date of coverage unless an extension is requested prior to the termination date, upon the November 30, 2019, expiration of the KYR100000 master general permit, or upon the revocation of coverage by the Division of Water, whichever comes first. During this period of coverage, all discharges shall comply with the conditions of the KYR100000 master general permit. This permit and links to the eNOI (and permit coverage extension) and eNOT forms can be found on our website:

<http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf>.

Any questions concerning the general permit and its requirements should be directed to the undersigned at **502-782-7048**:

Construction Site GPS Coordinates: **37.161088, -83.760675**
Receiving Water: **Goose Creek**

Sincerely,

A handwritten signature in black ink that reads "Justina Bascombe".

Justina Bascombe
Surface Water Permits Branch
Division of Water

26 OCT 2017

Item No.	11 - 8001			Project Mgr.	kytc\david.fields	
			County	CLAY	Route	KY-2432
CAP #	Date of Promise	Promise made to:	Location of Promise			
1	26-OCT-17	David Fields	Entire Project			
CAP Description						
SHOULD SUSPECT PETROLEUM CONTAMINATED SOILS BE ENCOUNTERED DURING EXCAVATION/CONSTRUCTION THEY SHOULD NOT BE REUSED OR DISCARDED WITHOUT KYTC AUTHORIZATION, THE CONTRACTOR SHALL IMMEDIATELY CONTACT KYTC DIVISION OF ENVIRONMENTAL ANALYSIS (DEA), (CHRIS CUMMINS, BRITTANY STRATTON) AT (502) 564-7250. KYTC DEA WILL COORDINATE WITH LEE ENGINEERING TO ASSIST THE CONTRACTOR IN CHARACTERIZING THE SOIL AND/OR GROUNDWATER FOR REMOVAL/DISPOSAL OF CONTAMINATED MATERIAL. THE CONTRACTOR MAY COORDINATE TO WORK IN OTHER AREAS UNTIL THE MATERIAL IS REMOVED. PARCELS THAT KYTC HAS IDENTIFIED BUT IS NOT LIMITED TO POTENTIAL CONTAMINATION ARE P1, P2, P10 AND P55.						
2	26-OCT-17	David Fields	Entire Project			
CAP Description						
TREE CLEARING IS RESTRICTED FROM APRIL 1 TO OCTOBER 14.						
3	26-OCT-17	David Fields	Parcel 2			
CAP Description						
TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 2 SHALL BE LIMITED TO A 3 MONTH DURATION.						

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 2016*.

SUPPLEMENTAL SPECIFICATIONS

The contractor shall use the Supplemental Specifications that are effective at the time of letting.
The Supplemental Specifications can be found at the following link:

<http://transportation.ky.gov/Construction/Pages/Kentucky-Standard-Specifications.aspx>

SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

2.0 MATERIALS.

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

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

2.2 Sign and Controls. All signs must:

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

- 12) Allow an on-off flashing sequence at an adjustable rate.
- 13) Provide a sight to aim the message.
- 14) Provide a LED display color of approximately 590 nm amber.
- 15) Provide a controller that is password protected.
- 16) Provide a security device that prevents unauthorized individuals from accessing the controller.
- 17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

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

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

2.3 Power.

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

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

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

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

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

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

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

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

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

SPECIAL NOTE FOR ROCK BLASTING

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

1.0 DESCRIPTION. This work consists of fracturing rock and constructing stable final rock cut faces using presplit blasting and production blasting techniques.

2.0 MATERIALS. Deliver, store, and use explosives according to the manufacturer's recommendations and applicable laws. Do not use explosives outside their recommended use date. Verify date of manufacture and provide copies of the technical data sheets (TDS) and material safety data sheets (MSDS) to the Engineer. Explosives and initiating devices include, but are not necessarily limited to, dynamite and other high explosives, slurries, water gels, emulsions, blasting agents, initiating explosives, detonators, blasting caps, and detonating cord.

3.0 CONSTRUCTION. Furnish copies or other proof of all-applicable permits and licenses. Comply with Federal, State, and local regulations on the purchase, transportation, storage, and use of explosive material. Regulations include but are not limited to the following:

- 1) KRS 351.310 through 351.9901.
- 2) 805 KAR 4:005 through 4:165
- 3) Applicable rules and regulations issued by the Office of Mine Safety and Licensing.
- 4) Safety and health. OSHA, 29 CFR Part 1926, Subpart U.
- 5) Storage, security, and accountability. Bureau of Alcohol, Tobacco, and Firearms (BATF), 27 CFR Part 181.
- 6) Shipment. DOT, 49 CFR Parts 171-179, 390-397.

3.1 Blaster-in-Charge. Designate in writing a blaster-in-charge and any proposed alternates for the position. Submit documentation showing the blaster-in-charge, and alternates, have a valid Kentucky blaster's license. Ensure the blaster-in-charge or approved alternate is present at all times during blasting operations.

3.2 Blasting Plans. Blasting plans and reports are for quality control and record keeping purposes. Blasting reports are to be signed by the blaster-in-charge or the alternate blaster-in-charge. The general review and acceptance of blasting plans does not relieve the Contractor of the responsibility whatsoever for conformance to regulations or for obtaining the required results. All blasting plans shall be submitted to the Engineer. The Engineer will be responsible for submitting the plan to the Central Office Division of Construction and the Division of Mine Reclamation and Enforcement, Explosives and Blasting Branch at the following address: 2 Hudson Hollow, Frankfort, Kentucky, 40601.

- A) General Blasting Plan.** Submit a general blasting plan for acceptance at least 15 working days before drilling operations begin. Include, as a minimum, the following safety and procedural details:

- 1) Working procedures and safety precautions for storing, transporting, handling, detonating explosives. Include direction on pre and post blast audible procedures, methods of addressing misfires, and methods of addressing inclement weather, including lightning.
 - 2) Proposed product selection for both dry and wet holes. Furnish Manufacturer's TDS and MSDS for all explosives, primers, initiators, and other blasting devices.
 - 3) Proposed initiation and delay methods.
 - 4) Proposed format for providing all the required information for the site specific blasting shot reports.
- B) Preblast Meeting.** Prior to drilling operations, conduct a preblast meeting to discuss safety and traffic control issues and any site specific conditions that will need to be addressed. Ensure, at a minimum, that the Engineer or lead inspector, Superintendent, blaster-in-charge, and all personnel involved in the blasting operation are present. Site specific conditions include blast techniques; communication procedures; contingency plans and equipment for dealing with errant blast material. The conditions of the General Blasting plan will be discussed at this meeting. Record all revisions and additions made to the blasting plan and obtain written concurrence by the blaster-in-charge. Provide a copy of the signed blast plan to the Engineer along with the sign in sheet from the preblast meeting.

3.3 Preblast Condition Survey and Vibration Monitoring and Control. Before blasting, arrange for a preblast condition survey of nearby buildings, structures, or utilities, within 500 feet of the blast or that could be at risk from blasting damage. Provide the Engineer a listing of all properties surveyed and any owners denying entry or failing to respond. Notify the Engineer and occupants of buildings at risk at least 24 hours before blasting.

Limit ground vibrations and airblast to levels that will not exceed limits of 805 KAR 4:005 through 4:165. More restrictive levels may be specified in the Contract.

Size all blast designs based on vibration, distance to nearest building or utility, blast site geometry, atmospheric conditions and other factors. Ground vibrations are to be controlled according to the blasting standards and scaled distance formulas in 805 KAR 4:020 or by the use of seismographs as allowed in 805 KAR 4:030. The Department will require seismographs at the nearest allowable location to the protected site when blasting occurs within 500 feet of buildings, structures, or utilities.

3.4 Blasting. Drill and blast at the designated slope lines according to the blasting plan. Perform presplitting to obtain smooth faces in the rock and shale formations. Perform the presplitting before blasting and excavating the interior portion of the specified cross section at any location. The Department may allow blasting for fall benches and haul roads prior to presplitting when blasting is a sufficient distance from the final slope and results are satisfactory to the Engineer. Use the types of explosives and blasting accessories necessary to obtain the required results.

Free blast holes of obstructions for their entire depth. Place charges without caving the blast hole walls. Stem the upper portion of all blast holes with dry sand or other granular material passing the 3/8-inch sieve. Dry drill cuttings are acceptable for stemming when blasts are more than 800 feet from the nearest dwelling.

11D

Stop traffic during blasting operations when blasting near any road and ensure traffic does not pass through the Danger Zone. The blaster-in-charge will define the Danger Zone prior to each blast. Ensure traffic is stopped outside the Danger Zone, and in no case within 800 feet of the blast location.

Following a blast, stop work in the entire blast area, and check for misfires before allowing worker to return to excavate the rock.

Remove or stabilize all cut face rock that is loose, hanging, or potentially dangerous. Leave minor irregularities or surface variations in place if they do not create a hazard. Drill the next lift only after the cleanup work and stabilization work is complete.

When blasting operations cause fracturing of the final rock face, repair or stabilize it in an approved manner at no cost to the Department.

Halt blasting operations in areas where any of the following occur:

- 1) Slopes are unstable;
- 2) Slopes exceed tolerances or overhangs are created;
- 3) Backslope damage occurs;
- 4) Safety of the public is jeopardized;
- 5) Property or natural features are endangered;
- 6) Fly rock is generated; or
- 7) Excessive ground or airblast vibrations occur in an area where damage to buildings, structures, or utilities is possible.
- 8) The Engineer determines that materials have become unsuitable for blasting

Blasting operations may continue at a reasonable distance from the problem area or in areas where the problems do not exist. Make the necessary modifications to the blasting operations and perform a test blast to demonstrate resolution of the problem.

A) Drill Logs. Maintain a layout drawing designating hole numbers with corresponding drill logs and provide a copy of this information to the blaster prior to loading the hole. Ensure the individual hole logs completed by the driller(s) show their name; date drilled; total depth drilled; and depths and descriptions of significant conditions encountered during drilling that may affect loading such as water, voids, changes in rock type.

B) Presplitting. Conduct presplitting operations in conformance with Subsection 204.03.04 of the Standard Specifications for Road and Bridge Construction.

3.5 Shot Report. Maintain all shot reports on site for review by the Department. Within one day after a blast, complete a shot report according to the record keeping requirements of 805 KAR 4:050. Include all results from airblast and seismograph monitoring.

3.6 Unacceptable Blasting. When unacceptable blasting occurs, the Department will halt all blasting operations. Blasting will not resume until the Department completes its investigation and all concerns are addressed. A blast is unacceptable when it results in fragmentation beyond the final rock face, fly rock, excessive vibration or airblast, overbreak, damage to the final rock face or overhang. Assume the cost for all resulting damages to private and public property and hold the Department harmless.

11D

When an errant blast or fly rock causes damage to or blocks a road or conveyance adjacent to the roadway, remove all debris from the roadway as quickly as practicable and perform any necessary repairs. Additionally, when specified in the Contract, the Department will apply a penalty.

Report all blasting accidents to the Division of Mine Reclamation and Enforcement, Explosives and Blasting Branch at 502-564-2340.

4.0 MEASUREMENT AND PAYMENT. The Department will not measure this work for payment and will consider all items contained in this note to be incidental to either Roadway Excavation or Embankment-in-Place, as applicable. However, if the Engineer directs in writing slope changes, then the Department will pay for the second presplitting operation as Extra Work.

The Department will measure for payment material lying outside the typical section due to seams, broken formations, or earth pockets, including any earth overburden removed with this material, only when the work is performed under authorized adjustments.

The Department will not measure for payment any extra material excavated because of the drill holes being offset outside the designated slope lines.

The Department will not measure for payment any material necessary to be removed due to the inefficient or faulty blasting practices.

June 15, 2012

SPECIAL NOTE FOR BARCODE LABEL ON PERMANENT SIGNS

1.0 DESCRIPTION. Install barcode label on sheeting signs. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

2.0 MATERIALS. The Department will provide the Contractor with a 2 inch x 1 inch foil barcode label for each permanent sheeting sign. A unique number will be assigned to each barcode label.

The Contractor shall contact the Operations and Pavement Management Branch in the Division of Maintenance at (502) 564-4556 to obtain the barcode labels.

3.0 CONSTRUCTION. Apply foil barcode label in the lower right quadrant of the sign back. Signs where the bottom edge is not parallel to the ground, the lowest corner of the sign shall serve as the location to place the barcode label. The barcode label shall be placed no less than one-inch and no more than three inches from any edge of the sign. The barcode must be placed so that the sign post does not cover the barcode label.

Barcodes shall be applied in an indoor setting with a minimum air temperature of 50°F or higher. Prior to application of the barcode label, the back of the sign must be clean and free of dust, oil, etc. If the sign is not clean, an alcohol swab shall be used to clean the area. The area must be allowed to dry prior to placement of the barcode label.

Data for each sign shall include the barcode number, MUTCD reference number, sheeting manufacturer, sheeting type, manufacture date, color of primary reflective surface, installation date, latitude and longitude using the North American Datum of 1983 (NAD83) or the State Plane Coordinates using an x and y ordinate of the installed location.

Data should be provided electronically on the TC 71-229 Sign Details Information and TC 71-230 Sign Assembly Information forms. The Contractor may choose to present the data in a different format provided that the information submitted to the Department is equivalent to the information required on the Department TC forms. The forms must be submitted in electronic format regardless of which type of form is used. The Department will not accept PDF or handwritten forms. These completed forms must be submitted to the Department prior to final inspection of the signs. The Department will not issue formal acceptance for the project until the TC 71-229 and TC-230 electronic forms are completed for all signs and sign assemblies on the project.

4.0 MEASUREMENT. The Department will measure all work required for the installation of the barcode label and all work associated with completion and submission of the sign inventory data (TC 71-229 and TC 71-230).

The installation of the permanent sign will be measured in accordance to Section 715.

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

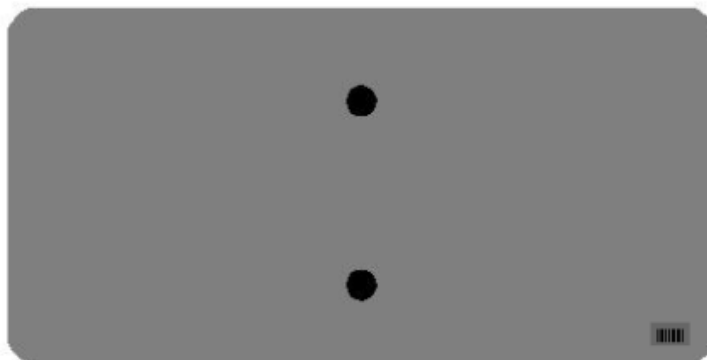
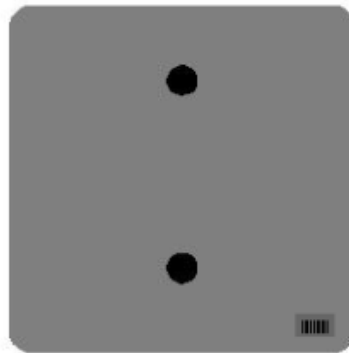
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24631EC	Barcode Sign Inventory	Each

The Department will not make payment for this item until all barcodes are installed and sign inventory is complete on every permanent sign installed on the project. The Department will make payment for installation of the permanent sign in accordance to Section 715. The Department will consider payment as full compensation for all work required under this special note.

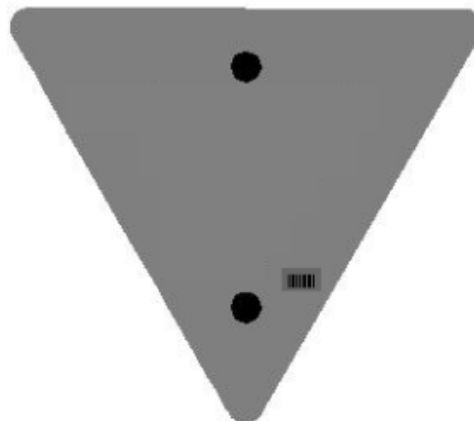
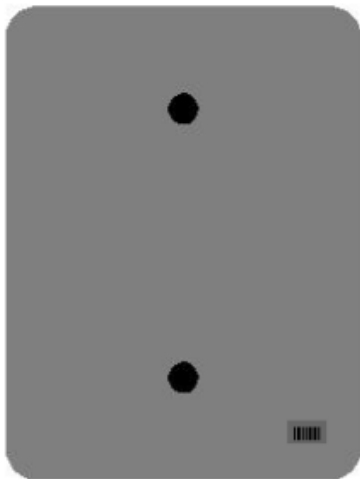
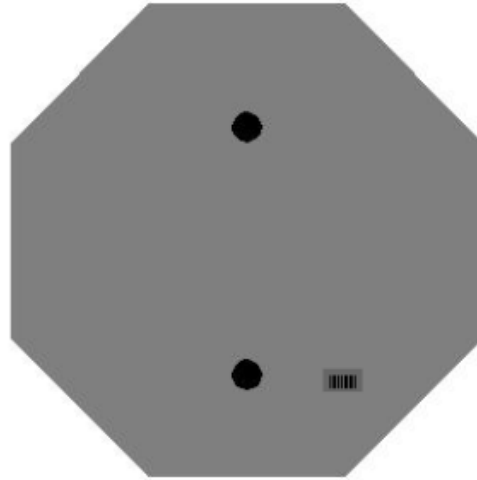
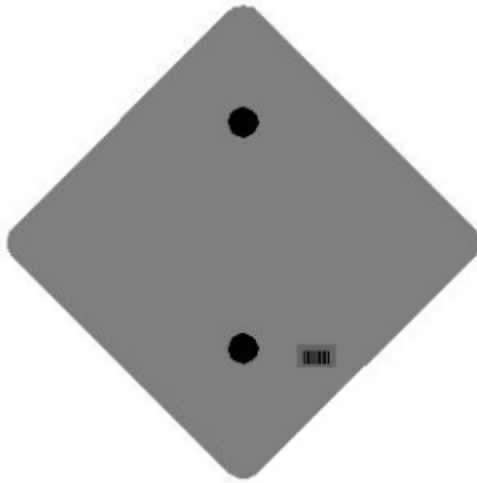
One Sign Post



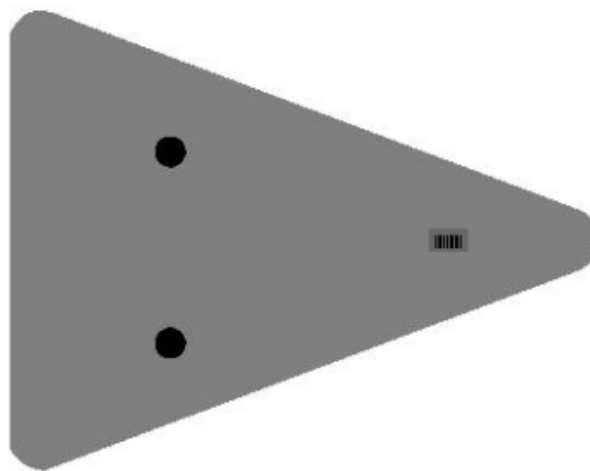
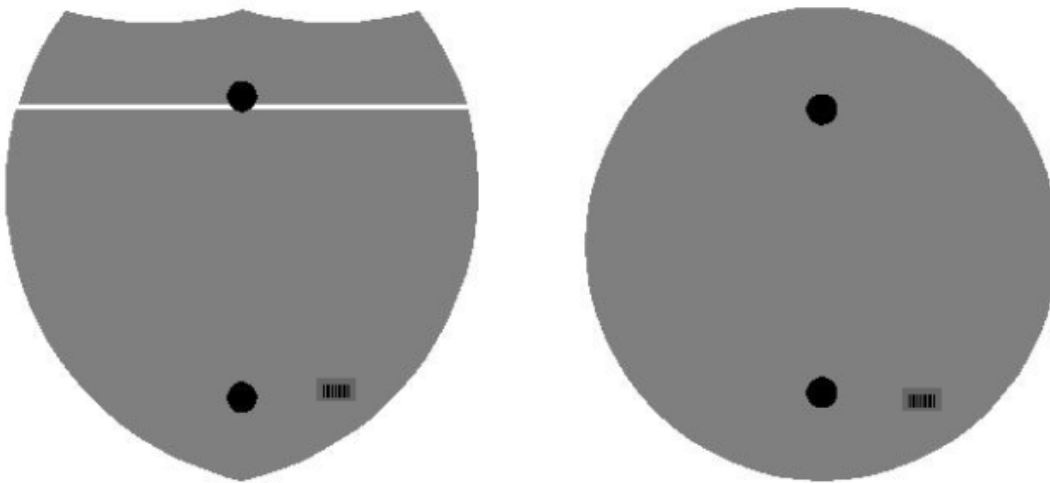
↑
2" Wide Post



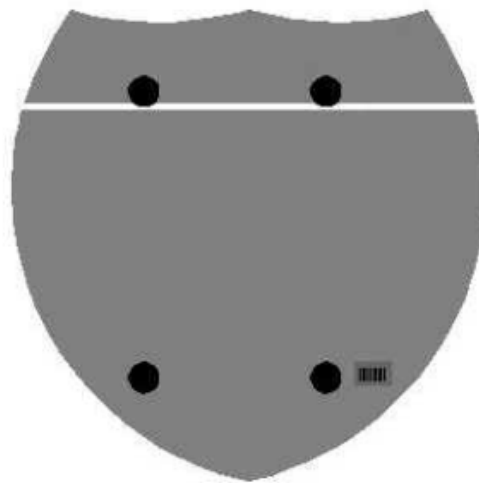
One Sign Post



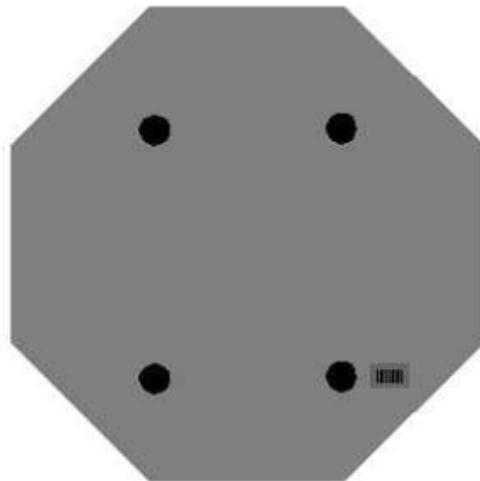
One Sign Post



Double Sign Post



Interstate
Shield

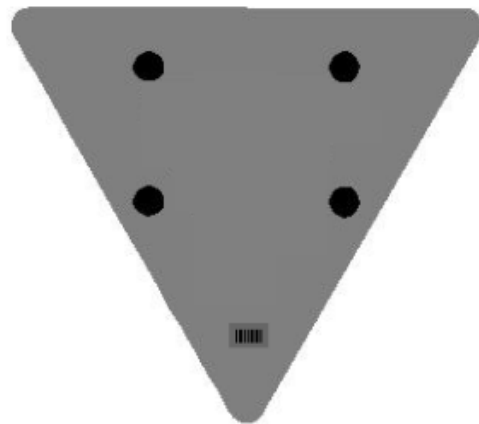


48" Stop

2 Post Signs



↑
2" Wide Post



SPECIAL PROVISION FOR EMBANKMENT AT BRIDGE END BENT STRUCTURES

This Special Provision will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction, Current Edition.

1.0 DESCRIPTION. Construct a soil, granular, or rock embankment with soil, granular or cohesive pile core and place structure granular backfill, as the Plans require. Construct the embankment according to the requirements of this Special Provision, the Plans, Standard Drawing RGX 100 and 105, and the Standard Specifications, Current Edition.

2.0 MATERIALS.

2.1 Granular Embankment. Conform to Subsection 805.10. When Granular Embankment materials are erodible or unstable according to Subsection 805.03.04, use the Special Construction Methods found in 3.2 of the Special Provision.

2.2 Rock Embankment. Provide durable rock from roadway excavation that consists principally of Unweathered Limestone, Durable Shale (SDI equal to or greater than 95 according to KM 64-513), or Durable Sandstone.

2.3 Pile Core. Provide a pile core in the area of the embankments where deep foundations are to be installed unless otherwise specified. The Pile Core is the zone indicated on Standard Drawings RGX 100 and 105 designated as Pile Core. Material control of the pile core area during embankment construction is always required. Proper Pile Core construction is required for installation of foundation elements such as drilled or driven piles or drilled shafts. The type of material used to construct the pile core is as directed in the plans or below. Typically, the pile core area will be constructed from the same material used to construct the surrounding embankment. Pile Core can be classified as one of three types:

A) Pile Core - Conform to Section 206 of the Standard Specifications. Provide pile core material consisting of the same material as the adjacent embankment except the material in the pile core area shall be free of boulders or particle sizes larger than 4 inches in any dimension or any other obstructions that may hinder pile driving operations. If the pile core material hinders pile driving operations, take the appropriate means necessary to reach the required pile tip elevation, at no expense to the Department.

B) Granular Pile Core. Granular pile core is required only when specified in the plans. Select a gradation of durable rock to facilitate pile driving that conforms to Subsection 805.11. If granular pile core material hinders pile driving operations, take appropriate means necessary to reach the required pile tip elevation, at no expense to the Department.

C) Cohesive Pile Core. Cohesive Pile Core is required only when specified in the plans. Conform to Section 206 of the Standard Specifications and use soil with at least 50 percent passing a No. 4 sieve having a minimum Plasticity Index (PI) of 10. In addition, keep the cohesive pile core free of boulders, larger than 4 inches in any dimension, or any other obstructions, which would interfere with drilling operations. If cohesive pile core material interferes with drilling operations, take appropriate means necessary to maintain

excavation stability, at no expense to the Department.

2.4 Structure Granular Backfill. Conform to Subsection 805.11

2.5 Geotextile Fabric. Conform to Type I or Type IV in Section 214 and 843.

3.0 CONSTRUCTION.

3.1 General. Construct roadway embankments at end bents according to Section 206 and in accordance with the Special Provision, the Plans, and Standard Drawings for the full embankment section. In some instances, granular or rock embankment will be required for embankment construction for stability purposes, but this special provision does not prevent the use of soil when appropriate. Refer to the plans for specific details regarding material requirements for embankment construction.

Place and compact the pile core and structure granular backfill according to the applicable density requirements for the project. If the embankment and pile core are dissimilar materials (i.e., a granular pile core is used with a soil embankment or a cohesive pile core is used with a granular embankment), a Geotextile Fabric, Type IV, will be required between the pile core and embankment in accordance with Sections 214 and 843 of the Standard Specifications.

When granular or rock embankment is required for embankment construction, conform to the general requirements of Subsection 206.03.02 B. In addition, place the material in no greater than 2-foot loose lifts and compact with a vibrating smooth wheel roller capable of producing a minimum centrifugal force of 15 tons. Apply these requirements to the full width of the embankment for a distance of half the embankment height or 50 feet, whichever is greater, as shown on Standard Drawing RGX-105.

When using granular pile core, install 8-inch perforated underdrain pipe at or near the elevation of the original ground in the approximate locations depicted on the standard drawing, and as the Engineer directs, to ensure positive drainage of the embankment. Wrap the perforated pipe with a fabric of a type recommended by the pipe manufacturer.

After constructing the embankment, excavate for the end bent cap, drive piling, install shafts or other foundation elements, place the mortar bed, construct the end bent, and complete the embankment to finish grade according to the construction sequence shown on the Plans or Standard Drawings and as specified hereinafter.

Certain projects may require widening of existing embankments and the removal of substructures. Construct embankment according to the plans. Substructure removal shall be completed according to the plans and Section 203. Excavation may be required at the existing embankment in order to place the structure granular backfill as shown in the Standard Drawings.

After piles are driven or shafts installed (see design drawings), slope the bottom of the excavation towards the ends of the trench as noted on the plans for drainage. Using a separate pour, place concrete mortar, or any class concrete, to provide a base for forming and placing the cap. Place side forms for the end bent after the mortar has set sufficiently to support workmen and forms without being disturbed.

Install 4-inch perforated pipe in accordance with the plans and Standard Drawings. In the event slope protection extends above the elevation of the perforated pipe, extend the pipe through the slope protection.

After placing the end bent cap and achieving required concrete cylinder strengths, remove adjacent forms and fill the excavation with compacted structure granular backfill material (maximum 1' loose lifts) to the level of the berm prior to placing beams for the bridge. Place Type IV geotextile fabric between embankment material and structure granular backfill. After completing the end bent backwall, or after completing the span end

wall, place the compacted structure granular backfill (maximum 1' loose lifts) to subgrade elevation. If the original excavation is enlarged, fill the entire volume with compacted structure granular backfill (maximum 1' loose lifts) at no expense to the Department. Do not place backfill before removing adjacent form work. Place structure granular backfill material in trench ditches at the ends of the excavation. Place Geotextile Fabric, Type IV over the surface of the compacted structure granular backfill prior to placing aggregate base course.

Tamp the backfill with hand tampers, pneumatic tampers, or other means approved by the Engineer. Thoroughly compact the backfill under the overhanging portions of the structure to ensure that the backfill is in intimate contact with the sides of the structure.

Do not apply seeding, sodding, or other vegetation to the exposed granular embankment.

3.2 Special Construction Methods. Erodible or unstable materials may erode even when protected by riprap or channel lining; use the special construction method described below when using these materials.

Use fine aggregates or friable sandstone granular embankment at "dry land" structures only. Do not use them at stream crossings or locations subject to flood waters.

For erodible or unstable materials having 50 percent or more passing the No. 4 sieve, protect with geotextile fabric. Extend the fabric from the original ground to the top of slope over the entire area of the embankment slopes on each side of, and in front of, the end bent. Cover the fabric with at least 12 inches of non-erodible material.

For erodible or unstable materials having less than 50 percent passing a No. 4 sieve, cover with at least 12 inches of non-erodible material.

Where erodible or unstable granular embankment will be protected by riprap or channel lining, place Type IV geotextile fabric between the embankment and the specified slope protection.

4.0 MEASUREMENT.

4.1 Granular Embankment. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure for payment any Granular Embankment that is not called for in the plans.

The Department will not measure for payment any special construction caused by using erodible or unstable materials and will consider it incidental to the Granular Embankment regardless of whether the erodible or unstable material was specified or permitted.

4.2 Rock Embankment. The Department will not measure for payment any rock embankment and will consider it incidental to roadway excavation or embankment in place, as applicable. Rock embankments will be constructed using granular embankment on projects where there is no available rock present within the excavation limits of the project.

4.3 Pile Core. Pile core will be measured and paid under roadway excavation or embankment in place, as applicable. The Department will not measure the pile core for separate payment. The Department will not measure for payment the 8-inch perforated underdrain pipe and will consider it incidental to the Pile Core.

4.4 Structure Granular Backfill. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure any additional material required for backfill outside the limits shown on the Plans and Standard Drawings for payment and will

consider it incidental to the work.

The Department will not measure for payment the 4-inch perforated underdrain pipe and will consider it incidental to the Structure Granular Backfill.

4.5 Geotextile Fabric. The Department will not measure the quantity of fabric used for separating dissimilar materials when constructing the embankment and pile core and will consider it incidental to embankment construction.

The Department will not measure for payment the Geotextile Fabric used to separate the Structure Granular Backfill from the embankment and aggregate base course and will consider it incidental to Structure Granular Backfill.

The Department will not measure for payment the Geotextile Fabric required for construction with erodible or unstable materials and will consider it incidental to embankment construction.

4.6 End Bent. The Department will measure the quantities according to the Contract. The Department will not measure furnishing and placing the 2-inch mortar or concrete bed for payment and will consider it incidental to the end bent construction.

4.7 Structure Excavation. The Department will not measure structure excavation on new embankments for payment and will consider it incidental to the Structure Granular Backfill or Concrete as applicable.

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

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02223	Granular Embankment	Cubic Yards
02231	Structure Granular Backfill	Cubic Yards

The Department will consider payment as full compensation for all work required in this provision.

September 16, 2016

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

FHWA-1273 -- Revised May 1, 2012

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

2. Subject to the applicability criteria noted in the following sections, 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.

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, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) 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 provisions of the Americans with 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 contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its 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, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program 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 minorities and women.

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 minorities and women 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 minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women 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, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such 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 take corrective 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 its 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 their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

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. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

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 employees who are minorities and women 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 good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 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 good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith 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 contracting agency 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 referrals within the time 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 minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. 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 contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. 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. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. 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 the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

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

(1) The number and work hours 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; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency 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](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics 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 issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, 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 29 CFR 5.5(a)(4). 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. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) 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.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (ii) The classification is utilized in the area by the construction industry; and
- (iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), 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 Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The 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.

(3) In the event the contractor, the laborers or mechanics to be employed in the 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. The Wage and Hour 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.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. 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 shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as 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.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor 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, so 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 contracting agency 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.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of 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. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) 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 shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

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

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each 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 Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) 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 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, 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 FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action 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.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

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 U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or 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 Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen 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 worker 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 on 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 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's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen 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 determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

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 U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman 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 wage rate on the wage determination which provides for less than full fringe benefits for apprentices. 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.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor 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. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. 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.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 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 U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the 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 or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys 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 (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

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 contracting agency. 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 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased 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 or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

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 or propose 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 VI 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 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 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 contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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 provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the 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. 3704).

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.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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, Form FHWA-1022 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:

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 and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

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

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

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

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier 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 first tier 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 first tier 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 contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier 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," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first 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 entering into this transaction.

g. The prospective first tier 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 Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

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 is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective 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.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment 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;

(3) 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 (a)(2) of this certification; and

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

b. Where the prospective 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 Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

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," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

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 exceeding the \$25,000 threshold.

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 is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

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 Participants:

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 participating in covered transactions 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.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is 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 its bid or proposal that the participant 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.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

**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 (forty and above); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age forty (40) and over. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, except that such a notice or advertisement may indicate a preference, limitation, or specification based on religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, when religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, is a bona fide occupational qualification for employment.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual because of his race, color, religion, national origin, sex, disability or age forty (40) and over, in admission to, or employment in any program established to provide apprenticeship or other training.

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

Revised: January 25, 2017

EXECUTIVE BRANCH CODE OF ETHICS

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

KRS 11A.040 (7) provides:

No present or former public servant shall, within six (6) months following termination of his office or employment, accept employment, compensation, or other economic benefit from any person or business that contracts or does business with, or is regulated by, the state in matters in which he was directly involved during the last thirty-six (36) months of his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, or for which he received, prior to his state employment, a professional degree or license, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved during the last thirty-six (36) months of his tenure in state government. This subsection shall not prohibit the performance of ministerial functions, including but not limited to filing tax returns, filing applications for permits or licenses, or filing incorporation papers, nor shall it prohibit the former officer or public servant from receiving public funds disbursed through entitlement programs.

KRS 11A.040 (9) states:

A former public servant shall not represent a person or business before a state agency in a matter in which the former public servant was directly involved during the last thirty-six (36) months of his tenure, for a period of one (1) year after the latter of:

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

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

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

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

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, 3 Fountain Place, Frankfort, Kentucky 40601; telephone (502) 564-7954.

Revised: January 27, 2017

General Decision Number: KY170187 01/06/2017 KY187

Superseded General Decision Number: KY20160187

State: Kentucky

Construction Type: Highway

Counties: Adair, Barren, Bell, Breathitt, Casey, Clay, Clinton, Cumberland, Estill, Floyd, Garrard, Green, Harlan, Hart, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lincoln, Magoffin, Martin, McCreary, Menifee, Metcalfe, Monroe, Morgan, Owsley, Perry, Pike, Powell, Pulaski, Rockcastle, Russell, Taylor, Wayne, Whitley and Wolfe Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017

SUKY2015-047 10/20/2015

	Rates	Fringes
BOILERMAKER.....	\$ 24.65	12.94
BRICKLAYER		
Bricklayer.....	\$ 22.90	8.50
Stone Mason.....	\$ 21.50	8.50
CARPENTER		
Carpenter.....	\$ 24.90	14.50

Piledriver.....	\$ 24.55	14.50
CEMENT MASON.....	\$ 21.25	8.50
ELECTRICIAN		
Electrician.....	\$ 29.36	10.55
Equipment Operator.....	\$ 26.90	10.31
Groundsman.....	\$ 17.79	8.51
Lineman.....	\$ 30.09	10.94

When workmen are required to work from bosum chairs, trusses, stacks, tanks, scaffolds, catwalks, radio and T.V. towers, structural steel (open, unprotected, unfloored raw steel), and bridges or similar hazardous locations where workmen are subject to fall, except where using JLG's and bucket trucks up to 75 feet: Add 25% to workman's base rate for 50 to 75 feet, and add 50% to workman's base rate for over 75 feet.

IRONWORKER.....	\$ 27.56	20.57
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LABORER

Group 1.....	\$ 21.80	12.36
Group 2.....	\$ 22.05	12.36
Group 3.....	\$ 22.10	12.36
Group 4.....	\$ 22.70	12.36

GROUP 1: Aging and Curing of Concrete (Any Mode or Method), Asbestos Abatement Worker, Asphalt Plant Laborers, Asphalt Laborers, Batch Truck Dumpers, Carpenter Tenders, Cement Mason Tenders, Cleaning of Machines, Concrete Laborers, Demolition Laborers, Dredging Laborers, Drill Tender, Environmental Laborer - Nuclear, Radiation, Toxic and Hazardous Waste - Level D, Flagmen, Grade Checkers, All Hand Digging and Hand Back Filling, Highway Marker Placers, Landscaping Laborers, Mesh Handlers and Placers, Puddler, Railroad Laborers, Rip-rap and Grouters, Right of Way Laborers, Sign, Guard Rail and Fence Installers (All Types), Signalmen, Sound Barrier Installer, Storm and Sanitary Sewer Laborers, Swampers, Truck Spotters and Dumpers, Wrecking of Concrete Forms, General Cleanup

GROUP 2: Batter Board Men (Sanitary and Storm Sewer), Brickmason Tenders, Mortar Mixer Operator, Scaffold Builders, Burner and Welder, Bushammers, Chain Saw Operator, Concrete Saw Operators, Deckhand Scow Man, Dry Cement Handlers, Environmental Laborers - Nuclear, Radiation, Toxic and Hazardous Waste - Level C, Forklift Operators for Masonry, Form Setters, Green Concrete Cutting, Hand Operated Grouter and Grinder Machine Operator, Jack Hammers, Lead Paint Abatement, Pavement Breakers, Paving Joint Machine, Pipe Layers - Laser Operators (Non-metallic), Plastic Pipe Fusion, Power Driven Georgia Buggy and Wheel Barrow, Power Post Hole

Diggers, Precast Manhole Setters, Walk-behind Tampers, Walk-behind Trenchers, Sand Blasters, Concrete Chippers, Surface Grinders, Vibrator Operators, Wagon Drillers

GROUP 3: Air Track Driller (All Types), Asphalt Luteman and Rakers, Gunnite Nozzleman, Gunnite Operators and Mixers, Grout Pump Operator, Powderman and Blaster, Side Rail Setters, Rail Paved Ditches, Screw Operators, Tunnel Laborers (Free Air), Water Blasters

GROUP 4: Caisson Workers (Free Air), Cement Finishers, Environmental Laborer - Nuclear, Radiation, Toxic and Hazardous Waste - Level A and B, miners and Drillers (Free Air), Tunnel Blasters, and Tunnel Mockers (Free Air), Directional and Horizontal Boring, Air Track Drillers (All Types), Powder Man and Blasters, Troxler and Concrete Tester if Laborer is Utilized

PAINTER

All Excluding Bridges.....	\$ 19.92	9.57
Bridges.....	\$ 23.92	10.07

PLUMBER.....	\$ 22.52	7.80
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POWER EQUIPMENT OPERATOR:

Group 1.....	\$ 29.95	14.40
Group 2.....	\$ 29.95	14.40
Group 3.....	\$ 27.26	14.40
Group 4.....	\$ 26.96	14.40

GROUP 1: Auto Patrol, Batch Plant, Bituminous Paver, Cable-Way, Clamshell, Concrete Mixer (21 cu ft or over), Concrete Pump, Crane, Crusher Plant, Derrick, Derrick Boat, Ditching and Trenching Machine, Dragline, Dredge Engineer, Elevator (regardless of ownership when used for hoisting any building material), Elevating Grader and all types of Loaders, Hoe-type Machine, Hoisting Engine, Locomotive, LeTourneau or Carry-all Scoop, Bulldozer, Mechanic, Orangepeel Bucket, Piledriver, Power Blade, Roller (Bituminous), Roller (Earth), Roller (Rock), Scarifier, Shovel, Tractor Shovel, Truck Crane, Well Point, Winch Truck, Push Dozer, Grout Pump, High Lift, Fork Lift (regardless of lift height), all types of Boom Cats, Multiple Operator, Core Drill, Tow or Push Boat, A-Frame Winch Truck, Concrete Paver, Grade-All, Hoist, Hyster, Material Pump, Pumpcrete, Ross Carrier, Sheepfoot, Sideboom, Throttle-Valve Man, Rotary Drill, Power Generator, Mucking Machine, Rock Spreader attached to Equipment, Scoopmobile, KeCal Loader, Tower Cranes, (French, German and other types), Hydrocrane, Tugger, Backfiller Gurries, Self-propelled Compactor, Self-Contained Hydraulic Percussion Drill

GROUP 2: All Air Compressors (200 cu ft/min or greater), Bituminous Mixer, Concrete Mixer (21 cu. ft. or over), Welding Machine, Form Grader, Tractor (50 hp and over), Bull Float, Finish Machine, Outboard Motor Boat, Brakeman, Mechanic Tender, Whirly Oiler, Tract-air, Road Widening Trencher, Articulating Trucks

GROUP 3: Greaser on Grease Facilities servicing Heavy Equipment

GROUP 4: Bituminous Distributor, Cement Gun, Conveyor, Mud Jack, Paving Joint Machine, Pump, Tamping Machine, Tractor (under 50 hp), Vibrator, Oiler, Air Compressor (under 200 cu ft per minute), Concrete Saw, Burlap and Curing Machine, Hydro Seeder, Power Form Handling Equipment, Deckhand Oiler, Hydraulic Post Driver

SHEET METAL WORKER.....\$ 20.40 7.80

TRUCK DRIVER

Driver (3 Tons and Over), Driver (Truck Mounted Rotary Drill).....\$ 23.74	14.50
Driver (3 Tons and Under), Tire Changer and Truck Mechanic Tender.....\$ 23.53	14.50
Driver (Semi-Trailer or Pole Trailer), Driver (Dump Truck, Tandem Axle), Driver of Distributor.....\$ 23.40	14.50
Driver on Mixer Trucks (All Types).....\$ 23.45	14.50
Driver on Pavement Breakers.\$ 23.55	14.50
Driver, Euclid and Other Heavy Earth Moving Equipment and Low Boy.....\$ 24.31	14.50
Driver, Winch Truck and A- Frame when used in Transporting Materials.....\$ 23.30	14.50
Greaser on Greasing Facilities.....\$ 24.40	14.50
Truck Mechanic.....\$ 23.50	14.50
Truck Tender and Warehouseman.....\$ 23.20	14.50

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.
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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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

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

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the

most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION

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

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

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

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

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

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

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

OVERTIME:

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

Director
Division of Construction Procurement
Frankfort, Kentucky 40622
502-564-3500

**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
7.0%	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 Clay 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

PROPOSAL BID ITEMS

REVISED ADDENDUM #2: 12-5-17

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Report Date 12/5/17

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE	22,680.00	TON		\$	
0020	00020		TRAFFIC BOUND BASE	500.00	TON		\$	
0030	00100		ASPHALT SEAL AGGREGATE	59.00	TON		\$	
0040	00103		ASPHALT SEAL COAT	8.00	TON		\$	
0050	00190		LEVELING & WEDGING PG64-22	328.00	TON		\$	
0060	00212		CL2 ASPH BASE 1.00D PG64-22	15,185.00	TON		\$	
0070	00301		CL2 ASPH SURF 0.38D PG64-22	4,760.00	TON		\$	
0080	02101		CEM CONC ENT PAVEMENT-8 IN	359.00	SQYD		\$	
0090	24780EC		INTELLIGENT COMPACTION FOR AGGREGATE	42,953.00	TON		\$	
0100	24781EC		INTELLIGENT COMPACTION FOR ASPHALT	42,953.00	TON		\$	
0110	24891EC		PAVE MOUNT INFRARED TEMP EQUIPMENT	545,967.00	SF		\$	
0120	24966EC		RUBBER PAVEMENT 0.5 IN	847.00	SQYD		\$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0390	00078		CRUSHED AGGREGATE SIZE NO 2	1,037.00	TON		\$	
0400	01000		PERFORATED PIPE-4 IN	1,463.00	LF		\$	
0410	01005		PERFORATED PIPE EDGE DRAIN-4 IN	7,978.00	LF		\$	
0420	01006		PERFORATED PIPE EDGE DRAIN-6 IN	572.00	LF		\$	
0430	01010		NON-PERFORATED PIPE-4 IN	469.00	LF		\$	
0440	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM	1.00	LS		\$	
0450	01020		PERF PIPE HEADWALL TY 1-4 IN	19.00	EACH		\$	
0460	01022		PERF PIPE HEADWALL TY 1-8 IN	8.00	EACH		\$	
0470	01028		PERF PIPE HEADWALL TY 3-4 IN	8.00	EACH		\$	
0480	01740		CORED HOLE DRAINAGE BOX CON-4 IN	55.00	EACH		\$	
0490	01741		CORED HOLE DRAINAGE BOX CON-6 IN	1.00	EACH		\$	
0500	01810		STANDARD CURB AND GUTTER	13,096.00	LF		\$	
0510	01875		STANDARD HEADER CURB	1,080.00	LF		\$	
0520	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	72.00	EACH		\$	
0530	02014		BARRICADE-TYPE III	30.00	EACH		\$	
0540	02091		REMOVE PAVEMENT	8,057.00	SQYD		\$	
0550	02159		TEMP DITCH	4,513.00	LF		\$	
0560	02160		CLEAN TEMP DITCH	2,256.00	LF		\$	
0570	02165		REMOVE PAVED DITCH	12.00	SQYD		\$	
0580	02200		ROADWAY EXCAVATION	930,485.00	CUYD		\$	
0590	02242		WATER	342.00	MGAL		\$	
0600	02351		GUARDRAIL-STEEL W BEAM-S FACE	5,912.50	LF		\$	
0610	02360		GUARDRAIL TERMINAL SECTION NO 1	14.00	EACH		\$	
0620	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A	3.00	EACH		\$	
0630	02371		GUARDRAIL END TREATMENT TYPE 7	3.00	EACH		\$	
0640	02381		REMOVE GUARDRAIL	433.00	LF		\$	
0650	02391		GUARDRAIL END TREATMENT TYPE 4A	11.00	EACH		\$	
0660	02429		RIGHT-OF-WAY MONUMENT TYPE 1	121.00	EACH		\$	

PROPOSAL BID ITEMS

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0670	02432		WITNESS POST	3.00	EACH		\$	
0680	02482		CHANNEL LINING CLASS IA	68.00	TON		\$	
0690	02488		CHANNEL LINING CLASS IV	5,563.00	CUYD		\$	
0700	02545		CLEARING AND GRUBBING 49 ACRES	1.00	LS		\$	
0710	02551		CONCRETE-CLASS A FOR STEPS	2.20	CUYD		\$	
0720	02562		TEMPORARY SIGNS	3,445.00	SQFT		\$	
0730	02598		FABRIC-GEOTEXTILE TYPE III	900.00	SQYD		\$	
0740	02599		FABRIC-GEOTEXTILE TYPE IV	52,556.00	SQYD		\$	
0750	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	12,487.00	SQYD	\$2.00	\$	\$24,974.00
0760	02611		HANDRAIL-TYPE A-1	22.00	LF		\$	
0770	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0780	02651		DIVERSIONS (BY-PASS DETOURS) DIVERSION #1	1.00	LS		\$	
0790	02651		DIVERSIONS (BY-PASS DETOURS) DIVERSION #2	1.00	LS		\$	
0800	02671		PORTABLE CHANGEABLE MESSAGE SIGN	4.00	EACH		\$	
0810	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0820	02677		ASPHALT PAVE MILLING & TEXTURING	477.00	TON		\$	
0830	02701		TEMP SILT FENCE	4,513.00	LF		\$	
0840	02703		SILT TRAP TYPE A	49.00	EACH		\$	
0850	02704		SILT TRAP TYPE B	49.00	EACH		\$	
0860	02705		SILT TRAP TYPE C	49.00	EACH		\$	
0870	02706		CLEAN SILT TRAP TYPE A	49.00	EACH		\$	
0880	02707		CLEAN SILT TRAP TYPE B	49.00	EACH		\$	
0890	02708		CLEAN SILT TRAP TYPE C	49.00	EACH		\$	
0900	02720		SIDEWALK-4 IN CONCRETE	7,085.00	SQYD		\$	
0910	02721		REMOVE CONCRETE SIDEWALK	84.00	SQYD		\$	
0920	02726		STAKING	1.00	LS		\$	
0930	02731		REMOVE STRUCTURE COAL HOLLOW RD. BRIDGE	1.00	LS		\$	
0940	02731		REMOVE STRUCTURE GOOSE CREEK BRIDGE	1.00	LS		\$	
0950	02731		REMOVE STRUCTURE KY 2432 HART BRANCH BRIDGE	1.00	LS		\$	
0960	02775		ARROW PANEL	2.00	EACH		\$	
0970	05950		EROSION CONTROL BLANKET	38,917.00	SQYD		\$	
0980	05952		TEMP MULCH	158,155.00	SQYD		\$	
0990	05953		TEMP SEEDING AND PROTECTION	118,616.00	SQYD		\$	
1000	05963		INITIAL FERTILIZER	2.00	TON		\$	
1010	05964		20-10-10 FERTILIZER	10.60	TON		\$	
1020	05985		SEEDING AND PROTECTION	146,640.00	SQYD		\$	
1030	05990		SODDING	18,555.00	SQYD		\$	
1040	05992		AGRICULTURAL LIMESTONE	91.00	TON		\$	
1050	06510		PAVE STRIPING-TEMP PAINT-4 IN	50,249.00	LF		\$	
1060	06514		PAVE STRIPING-PERM PAINT-4 IN	50,249.00	LF		\$	
1070	06566		PAVE MARKING-THERMO X-WALK-12 IN	1,510.00	LF		\$	
1080	06568		PAVE MARKING-THERMO STOP BAR-24IN	322.00	LF		\$	
1090	06569		PAVE MARKING-THERMO CROSS-HATCH	648.00	SQFT		\$	
1100	06574		PAVE MARKING-THERMO CURV ARROW	19.00	EACH		\$	
1110	10020NS		FUEL ADJUSTMENT	232,797.00	DOLL	\$1.00	\$	\$232,797.00
1120	10030NS		ASPHALT ADJUSTMENT	76,472.00	DOLL	\$1.00	\$	\$76,472.00

PROPOSAL BID ITEMS

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1130	20206EC		PAVE MARK HANDICAP SYMBOL	7.00	EACH		\$	
1140	20430ED		SAW CUT	2,326.00	LF		\$	
1150	23158ES505		DETECTABLE WARNINGS	875.00	SQFT		\$	
1160	24489EC		INLAID PAVEMENT MARKER	51.00	EACH		\$	
1170	24540		R/W MONUMENT TYPE 3	11.00	EACH		\$	
1180	24805ED		OBJECT MARKER TYPE 4	3.00	EACH		\$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1200	00440		ENTRANCE PIPE-15 IN	207.00	LF		\$	
1210	00441		ENTRANCE PIPE-18 IN	274.00	LF		\$	
1220	00443		ENTRANCE PIPE-24 IN	254.00	LF		\$	
1230	00461		CULVERT PIPE-15 IN	84.00	LF		\$	
1240	00462		CULVERT PIPE-18 IN	95.00	LF		\$	
1250	00464		CULVERT PIPE-24 IN	460.00	LF		\$	
1260	00466		CULVERT PIPE-30 IN	178.00	LF		\$	
1270	00468		CULVERT PIPE-36 IN	332.00	LF		\$	
1280	00469		CULVERT PIPE-42 IN	52.00	LF		\$	
1290	00470		CULVERT PIPE-48 IN	80.00	LF		\$	
1300	00521		STORM SEWER PIPE-15 IN	2,355.00	LF		\$	
1310	00522		STORM SEWER PIPE-18 IN	1,726.00	LF		\$	
1320	00524		STORM SEWER PIPE-24 IN	735.00	LF		\$	
1330	01202		PIPE CULVERT HEADWALL-15 IN	4.00	EACH		\$	
1340	01204		PIPE CULVERT HEADWALL-18 IN	9.00	EACH		\$	
1350	01208		PIPE CULVERT HEADWALL-24 IN	7.00	EACH		\$	
1360	01210		PIPE CULVERT HEADWALL-30 IN	2.00	EACH		\$	
1370	01212		PIPE CULVERT HEADWALL-36 IN	4.00	EACH		\$	
1380	01216		PIPE CULVERT HEADWALL-48 IN	2.00	EACH		\$	
1390	01396		METAL END SECTION TY 3-42 IN	2.00	EACH		\$	
1400	01410		METAL END SECTION TY 4-15 IN	1.00	EACH		\$	
1410	01432		SLOPED BOX OUTLET TYPE 1-15 IN	3.00	EACH		\$	
1420	01433		SLOPED BOX OUTLET TYPE 1-18 IN	2.00	EACH		\$	
1430	01434		SLOPED BOX OUTLET TYPE 1-24 IN	1.00	EACH		\$	
1440	01450		S & F BOX INLET-OUTLET-18 IN	1.00	EACH		\$	
1450	01451		S & F BOX INLET-OUTLET-24 IN	3.00	EACH		\$	
1460	01452		S & F BOX INLET-OUTLET-30 IN	2.00	EACH		\$	
1470	01456		CURB BOX INLET TYPE A	50.00	EACH		\$	
1480	01496		DROP BOX INLET TYPE 3	2.00	EACH		\$	
1490	01577		DROP BOX INLET TYPE 14	6.00	EACH		\$	
1500	20098NC		CAP BOX INLET	1.00	EACH		\$	
1510	24575ES610		HEADWALL 3X36	2.00	EACH		\$	
1520	24814EC		PIPELINE INSPECTION	4,438.00	LF		\$	

Section: 0004 - BRIDGE-GOOSE CREEK - DRAWING #27581

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1530	02231		STRUCTURE GRANULAR BACKFILL	250.00	CUYD		\$	
1540	02998		MASONRY COATING	957.20	SQYD		\$	
1550	03299		ARMORED EDGE FOR CONCRETE	93.00	LF		\$	
1560	08001		STRUCTURE EXCAVATION-COMMON	134.00	CUYD		\$	
1570	08019		CYCLOPEAN STONE RIP RAP	2,065.00	TON		\$	
1580	08033		TEST PILES	48.00	LF		\$	
1590	08039		PRE-DRILLING FOR PILES	70.00	LF		\$	
1600	08050		PILES-STEEL HP14X73	225.00	LF		\$	
1610	08095		PILE POINTS-14 IN	14.00	EACH		\$	
1620	08100		CONCRETE-CLASS A	276.60	CUYD		\$	
1630	08104		CONCRETE-CLASS AA	655.70	CUYD		\$	
1640	08150		STEEL REINFORCEMENT (REVISED: 12-5-17)	49,919.00	LB		\$	
1650	08151		STEEL REINFORCEMENT-EPOXY COATED	108,849.00	LB		\$	
1660	08633		PRECAST PC I BEAM TYPE 3	968.00	LF		\$	
1670	08635		PRECAST PC I BEAM TYPE 6	873.00	LF		\$	
1680	20637ED		DRILLED SHAFT-ROCK 48 IN	60.00	LF		\$	
1685	20745ED		ROCK SOUNDINGS (ADDED: 12-5-17)	88.00	LF		\$	
1686	20746ED		ROCK CORINGS (ADDED: 12-5-17)	156.00	LF		\$	
1690	21119ED		CONCRETE FORM LINER	732.00	SQYD		\$	
1700	21777EN		DRILLED SHAFT COMMON-54 IN	86.00	LF		\$	
1710	23168ED		CONCRETE STAINING	937.00	SQYD		\$	
1720	23813EC		DECK DRAIN	22.00	EACH		\$	

Section: 0005 - BRIDGE-CULVERT-HART BRANCH - DRAWING #27582

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1730	08001		STRUCTURE EXCAVATION-COMMON	894.00	CUYD		\$	
1740	08002		STRUCTURE EXCAV-SOLID ROCK	277.00	CUYD		\$	
1750	08100		CONCRETE-CLASS A	1,410.00	CUYD		\$	
1760	08150		STEEL REINFORCEMENT	127,845.00	LB		\$	

Section: 0006 - BRIDGE-CULVERT-COAL HOLLOW - DRAWING #27583

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1770	08001		STRUCTURE EXCAVATION-COMMON	432.00	CUYD		\$	
1780	08002		STRUCTURE EXCAV-SOLID ROCK	161.00	CUYD		\$	
1790	08100		CONCRETE-CLASS A	423.00	CUYD		\$	
1800	08150		STEEL REINFORCEMENT	34,039.00	LB		\$	

Section: 0007 - BRIDGE- RETAINING WALL - KY 2432 - DRAWING #27606

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1810	02203		STRUCTURE EXCAV-UNCLASSIFIED	307.00	CUYD		\$	
1820	02555		CONCRETE-CLASS B	352.00	CUYD		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1830	02599		FABRIC-GEOTEXTILE TYPE IV (REVISED: 12-5-17)	460.00	SQYD		\$	
1840	02611		HANDRAIL-TYPE A-1	325.00	LF		\$	
1850	21119ED		CONCRETE FORM LINER	175.00	SQYD		\$	
1860	23168ED		CONCRETE STAINING	211.00	SQYD		\$	
1870	24596EN		GRANULAR BACKFILL	488.00	CUYD		\$	

Section: 0008 - BRIDGE-RETAINING WALL - KY 2432 - DRAWING #27605

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1880	02203		STRUCTURE EXCAV-UNCLASSIFIED	311.00	CUYD		\$	
1885	02555		CONCRETE-CLASS B (ADDED: 12-5-17)	359.00	CUYD		\$	
1890	02611		HANDRAIL-TYPE A-1	195.00	LF		\$	
1900	21119ED		CONCRETE FORM LINER	158.00	SQYD		\$	
1910	23168ED		CONCRETE STAINING	180.00	SQYD		\$	

Section: 0009 - UTILITY-WATER-SEWER-GAS (ADDED: 11-22-17)

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1920	14003		W CAP EXISTING MAIN	2.00	EACH		\$	
1930	14005		W ENCASEMENT CONCRETE	500.00	LF		\$	
1940	14007		W ENCASEMENT STEEL BORED RANGE 2 10 IN	20.00	LF		\$	
1950	14008		W ENCASEMENT STEEL BORED RANGE 3 12 IN	80.00	LF		\$	
1960	14009		W ENCASEMENT STEEL BORED RANGE 4	185.00	LF		\$	
1970	14010		W ENCASEMENT STEEL BORED RANGE 5 24 IN	30.00	LF		\$	
1980	14014		W ENCASEMENT STEEL OPEN CUT RANGE 3 12 IN	295.00	LF		\$	
1990	14016		W ENCASEMENT STEEL OPEN CUT RANGE 5 24 IN	435.00	LF		\$	
2000	14019		W FIRE HYDRANT ASSEMBLY	16.00	EACH		\$	
2010	14028		W METER 3/4 INCH	9.00	EACH		\$	
2020	14030		W METER RELOCATE RECONNECT	1.00	EACH		\$	
2030	14037		W PIPE DUCTILE IRON 08 INCH	4,690.00	LF		\$	
2040	14039		W PIPE DUCTILE IRON 12 INCH	4,320.00	LF		\$	
2050	14060		W PIPE PVC 08 INCH	2,000.00	LF		\$	
2060	14071		W PIPE POLYETHYLENE/PLASTIC 10 INCH	2,235.00	LF		\$	
2070	14073		W PIPE POLYETHYLENE/PLASTIC SPECIAL 18 IN	1,540.00	LF		\$	
2080	14080		W SERV PE/PLST LONG SIDE 3/4 IN	9.00	EACH		\$	
2090	14089		W TAPPING SLEEVE AND VALVE SIZE 1	11.00	EACH		\$	
2100	14090		W TAPPING SLEEVE AND VALVE SIZE 2	4.00	EACH		\$	
2110	14094		W TIE-IN 06 INCH	1.00	EACH		\$	
2120	14095		W TIE-IN 08 INCH	5.00	EACH		\$	
2130	14097		W TIE-IN 12 INCH	4.00	EACH		\$	
2140	14106		W VALVE 08 INCH	12.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2150	14108		W VALVE 12 INCH	1.00	EACH		\$	
2160	14126		W ENCASEMENT SPECIAL 16 IN-DIRECTIONAL BORE	805.00	LF		\$	
2170	14126		W ENCASEMENT SPECIAL 16 IN-OPEN CUT	1,030.00	LF		\$	
2180	14126		W ENCASEMENT SPECIAL 2 IN-DIRECTIONAL BORE	448.00	LF		\$	
2190	14126		W ENCASEMENT SPECIAL 2 IN-OPEN CUT	541.00	LF		\$	
2200	14126		W ENCASEMENT SPECIAL 24 IN -DIRECTIONAL BORE	435.00	LF		\$	
2210	14126		W ENCASEMENT SPECIAL 5 IN-DIRECTIONAL BORE	297.00	LF		\$	
2220	14126		W ENCASEMENT SPECIAL 8 IN-OPEN CUT	165.00	LF		\$	
2230	15051		S FORCE MAIN PE/PLASTIC 04 INCH 4 IN	185.00	LF		\$	
2240	15059		S FORCE MAIN PVC 04 INCH	90.00	LF		\$	
2250	15068		S FORCE MAIN SPECIAL 14 IN	305.00	LF		\$	
2260	15073		S FORCE MAIN TIE-IN 04 INCH	1.00	EACH		\$	
2270	15092		S MANHOLE	13.00	EACH		\$	
2280	15093		S MANHOLE ABANDON/REMOVE	5.00	EACH		\$	
2290	15094		S MANHOLE ADJUST TO GRADE	15.00	EACH		\$	
2300	15112		S PIPE PVC 08 INCH	1,252.00	LF		\$	
2310	15119		S PUMP STATION	1.00	EACH		\$	
2320	15122		S STRUCTURE REMOVAL	1.00	EACH		\$	
2330	16015		G PIPE POLYETHYLENE/PLASTIC 02 INCH	310.00	LF		\$	
2340	16048		G TIE-IN SPECIAL	2.00	EACH		\$	
2350	16049		G VALVE POLYETHYLENE/PLASTIC 02 INCH	2.00	EACH		\$	
2360	16056		G VALVE SPECIAL	4.00	EACH		\$	
2370	16057		G VALVE STEEL 02 INCH	4.00	EACH		\$	
2380	16110		G PIPE POLYETHYLENE/PLASTIC 01 INCH	235.00	LF		\$	
2390	21233ED		ASPHALT PAVING REPLACEMENT	430.00	LF		\$	
2400	23667EC		WATER MAIN CREEK CROSSING 16 IN	240.00	LF		\$	
2410	23667EC		WATER MAIN CREEK CROSSING 24 IN	480.00	LF		\$	
2420	24441EC		GRAVEL REPLACEMENT DRIVEWAYS	130.00	LF		\$	

Section: 0010 - SIGNALIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0130	04792		CONDUIT-1 IN	50.00	LF		\$	
0140	04795		CONDUIT-2 IN	200.00	LF		\$	
0150	04820		TRENCHING AND BACKFILLING	100.00	LF		\$	
0160	04830		LOOP WIRE	1,650.00	LF		\$	
0170	04844		CABLE-NO. 14/5C	2,700.00	LF		\$	
0180	04850		CABLE-NO. 14/1 PAIR	1,000.00	LF		\$	
0190	04885		MESSENGER-10800 LB	400.00	LF		\$	
0200	04895		LOOP SAW SLOT AND FILL	620.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0210	04931		INSTALL CONTROLLER TYPE 170	1.00	EACH		\$	
0220	04932		INSTALL STEEL STRAIN POLE	4.00	EACH		\$	
0230	20093NS835		INSTALL PEDESTRIAN HEAD-LED	8.00	EACH		\$	
0240	20188NS835		INSTALL LED SIGNAL-3 SECTION	8.00	EACH		\$	
0250	20266ES835		INSTALL LED SIGNAL- 4 SECTION	2.00	EACH		\$	
0260	21743NN		INSTALL PEDESTRIAN DETECTOR	8.00	EACH		\$	
0270	23157EN		TRAFFIC SIGNAL POLE BASE	17.00	CUYD		\$	
0280	23235EC		INSTALL PEDESTAL POST	4.00	EACH		\$	
0290	23982EC		INSTALL ANTENNA	1.00	EACH		\$	
0300	24955ED		REMOVE SIGNAL EQUIPMENT	1.00	EACH		\$	

Section: 0011 - LIGHTING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0310	04740		POLE BASE	14.00	EACH		\$	
0320	04795		CONDUIT-2 IN	340.00	LF		\$	
0330	04820		TRENCHING AND BACKFILLING	2,600.00	LF		\$	
0340	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	6.00	EACH		\$	
0350	21543EN		BORE AND JACK CONDUIT	200.00	LF		\$	
0360	24901EC		PVC CONDUIT-2 IN-SCHEDULE 80	2,800.00	LF		\$	

Section: 0012 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0370	02568		MOBILIZATION	1.00	LS		\$	
0380	02569		DEMOBILIZATION	1.00	LS		\$	

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SPECIAL NOTE FOR DRILLED SHAFTS

1.0 DESCRIPTION. Furnish all equipment, materials and labor necessary for constructing reinforced concrete drilled shafts in cylindrically excavated holes according to the details shown on the plans or as the Engineer directs. Construct the shaft to the lines and dimensions shown on the plans, or as the Engineer directs. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

2.0 MATERIALS.

2.1 Concrete. Use Class A Modified concrete unless otherwise shown on the plans. The slump at the time of placement shall be 6.5 to 9.5 inches, the coarse aggregate shall be size 67, 68, 78, 8 or 9M, and the water/cementitious material ratio shall not exceed 0.45. Include water reducing and retarding admixtures. Type F high range water reducers used in combination with retarding admixtures or Type G high range water reducers fully meeting trial batch requirements are permitted and Class F fly ash is permitted in conformance with Section 601. Design the mix such that the concrete slump exceeds 4 inches at 4 hours after batching. If the estimated concrete transport, plus time to complete placement, exceeds 4 hours, design the concrete to have a slump that exceeds 4 inches or more for the greater time after batching and demonstrate that the slump requirement can be achieved after the extended time period using a trial batch.

Perform trial batches prior to beginning drilled shaft construction in order to demonstrate the adequacy of the proposed concrete mix. Demonstrate that the mix to be used will meet the requirements for temperature, slump, air content, water/cementitious material ratio, and compressive strength. Use the ingredients, proportions and equipment (including batching, mixing, and delivery) to be used on the project. Make at least 2 independent consecutive trial batches of 3 cubic yards each using the same mix proportions and meeting all specification requirements for mix design approval. Submit a report containing these results for slump, air content, water/cement ratio, temperature, and compressive strength and mix proportions for each trial batch to the Engineer for review and approval. Failure to demonstrate the adequacy of the concrete mix, methods, or equipment to the Engineer is cause for the Engineer to require appropriate alterations in concrete mix, equipment, and/or method by the Contractor to eliminate unsatisfactory results. Perform additional trial batches required to demonstrate the adequacy of the concrete mix, method, or equipment.

2.2 Steel Reinforcement. Provide Grade 60 deformed bars conforming to Section 811 of the Standard Specifications. Rail steel is permitted for straight bars only. Place according to Section 602 of the Standard Specifications, this Special Note, and the plans. Use non-corrosive centering devices and feet to maintain the specified reinforcement clearances.

2.3 Casings. Provide casing meeting the requirements of ASTM A 252 Grade 2 or better unless otherwise specified. Ensure casing is smooth, clean, watertight, true and straight, and of ample strength to withstand handling, installation, and extraction stresses and the pressure of both concrete and the surrounding earth materials. Ensure the outside diameter of casing is not less than the specified diameter of shaft.

Use only continuous casings. Cut off the casing at the prescribed elevation and trim to within tolerances prior to acceptance. Extend casing into bedrock a sufficient distance to stabilize the shaft excavation against collapse, excessive deformation, and/or flow of water if required and/or shown on the plans.

Install from the work platform continuous casing meeting the design thickness requirements, but not less than 3/8 inch, to the elevations shown on the plans. When drilled

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shafts are located in open water areas, extend casings above the water elevation to the plan tip elevation to protect the shaft concrete from water action during concrete placement and curing. All casing is permanent unless temporary casing is specified in the contract drawings or documents. Permanent casing is incidental to the applicable drilled shaft unit bid price unless noted otherwise in the contract. Temporary casing may be required for drilled shafts not socketed into bedrock. If temporary surface casings are used, extend each casing up to the work platform. Remove all temporary surface casing prior to final acceptance unless otherwise permitted by the Central Office Construction Engineer.

Ensure casing splices have full penetration butt welds conforming to the current edition of AWS D1.1 with no exterior or interior splice plates and produce true and straight casing.

2.4 Slurry. When slurry is to be used for installation of the Drilled Shaft, submit a detailed plan for its use and disposal. The plan should include, but not be limited to the following:

- 1) Material properties
- 2) Mixing requirements and procedures
- 3) Testing requirements
- 4) Placement procedures
- 5) Disposal techniques

Obtain the Central Office Division of Construction's approval for the slurry use and disposal plan before installing drilled shafts.

2.5 Tremies. Provide tremies of sufficient length, weight, and diameter to discharge concrete at the shaft base elevation. Ensure the tremie diameter is least 6 times the maximum size coarse aggregate to be used in the concrete mix and no less than 10 inches. Provide adequate wall thickness to prevent crimping or sharp bends that restrict concrete placement. Support tremies used for depositing concrete in a dry drilled shaft excavation so that the free fall of the concrete does not cause the shaft excavation to cave or slough. Maintain a clean and smooth tremie surface to permit both flow of concrete and unimpeded withdrawal during concrete placement. Do not allow any aluminum parts to contact the concrete. Construct tremies used to deposit concrete for wet excavations so that they are watertight and will readily discharge concrete.

2.6 Concrete Pumps. Provide pump lines with a minimum diameter of 5 inches and watertight joints.

2.7 Drop Chutes. Do not use aluminum drop chutes.

3.0 CONSTRUCTION.

3.1 Preconstruction.

3.1.1 Prequalification. The Department will require prequalification by the Division of Construction Procurement before accepting a bid for the construction of Drilled Shafts.

3.1.2 Pre-Bid Inspection. Inspect both the project site and all subsurface information, including any soil or rock samples, prior to submitting a bid. Contact the Geotechnical Branch (502-564-2374) to schedule a viewing of the subsurface information. Failure to inspect the project site and view the

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subsurface information will result in the forfeiture of the right to file a claim based on site conditions and may result in disqualification from the project.

3.1.3 Drilled Shaft Installation Plan. Upon request, the Department will review a Drilled Shaft Installation Plan. Submit the plan no later than 45 calendar days prior to constructing drilled shafts. Items covered in this plan should include, but not be limited to the following:

- 1) Name and experience record of jobsite drilled shaft superintendent and foremen in charge of drilled shaft operations for each shift.
- 2) List and size of proposed equipment including cranes, drills, augers, bailing buckets, final cleaning equipment, de-sanding equipment, slurry pumps, core sampling equipment, tremies or concrete pumps, casings, etc.
- 3) Details of overall construction operation sequence and the sequence of shaft construction in the bents or groups.
- 4) Details of shaft excavation methods including methods to over-ream or roughen shaft walls, if necessary.
- 5) Details of slurry when the use of slurry is anticipated. Include methods to mix, circulate, and de-sand the proposed slurry. Provide details of proposed testing, test methods, sampling methods, and test equipment.
- 6) Details of proposed methods to clean shaft and inside of casing after initial excavation.
- 7) Details of reinforcement handling, lifting, and placement including support and method to center in shaft. Also include rebar cage support during concrete placement and temporary casing removal.
- 8) Details of concrete placement including procedures for concrete tremie or pump. Include initial placement, raising during placement, and overfilling of the shaft to expel contaminated concrete.
- 9) Required submittals including shop drawings and concrete design mixes.
- 10) Other information shown in the plans or requested by the Engineer.
- 11) Special considerations for wet construction.
- 12) Details of environmental control procedures to protect the environment from discharge of excavation spoil, slurry (natural and mineral), and concrete over-pour.

The Division of Construction will review the submitted procedure and provide comments and recommendations. The Contractor is responsible for satisfactory construction and ultimate performance of the Drilled Shaft.

3.2 General Construction. Construct drilled shafts as indicated in the plans or described in this Special Note by either the dry or wet method. When the plans describe a particular method of construction, use this method unless the Engineer permits otherwise. When the plans do not describe a particular method, propose a method on the basis of its suitability to the site conditions. Approval of this proposed method is contingent upon the satisfactory results of the technique shaft.

The construction of the first drilled shaft or technique shaft will be used to determine if the methods and equipment used by the contractor are sufficient to produce a completed shaft meeting the requirements of the plans and specifications. Ability to control dimensions and alignment of excavations within tolerances; to seal the casing into impervious materials; to prevent caving or deterioration of subsurface materials by the use of slurry or other means; to

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properly clean the completed shaft excavation; to construct excavations in open water areas when required by the plans; to establish methods for bellling or over-reaming when required by the plans; to determine the elevation of ground water; to satisfactorily handle, lift, place, and support the reinforcement cage; to satisfactorily place concrete meeting the specifications within the prescribed time frame; and to satisfactorily execute any other necessary construction operations will be evaluated during construction of the first shaft(s). Revise the methods and equipment as necessary at any time during the construction of the first shaft when unable to satisfactorily carry out any of the necessary operations described above or unable to control the dimensions and alignment of the shaft excavation within tolerances. Accurately locate technique so they may be used in the finished structure unless directed otherwise in the contract document or by the Engineer.

If at any time the Contractor fails to satisfactorily demonstrate, to the satisfaction of the Engineer, the adequacy of methods or equipment and alterations are required, additional technique shafts will be required at no additional cost to the Department and with no extension of contract time. Additional technique shafts shall be located as near as possible to the proposed production shafts but in a location as not to interfere with other construction activities. Once approval has been given to construct production shafts, no changes will be permitted in the methods or equipment used to construct the satisfactory shaft without written approval of the Engineer.

Do not make a claim against the Department for costs of construction delays, or any materials, labor, or equipment that may be necessary due to the Contractor's failure to furnish drilled shafts of a length sufficient to obtain the required bearing values, or for variations in length due to subsurface conditions that may be encountered. Soundings, boring logs, soil profiles, or other subsurface data included in the Contract documents are used by the Department for design and making preliminary estimates of quantities and should be used only at the risk of the Contractor for determining equipment, materials, or labor necessary for drilling shafts as required by the contract.

When necessary, set temporary removable surface casing. Use surface casing of sufficient length to prevent caving of the surface soils and to aid in maintaining shaft position and alignment. Pre-drilling with slurry and/or over-reaming to the outside diameter of the casing may be required to install the surface casing at some sites.

Provide equipment capable of constructing shafts to the deepest shaft depth shown in the plans plus 15 feet, 20 percent greater than the longest shaft (measured from the ground or water surface to the tip of the shaft), or 3 times the shaft diameter, whichever is greater. Blasting excavation methods are not permitted.

Use permanent casing unless otherwise noted in the Contract. Place casing as shown on the plans before beginning excavation. If full penetration cannot be attained, the Engineer may direct that excavation through the casing be accomplished and the casing advanced until reaching the plan tip elevation. In some cases, over-reaming to the outside diameter of the casing may be required before placing the casing. Cut off the casing at the prescribed elevation and leave the remainder of the casing in place. Do not use vibratory hammers for casing installation within 50 feet of shafts that have been completed less than 24 hours.

3.2.1 Dry Construction Method. Use the dry construction method only at sites where the ground water table and soil conditions (generally stiff to hard clays or rock above the water table) make it feasible to construct the shaft in a relatively dry excavation and where the sides and bottom of the shaft are stable and may be visually inspected by the Engineer prior to placing the concrete. The dry construction method consists of drilling the shaft excavation, removing accumulated seepage water and loose material from the excavation, and placing the shaft concrete in a relatively dry excavation.

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3.2.2 Wet Construction Method. Use the wet construction method at all sites where it is impractical to excavate by the dry method. The wet construction method consists of drilling the shaft excavation below the water table, keeping the shaft filled with water (including natural slurry formed during the drilling process) or slurry as defined in part 2.4 of this Special Note, desanding and cleaning the slurry as required, final cleaning of the excavation by means of a bailing bucket, air lift, submersible pump or other approved devices and placing the shaft concrete (with a tremie or concrete pump beginning at the shaft bottom) which displaces the water or slurry as concrete is placed.

Where drilled shafts are located in open water areas, construct the shafts by the wet method using casings extending from above water elevation to the plan casing tip elevation to protect the shaft concrete from water action during placement and curing. Install the casing in a manner that will produce a positive seal at the bottom of the casing.

3.3 Slurry. When the Contractor elects to use slurry, adjust construction operations so that the slurry is in contact with the bottom 5 feet of the shaft for less than 4 hours unless the Engineer approves otherwise. If the 4-hour limit is exceeded, over-ream the bottom 5 feet of shaft.

3.4 Cleaning. Over-reaming, cleaning, or wire brushing the sidewalls of the shaft excavation and permanent casings may be necessary to remove the depth of softening or to remove excessive slurry cake buildup as indicated by sidewall samples or other test methods employed by the Engineer. Over-ream around the perimeter of the excavation a minimum depth of 1/2 inch and maximum depth of 3 inches.

3.5 Subsurface Exploration. Take subsurface exploration borings when shown on the plans or as the Engineer directs to determine the character of the material that the shaft extends through and the material directly below the shaft excavation. Complete subsurface exploration borings prior to beginning excavation for any drilled shaft in a group. Unless directed otherwise, extend subsurface exploration borings a minimum depth of 3 shaft diameters but not less than 10 feet below the bottom of the anticipated tip of drilled shaft excavation as shown on the plans. For subsurface exploration borings where soil sampling is required use thin-wall tube samples and perform standard penetration tests according to the Department's current Geotechnical Manual. When shafts extend into bedrock, soil samples are not required unless otherwise specified. Perform rock core drilling according to the Department's Geotechnical Manual. When the Engineer directs, perform additional subsurface exploration borings prior to drilled shaft construction. Measure soil samples and/or rock cores and visually identify and describe them on the subsurface log according to the Department's current Geotechnical Manual. Subsurface exploration borings must be performed by contractors/consultants prequalified by the Department's Division of Professional Services for Geotechnical Drilling Services at the time that field work begins.

The Engineer or geotechnical branch representative may be on-site during the subsurface exploration process to evaluate the soil and/or rock core samples. The Engineer or geotechnical branch representative will determine the need to extend the borings to depths greater than the depths previously specified. Handle, label, identify, and store soil and/or rock samples according to the Department's current Geotechnical Manual and deliver them with the subsurface logs to the geotechnical branch's rock core lab in Frankfort within 24-hours of completing the borings, unless directed otherwise.

The Engineer will inspect the soil samples and/or cores and determine the final depth of required excavation (final drilled shaft tip elevation) based on evaluation of the material's suitability. The Engineer will establish the final tip elevations for shaft locations, other than

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those for which subsurface exploration borings have been performed, based on the results of the subsurface exploration. Within 15 calendar days after completion of the subsurface exploration borings, the Engineer will notify the contractor of the final tip elevations for shaft locations.

3.6 Excavations. The plans indicate the expected depths, the top of shaft elevations, and the estimated bottom of shaft elevations between which the drilled shaft are to be constructed. Drilled shafts may be extended deeper when the Engineer determines that the material encountered while drilling the shaft excavation is unsuitable and/or is not the same as anticipated in the design of the drilled shaft. Drilled shafts may be shortened when the Engineer determines the material encountered is better than that anticipated.

Begin drilled shaft excavation the excavation, excavation inspection, reinforcement placement, and concrete placement can be completed as one continuous operation. Do not construct new shafts within 24 hours adjacent to recently completed shafts if the center-to-center spacing is less than 3 shaft diameters.

Dispose of excavated material removed from the shaft according to the Standard Specifications or the contract documents.

Do not allow workmen to enter the shaft excavation for any reason unless both a suitable casing has been installed and adequate safety equipment and procedures have been provided to the workmen entering the excavation. Recommended Procedures for the Entry of Drilled Shaft Foundation Excavations, prepared by ADSC: The International Association of Foundation Drilling provides guideline recommendations for down-hole entry of drilled excavations.

3.7 Obstructions. Remove subsurface obstructions at drilled shaft locations. Such obstructions may include man-made materials such as old concrete foundations or natural materials such as boulders. Blasting is not permitted.

3.8 Inspections of Excavations. Provide equipment for checking the dimensions and alignment of each shaft excavation. Determine the dimensions and alignment of the shaft excavation under the observation and direction of the Engineer. Provide equipment necessary to verify shaft cleanliness for the method of inspection selected by the Engineer.

Measure final shaft depths with a weighted tape or other approved methods after final cleaning. Ensure the base of each shaft has less than ½ inch of sediment at the time of concrete placement. For dry excavations, do not allow the depth of water to exceed 3 inches for tremie or pump methods of concrete placement. Verify shaft cleanliness to the Engineer using direct visual inspection or other method the Engineers determines acceptable. Video camera or underwater inspection procedures may be used if specified in the plans. Inspect the side surfaces of rock sockets to ensure they are rough and of such condition to ensure bond between the shaft concrete and the rock. Calipers, bent rods, or other devices may be used to inspect the diameter and roughness of rock sockets. When the Engineer directs, mechanically roughen surfaces found to be smooth.

3.9 Reinforcing Steel Cage Fabrication and Placement. Assemble the reinforcing steel cage, consisting of longitudinal bars, ties, spirals, cage stiffener bars, spacers, centering devices, and other necessary appurtenances and place as a prefabricated unit immediately after the shaft excavation is inspected and accepted, and just prior to concrete placement.

Tie the reinforcing steel with 100 percent double-wire ties and provide support so that it will remain within allowable tolerances for position. Locate splices as shown on the plans. Splice no more than 50 percent of the longitudinal reinforcing within 2-lap splice lengths of any location or within 3 feet of the splice location if approved mechanical connectors are used. All splices are to be in accordance with plan details. Use bands, temporary cross ties,

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etc. as required to provide a reinforcement cage of sufficient rigidity to prevent racking, permanent deformations, etc. during installation.

Use concrete centering devices or other approved non-corrosive centering devices at sufficient intervals along the length of the reinforcement cage to ensure concentric spacing for the entire cage length. As a minimum, provide a set of non-corrosive centering devices at intervals not exceeding 5 feet throughout the length of the shaft. When the size of the longitudinal reinforcement exceeds one inch in diameter the minimum spacing may be increased to 10 feet. As a minimum, provide a set of centering devices within 2 feet of the top and 2 feet of the bottom of the shaft. In addition provide one set of centering devices 2 feet above and 2 feet below each change in shaft diameter. Provide feet (bottom supports) at the bottom of the shaft on vertical bars. As a minimum, provide non-corrosive centering devices at 60 degree intervals around the circumference of the shaft to maintain the required reinforcement clearances. Ensure the centering devices maintain the specified annular clearance between the outside of the reinforcing cage and the side of the excavated hole or casing.

Concrete centering devices and feet will be constructed of concrete equal in quality and durability to the concrete specified for the shaft. Use epoxy coated centering devices fabricated from reinforcing steel. Use feet (bottom supports) of adequate size and number to assure the rebar cage is the proper distance above the bottom as determined by part 3.11 3) of this Special Note. The feet are not intended to support the weight of the cage. In the event that the shaft has been excavated below the anticipated tip elevation, extend the reinforcing cage at the tip (low) end by lap splices, mechanical connectors, or welded splices conforming to the Standard Specifications. In this instance, splices need not be staggered and 100 percent of the reinforcing bars may be spliced at a given location. The bottom 12 inches of the shaft may not be reinforced when below plan tip elevation.

During concrete placement, support the reinforcing cage at or near the top of shaft such that the concrete feet are positioned approximately one inch above the bottom of shaft excavation. Not sooner than 24 hours after the completion of concrete placement, remove temporary supports. Provide the needed equipment, including extra cranes if necessary, to provide this cage support.

Prior to placing the reinforcement cage, demonstrate to the satisfaction of the Engineer that the fabrication and handling methods to be used will result in a reinforcing cage placed in the proper position, with the proper clearances, and without permanent bending, squashing, or racking of the reinforcement cage. During this demonstration bring the cage to an upright position, lower into a shaft excavation, and support as if for concrete placement.

Check the elevation of the top of the reinforcing cage before and after the concrete is placed. If the reinforcing cage is not maintained within the specified tolerances, correct to the satisfaction of the Engineer. Do not construct additional shafts until the contractor has modified his reinforcing cage support to obtain the required tolerances.

3.10 Concrete Placement. Place concrete according to the applicable portions of the Standard Specifications and with the requirements set forth herein. Do not apply the provisions of the Special Note 6U for Structural Mass Concrete.

Place concrete as soon as practical after reinforcing steel placement but no later than 4 hours after completion of the shaft excavation. Place concrete continuously from the bottom to above the top elevation of the shaft. For shafts that extend above ground or water surface, place concrete continuously after the shaft is full until good quality concrete is evident at the top of the shaft. Form any portion of the shaft above ground with a removable form or other approved method to the dimensions shown on the plans.

For shafts constructed in the wet with the top of the shaft below the water surface and below top of casing, place concrete to approximately one shaft diameter but no less than 2 feet above the top of shaft elevation. Remove contaminated concrete and deleterious material, as

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determined by the Engineer, accumulated above the top of shaft elevation immediately after completing concrete placement. Deleterious material and contaminated concrete may be airlifted under a head of water or slurry provided that the head is maintained at or near the exterior water surface elevation. Carefully remove any concrete remaining above plan top of shaft after curing and excess casing removal.

Place concrete either by free fall, through a tremie, or concrete pump. Use the free fall placement method in dry holes only. The maximum height of free fall placement is 20 feet. Do not allow concrete placed by free fall to contact either the reinforcing cage or hole sidewall. Drop chutes may be used to direct concrete to the base during free fall placement.

Place concrete in the shaft in one continuous operation. Maintain a minimum slump of 4 inches or more throughout the placement for 4 hours after batching. Adjust approved admixtures in the concrete mix for the conditions encountered on the job so that the concrete remains in a workable plastic state throughout the placement. Perform slump loss tests to demonstrate that the concrete will maintain a 4-inch or greater slump for a period of time equal to the estimated transport plus the 2-hour placement time, but not less than 4 hours.

When the Engineer determines the concrete placement methods and/or equipment during construction of any technique and/or production shafts to be inadequate, make appropriate alterations to eliminate unsatisfactory results.

Drilled shafts not meeting the concrete placement requirements of this Special Note or contract plans are unacceptable. Correct all unacceptable completed shafts to the satisfaction of the Engineer.

3.10.1 Tremie Placement. Tremies may be used for concrete placement in either wet or dry holes. Extend the tremie to the shaft base elevation before starting underwater placement. Valves, bottom plates, or plugs may be used only if concrete discharge can begin approximately 2 inches above the excavation bottom. Remove plugs from the excavation unless otherwise approved by the Engineer. Maintain tremie discharge at or near the bottom of excavation as long as practical during concrete placement. Immerse tremie discharge end as deep as practical in the concrete but not less than 10 feet.

If at any time during the concrete pour the tremie line orifice is removed from the fluid concrete column and discharges concrete above the rising concrete surface, the entire drilled shaft is considered defective. In such case, remove the reinforcing cage and concrete, complete any necessary sidewall cleaning or over-reaming as directed by the Engineer, and repour the shaft.

3.10.2 Pumped Concrete. Concrete pumps and lines may be used for concrete placement in either wet or dry excavations. Do not begin concrete placement until the pump line discharge orifice is at the shaft base elevation.

For wet excavations, use a plug or similar device to separate the concrete from the fluid in the hole until pumping begins. Remove the plug unless otherwise approved by the engineer.

Ensure the discharge orifice remains at least 10 feet below the surface of the fluid concrete. When lifting the pump line during concrete placement, reduce the line pressure until the orifice has been repositioned at a higher level in the excavation.

If at any time during the concrete pour the pump line orifice is removed from the fluid concrete column and discharges concrete above the rising concrete level, the Department will consider the shaft defective. In such case, remove the reinforcing cage and concrete, complete any necessary sidewall cleaning or over-reaming as the Engineer directs, and repour the shaft.

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3.10.3 Drop Chutes. Drop chutes may be used to direct placement of free fall concrete in excavations where the maximum depth of water does not exceed one inch. Do not use the free fall method of placement in wet excavations. Concrete may be placed through either a hopper at the top of the tube or side openings as the drop chute is retrieved during concrete placement. Reduce the height of free fall and/or reduce the rate of concrete flow into the excavation if the concrete placement causes the shaft excavation to cave or slough, or if the concrete strikes the reinforcing cage or sidewall. When the Engineer determines free fall placement cannot be accomplished satisfactorily, use either tremie or pumping to accomplish the pour.

3.11 Construction Tolerances. The following construction tolerances apply to drilled shafts unless otherwise stated in the contract document:

- 1) Construct drilled shaft within 3 inches of plan position in the horizontal plane at the top of the shaft.
- 2) Do not vary the vertical alignment of a shaft excavation from the plan alignment by more than 1/4 inch per foot of depth or 6 inches total.
- 3) Maintain the top of the reinforcing steel cage no more than 6 inches above and no more than 3 inches below plan position.
- 4) All casing diameters shown on the plans refer to O.D. (outside diameter) dimensions. The casing dimensions are subject to American Pipe Institute tolerances applicable to regular steel pipe. A casing larger in diameter than shown in the plans may be used, at no additional cost, with prior approval by the Department.
- 5) Maintain the top of shaft concrete within ± 3 inches from the plan top of shaft elevation, measured after excess shaft concrete has been removed.
- 6) Design excavation equipment and methods so that the completed shaft excavation will have a planar bottom. Maintain the cutting edges of excavation equipment normal to the vertical axis of the equipment within a tolerance of $\pm 3/8$ inch per foot of diameter. The tip elevation of the shaft has a tolerance of ± 6 inches from final shaft tip elevation unless otherwise specified in the plans.

Drilled shaft excavations and completed shafts not constructed within the required tolerances are unacceptable. Correct all unacceptable shaft excavations and completed shafts to the satisfaction of the Engineer. When a shaft excavation is completed with unacceptable tolerances, present corrective measures designed by a registered Professional Engineer for approval.

4.0 MEASUREMENT.

4.1 Drilled Shafts. The Department will not measure for payment any trial batches required to demonstrate the adequacy of the concrete mix, method, or equipment; concrete required to fill an oversized casing or oversized excavation; obstruction removal; over-reaming or sidewall cleaning; inspection work or inspection equipment; materials or work necessary, including engineering analyses and redesign, to alter unacceptable work methods or to complete corrections for unacceptable work; and will consider them incidental to the Drilled Shaft. Unless noted otherwise in the contract documents, casing is incidental to the drilled shaft.

4.1.1 Drilled Shaft, Common. The Department will measure the length, in linear feet, of drilled shaft above the top of rock elevation shown on the plans. The

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Department will consider this quantity Drilled Shaft, Common regardless of the character of material actually encountered.

4.1.2 Drilled Shafts, Solid Rock. The Department will measure the length, in linear feet, of drilled shaft below the top of rock elevation shown on plans. The Department will consider this quantity Drilled Shafts, Solid Rock regardless of the character of material actually encountered during excavation.

4.2 Technique Shaft. The Department will pay for technique shaft at the contract unit price per each as detailed on the plans or as directed by the Engineer. This will constitute full compensation for all costs incurred during installation as described herein for 'Drilled Shaft' or in the contract documents. No additional compensation beyond the number of technique shafts allowed for in the plans will be permitted for additional technique shafts required because of failure to demonstrate adequacy of methods.

4.3 Rock Coring and Rock Sounding. The Department will measure Rock Sounding and Rock Coring shown on the plans, as specified in part 3.5 of this Special Note, and as the Engineer directs, in linear feet to the nearest 0.1-foot. If soil samples are specified in the contract documents they will be incidental to the unit price bid for Rock Sounding. The Department will not measure or pay for subsurface exploration performed deeper than the elevations indicated on the plans and/or in this Special Note, unless directed by the Engineer, and will consider it incidental to these items of work. Additionally, the Department will consider all mobilization, equipment, labor, incidental items, and operations necessary to complete the boring operations incidental to these items of work.

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

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
----	Drilled Shaft, Diameter*, Common	Linear Foot
----	Drilled Shaft, Diameter*, Solid Rock	Linear Foot
----	Technique Shaft	Each
20745ED	Rock Sounding	Linear Foot
20746ED	Rock Coring	Linear Foot

* See Plan Sheets for sizes of shafts.

The Department will consider payment as full compensation for all work required in this note.

June 15, 2012