CALL NO. 100

CONTRACT ID. 201305

PULASKI COUNTY

FED/STATE PROJECT NUMBER NHPP 4611 (009)

DESCRIPTION SOMERSET - MT VERNON ROAD (KY 461)

WORK TYPE GRADE, DRAIN & SURFACE WITH BRIDGE

PRIMARY COMPLETION DATE 6/1/2023

LETTING DATE: September 25,2020

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 am EASTERN DAYLIGHT TIME September 25,2020. Bids will be publicly announced at 10:00 am EASTERN DAYLIGHT TIME.

PLANS AVAILABLE FOR THIS PROJECT.

DBE CERTIFICATION REQUIRED - 11%

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

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PART I

SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 08

CONTRACT ID - 201305

NHPP 4611 (009)

COUNTY - PULASKI

PCN - DE10004612005
NHPP 4611 (009)

SOMERSET - MT VERNON ROAD (KY 461) IMPROVE KY461 FROM KY80 TO BUCK CREEK BRIDGE, INCLUDING INTERCHANGE AT KY 80, A DISTANCE OF 04.62 MILES.GRADE, DRAIN & SURFACE WITH BRIDGE SYP NO. 08-00059.25.

GEOGRAPHIC COORDINATES LATITUDE 37:10:35.00 LONGITUDE 84:28:59.00

COMPLETION DATE(S):

COMPLETED BY 06/01/2023 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 electronic bidding software. 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.

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.

April 30, 2018

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 Rating	102.08 Preparation and Delivery of Proposals
102.13 Irregular Bid Proposals	102.14 Disqualification of Bidders
102.09 Proposal Guaranty	

CIVIL RIGHTS ACT OF 1964

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

NOTICE TO ALL BIDDERS

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

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

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

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 Proposal Line Number, 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, along with the DBE's certificate of insurance. If the DBE is a supplier of materials for the project, a signed purchase order 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 (hard copy along with an electronic copy) of this information must be received in the Division of Contract Procurement no later than 12:00 noon of the tenth calendar day after receipt of notification that they are the apparent low bidder.

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

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

1. Whether the bidder attended any pre-bid meetings that were scheduled by the Cabinet to inform DBEs of subcontracting opportunities;
2. Whether the bidder provided solicitations through all reasonable and available means;
3. Whether the bidder provided written notice to all DBEs listed in the DBE directory at the time of the letting who are prequalified in the areas of work that the bidder will be subcontracting;
4. Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainly whether they were interested. If a reasonable amount of DBEs within the targeted districts do not provide an intent to quote or no DBEs are prequalified in the subcontracted areas, the bidder must notify the Disadvantaged Enterprise Business Liaison Officer (DEBLO) in the Office of Civil Rights and Small Business Development 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 of Subcontractor Payment (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 completed and signed within 7 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.

********* IMPORTANT *********

Please mail the original, signed and completed TC (18-7) Affidavit of Subcontractor Payment form and all copies of checks for payments listed above to the following address:

Office of Civil Rights and Small Business Development
6th Floor West 200 Mero Street
Frankfort, KY 40622

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 in this office is Mr. Melvin Bynes. Mr. Bynes' current contact information is email address – melvin.bynes2@ky.gov and the telephone number is (502) 564-3601.

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.

PROHIBITION ON TELECOMMUNICATIONS EQUIPMENT OR SERVICES

In accordance with the FY 2019 National Defense Authorization Act (NDAA), 2 CFR 200.216, and 2 CFR 200.471, Federal agencies are prohibited, after August 13, 2020, from obligating or expending financial assistance to obtain certain telecommunications and video surveillance services and equipment from specific producers. As a result of these regulations, contractors and subcontractors are prohibited, on projects with federal funding participation, from providing telecommunication or video surveillance equipment, services, or systems produced by:

- Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities)
- Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities)

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.

TRAINEES

In Compliance with the "TRAINING SPECIAL PROVISION" included in Part III of the Proposal, the Contractor will be required to employ a trainee(s) for this contract.

NATIONAL HIGHWAY

Be advised this project is on the NATIONAL HIGHWAY SYSTEM.

PROJECT TRAFFIC COORDINATOR (PTC)

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

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 AWARD OF CONTRACT

In accordance to section 103.02 of the Standard Specifications for Road and Bridge Construction, the Department may hold and not award the contract for a period not to exceed sixty (60) calendar days from the date of letting.

SPECIAL NOTE FOR EPS FOAM BLOCK EMBANKMENTS

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

REFERENCES:

All references to the Standard Specifications are to the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, Current Edition.

All references to ASTM are to the current edition.

The requirements in the Standard Specifications, NCHRP Publications, or ASTM shall be used for information not provided. Where there are conflicts between the Standard Specifications or ASTM, the Standard Specifications shall govern.

DEFINITIONS:

Manufacturer – Company that produces EPS geofoam blocks to meet the desired specifications and provides formulation and methodology for installation.

Supplier – Subcontracted by the Contractor. Provides EPS geofoam blocks to the Contractor. Responsible for design of lightweight fill as specified in this note, but may hire a subconsultant to perform the design, subject to approval by the Engineer.

1.0 DESCRIPTION.

This work consists of furnishing and installing Expanded Polystyrene (EPS) foam blocks for use as a lightweight fill material. The terms "EPS foam" and "geofoam" are considered synonymous in this Special Note.

1.1 Manufacturer Qualifications

1.1.1 The Manufacturer must have their EPS geofoam product listed in the Kentucky Product Evaluation List (KYPEL) with a status of Phase IV or Phase X and the lightweight fill and associated materials must meet all properties of Section 2 of this note. For additional information on KYPEL, contact the Department's Division of Materials, Structural Materials Branch.

1.2 Submittals

1.2.1 Details on the EPS foam block fill detail sheet shown in the contract plans are based on the stated maximum allowable unit weight. If the Contractor uses the given unit weight and configuration specified in the plans, then a material data sheet must be supplied for verification of the proposed material. Also, an installation plan for the geofoam blocks shall be submitted to the Department for review. The Contractor shall allow 30 calendar days for the review. No additional design calculations will be required unless requested by the Engineer.

If the Contractor elects to use a different unit weight or configuration, design calculations and construction plans are required clearly showing conformance with the Standard Specifications, ASTM and applicable sections of the contract plans. These calculations and plans shall be submitted to the Engineer for review 30 calendar days prior to ordering material or beginning excavation for placement of lightweight fill. Electronic submission of these documents is acceptable, unless otherwise indicated in the contract documents or requested by the Engineer. Lightweight fill designs and construction plans shall be dated, sealed, and signed by a registered professional engineer licensed to practice in Kentucky. The Contractor shall allow 30 calendar days for the Department to review the first complete submission. Additional time required by the Department to review resubmissions shall

not be cause for increasing the number of contract working days. The additional work required by the Contractor to provide resubmissions shall be at no cost to the Department.

Embankment benching, excavation stabilization, final installation and protection details necessary to construct the lightweight fill and produce a stable final embankment integrated with the remainder of the roadway embankment shall be the responsibility of the Contractor. Design of sheeting, shoring or other earth retention systems necessary to stabilize excavations shall be part of the construction submittal. The Engineer may request that construction plans for the sheeting/shoring be supplied prior to any construction.

The format for the construction plans for the EPS geofoam embankment shall be in accordance with the Division of Structural Design's Guidance Manual. The first sheet shall be a title sheet. Refer to Subsection SD-206-2 of the manual for additional requirements. Submittals shall be electronic unless otherwise noted. For additional information contact the Division of Structural Design.

1.2.2 The bid shall be based on the Supplier utilizing a Manufacturer that is listed in KYPEL as status of Phase IV or Phase X to supply EPS Geofoam Blocks.

1.2.3 Submit an installation plan for the geomembrane spill protection layer, as outlined in Section 6.4.4 of this special note. See Section 2.4 of this special note for additional requirements for the geomembrane.

1.2.4 Other documentation including material certifications, etc. shall be submitted in accordance with this special note.

1.2.5 Refer to the proposal for additional details regarding submittals.

1.3 Supplier's Representative

1.3.1 A representative of the EPS block Supplier is required to be on site during the first full day of geofoam fill construction to provide training and assistance to the Contractor's personnel and project inspectors.

1.3.2 A one-day minimum follow-up visit by the Supplier's representative will be required within two weeks of the initial visit, or as approved by the Engineer, in order to monitor progress.

1.3.3 After each on-site visit, the Contractor is required to submit a letter to the Section Engineer written by the Supplier's representative documenting the observations of each visit with documentation that the licensed professional engineer responsible for the design has reviewed the letter.

2.0 MATERIALS.

2.1 EPS Foam Blocks. Use EPS foam blocks meeting the requirements of ASTM D6817. The EPS blocks cannot contain chloro-fluorocarbon, hydro-chloro-fluorocarbon, or hydro-fluorocarbon compounds and shall be resistant to biological degradation including insect infestation.

The EPS foam block must be listed in KYPEL as Phase IX or Phase X and the block, and other materials associated with its installation, must meet all material requirements of this note. Materials from other Manufacturers of EPS blocks not listed in KYPEL may submit their product information to KYPEL for consideration at least 30 calendar days prior to beginning work.

For most applications, use EPS Blocks with standard dimensions approximately 2 to 3.5 feet tall by 4 feet wide by 8 to 16 feet long. Other proposed dimensions may be acceptable, and will be evaluated on a case-by-case basis.

The EPS block Manufacturer is responsible for maintaining a quality control program to ensure compliance with this section.

2.1.1 Block Properties

*Type	EPS 22	EPS 29	EPS 39	EPS 46
Density (ASTM C1622)	1.35 pcf	1.80 pcf	2.40 pcf	2.85 pcf
Minimum Compressive Strength @ 1% Strain (ASTM D1621)	7.3 psi	10.9 psi	15.0 psi	18.6 psi
Minimum Flexural Strength (ASTM C203)	35 psi	50 psi	60 psi	75 psi
Minimum Oxygen Index (Volume %) (ASTM D2863)	24.0%	24.0%	24.0%	24.0%

*ASTM D6817, Table 1.

2.2 Block-to-Block Connectors. When horizontal forces cannot be resisted by the friction between blocks or when seismic loads are to be resisted, take appropriate measures to permanently secure the blocks and prevent horizontal block-on-block sliding. Secure the blocks as needed during construction to prevent movement and separation. At a minimum, connect the blocks using small sections of epoxy-coated steel reinforcing bars as needed. Bars should conform to Section 602 of the current Standard Specifications. Bars should not prevent the adjacent block surfaces from being in intimate contact. Other equivalent measures may be used if approved by the Engineer.

If required based on Manufacturer recommendations or geotechnical plan notes, use gripper plates to restrain EPS blocks from moving laterally in layer over layer applications. If required, gripper plate material properties and installation shall be in accordance with Manufacturer specifications.

2.3 Leveling Pad. Use sand meeting the requirements of Section 804 under the subsections pertaining to pipe bedding. Ensure that material is free of coal, shale, roots, organic matter, frozen material, and other deleterious materials.

2.4 Spill Protection Layer. The outer surfaces of the final block configuration (except the bottom of the block volume) should be protected against chemical spill, particularly petroleum products. In order to provide this protection, a geomembrane liner will be required unless otherwise specified in the contract documents. The geomembrane should be resistant to petroleum products and manufactured of High Density Polyethylene (HDPE) or Linear Low Density Polyethylene (LLDPE). The geomembrane should also be UV resistant. Use a **textured (both sides)** geomembrane when placed on continuous slopes (not benches). The geomembrane shall meet the minimum specifications below.

Contractor may propose other comparable alternates for the spill protection layer for review by the Engineer.

2.4.1 Geomembrane Properties

Dimensional Properties:

Special order roll dimensions are preferred to minimize the amount of seams.

Thickness (ASTM D5994) 30 mil (0.75 mm)

Tensile Properties (ASTM D6693):

Tensile Strength @ Break 60 lb/in width

Minimum Elongation @ Break 300%

Puncture Resistance (ASTM D4833): 35 lbs.

Tear Resistance (ASTM D1004): 15 lbs.

2.4.2 Geotextile Properties (if required)

The geotextile shall meet requirements of Section 843 of the current Standard Specifications for Geotextile Fabric for Subsurface Drainage and Separation. Place the fabric in accordance with Section 214 of the current Standard Specifications for Slope Protection and Channel Lining.

2.5 Soil Cap. A minimum 2-foot soil cap is required over the top surface of the geomembrane. The soil shall be classified as CL or CH in the Unified Soil Classification System. The first one (1) foot of material above the geomembrane shall have a top size of 0.5 inch.

2.6 Concrete Load Distributor. A concrete load distributor will be required when geofoam is placed beneath the paved roadway and there is less than 5 feet of soil between the pavement base material and the top layer of geofoam. Where a concrete load distributor is included in the design, use Class B concrete conforming to Subsections 601.02 and 601.03, and use epoxy-coated No. 4 steel bars as reinforcement. The steel reinforcement and epoxy coating shall conform to Section 602 of the Standard Specifications.

3.0 GEOTECHNICAL DESIGN PARAMETERS.

Use the geotechnical parameters below for the design of EPS foam block configurations.

3.1 Coefficient of Friction (for internal, block-on-block calculations). An appropriate coefficient of friction should be used to check for horizontal sliding between block layers. A value of 0.6 is typical for most block types. The selected coefficient of friction will be evaluated by the Department during review of the Lightweight Fill plans (if submission of plans is required based on Section 1.2.1). The Manufacturer should provide a coefficient of friction by certification, for use in the design calculations.

3.2 Unit Weight

3.2.1 **Lightweight fill above the groundwater elevation**. Where EPS foam blocks will be above the groundwater elevation the entire design life, a density of 3.2 lb/ft^3 should be used in settlement and stability analyses to account for long-term water absorption.

3.2.2 **Lightweight fill periodically submerged.** Where EPS foam blocks will be submerged periodically due to groundwater fluctuation, a density of 4.7 lb/ft^3 should be used in settlement and stability analyses to account for long-term water absorption.

3.2.3 **Lightweight fill continually below groundwater elevation.** Where EPS foam blocks will be continually below the groundwater table, a density of 6.3 lb/ft^3 should be used in settlement and stability analyses to account for long-term water absorption due to submersion.

3.3 Design for uplift forces. Conditions where blocks will be submerged shall be accounted for by considering uplift forces in design. The uplift forces must be counteracted with overburden or suitable restraint devices with geogrids or geomembranes. The minimum density for the specified block shall be used for these calculations. A minimum factor of safety against uplift of 1.3 should be provided.

3.4 Maximum Design Stress in Blocks. The maximum design stress in the geofoam blocks should not exceed 30% of the compressive strength developed at approximately 1% strain.

3.5 Global, Seismic and Internal Stability Analyses

Global stability calculations for geofoam embankment will be the responsibility of the Department. If the Contractor elects to use a different unit weight, as discussed in Section 1.2.1, these stability calculations for the new EPS block weights will be the responsibility of the Contractor. Analyses should conform to Transportation Research Board (TRB) recommendations as outlined in NCHRP Web Document 65, Chapter 5 (global and seismic stability) and Chapter 6 (internal stability).

4.0 DELIVERY, STORAGE, AND HANDLING.

4.1 Delivery. Deliver materials in Manufacturer's original, undamaged condition with identification markings and labels intact.

4.2 Storage and Handling. Store EPS blocks so as to prevent them from being damaged. Ballast and/or secure blocks during storage and placement. Cover blocks with light-colored opaque tarps if stored outdoors for more than two weeks.

EPS blocks are combustible. Do not expose them to flame, cigarette smoking, or other ignition sources.

Do not operate any equipment directly on the EPS Blocks. If necessary, light weight rubber-tired equipment (with a contact pressure less than 15 psi may be allowed if a sufficient amount of plywood or other sheathing material is used on top of the blocks to allow the equipment to operate without damaging the blocks and if approved by the Engineer.

Do not expose the EPS Blocks to hydrocarbons, or petroleum-based solvents such as gasoline, diesel fuel, concrete curing compound, tar, and asphalt/mastic compounds.

Allow a minimum of seven days between the Manufacturer molding and the Contractor placing EPS blocks to allow adequate out-gassing of the blowing agent. A longer time period may be required by the Manufacturer.

5.0 SAMPLING AND TESTING.

5.1 Sampling. The Supplier shall obtain samples for testing by the Department, Division of Materials. Samples shall be obtained at a frequency of one set of samples per 500 cubic yards. One set of samples consists of ten (10) cubes, 2 inches on each side. Projects with less than 500 cubic yards of material will not require testing, and strength properties will be accepted based on EPS type and certification by the Manufacturer. The Supplier or Contractor may elect to obtain additional samples for independent testing.

5.2 Testing.

5.2.1 **Density.** The Department will perform 1 test per 500 cubic yards as outlined in Section 2.1 of this note. (The samples for compressive strength testing may also be used for density testing, if done before strength testing. Three (3) cube samples shall be individually measured and the average reported.)

5.2.2 **Compressive Strength.** Each individual sample obtained will be tested by the Department for compressive strength as outlined in Section 2.1 of this Special Note. Acceptance will be based on strength at 1% strain.

6.0 CONSTRUCTION. Place EPS Blocks in accordance with the Manufacturer's recommendations, in tight groups without gaps in the horizontal or vertical directions. The Contractor will be responsible for maintaining a stable slope during construction.

6.1 Surface Preparation. Smooth and level the surface and remove obstructions, debris or sharp objects that may damage the blocks. Conform to Standard Specifications Sections 202 and 207 when preparing the surface to be reinforced.

6.2 Leveling Pad. Construct a leveling pad to the lines, grades, and cross-sections as shown in the plans. Complete all leveling pad fill with a tolerance of ± 0.4 % (1/2 inch per 10 feet). The minimum thickness should be 8 inches, or as directed by the Engineer. There should be no debris or large pieces of vegetation protruding from the subgrade before placement of the leveling pad. Soil particles at the subgrade surface should be no larger than coarse sand to fine gravel (0.08 to 0.8 inch). Leveling pad materials and placement for EPS block construction will incidental to EPS Foam Block, unless otherwise stated in the plans.

6.3 EPS Block Placement. Place EPS block such that blocks in successive courses are placed at 90^{o} to the previous layer and offset so that joints between block layers are not continuous. Each horizontal joint between courses of block will be secured with a gripper plate or other connection device approved by the Engineer and the Manufacturer. The surface of the blocks must remain level within the ± 0.4% tolerance. Field cut the EPS Blocks for a tight fit at any cross-drain pipe or other similar obstruction as directed by the Engineer. Sand placement may be allowed by the Engineer between the block and obstruction if deemed necessary.

6.4 Spill Protection Layer.

6.4.1 The geomembrane should be installed according to the Manufacturer's recommendations, as shown on the EPS Geofoam Embankment Detail Sheet, and as directed by the Engineer. The chosen geomembrane configuration should prevent sliding of cover soil, protect against installation damage, and ensure adequate performance of any bends or curves in the geomembrane.

6.4.2 The Geomembrane Supplier or Installer is required to provide the layout plan for the installation of the geosynthetic material. Include a brief overview of the Installer's previous geomembrane installation experience with this submittal. This information may be submitted electronically. Allow 30 days for the Department to review this submittal.

6.4.3 The surface beneath the geomembrane shall be uniform and free of all sharp or angular objects prior to geomembrane placement. No objects larger than 0.5 inch should be protruding above the prepared subgrade. Any rebar used to connect blocks should be driven beneath the block surfaces. Gripper plates (if used) should be padded such to avoid puncturing the geomembrane with the sharp edges.

6.4.4 Seaming shall be performed in the field using a welding system and quality control testing in strict accordance with the Manufacturer's specifications. The weld seam shall provide the same physical and chemical resistance properties as the HDPE sheet.

6.4.5 The use of a geotextile above and/or beneath the geomembrane may be required to protect the geomembrane. This will be based on the Manufacturer's recommendations and will depend on the chosen configuration. The geotextile layer is required where geomembrane is placed adjacent to existing and/or proposed rock embankments.

6.4.6 Construction details for geomembrane/geofoam penetrations and adjacent structures should be provided by the Geomembrane Supplier or Installer. Construction for these situations should be conducted carefully to provide a seal that is capable of preventing leakage around the penetration or structure.

6.4.7 The geomembrane should be properly secured during construction to prevent shifting or development of wrinkles or folds. If an anchor trench is proposed for the installation, details should be provided by the Geomembrane Supplier or Installer.

6.4.8 The selected geomembrane material should be stored onsite in accordance with the Manufacturer's instructions, and should not be exposed to sunlight any longer than permitted by the Manufacturer's instructions.

6.5 Soil Cap. Two (2) feet of soil cover is required over the geomembrane. The first one (1) foot of fill placed above the geomembrane shall be a controlled fill with a top size of 0.5 inch. The material shall be placed in a single lift. This reduces the chance of puncturing the geomembrane.

6.6 Concrete Load Distributor. When a concrete load distributor is required (see Section 2.5 of this note), use a cap of reinforced, cast-in-place concrete with a minimum 4-inch thickness. Reinforce the concrete with epoxy-

coated No. 4 bars placed on two foot centers in both directions, and provide one inch of clear cover from the bottom surface of the concrete.

7.0 ACCEPTANCE. Obtain the Department's approval for all material before incorporating it into the project.

7.1 Certification. Ensure that each EPS block shipment is accompanied by a Manufacturer's certification that the material satisfies the above specifications and any applicable test data for the specified physical properties for each lot number.

8.0 MEASUREMENT.

No separate measurement shall be made for EPS Foam Block. "EPS Foam Block" fill shall be paid for based on the volume of lightweight fill shown on the plans. Changing the limits or character of the lightweight fill installation to conform to the lightweight fill Manufacturer's design and construction plans or the Contractor's selected construction methods shall not be cause for changing the plan pay quantities including plan roadway pay quantities.

If required, the Concrete Load Distributor and all associated materials will be incidental to EPS Foam Block.

The EPS Foam Block fill Manufacturer's design may require additional excavation, fill or lightweight fill volume, or incidental items to satisfy the lightweight fill design requirements. The Contractor will be responsible for maintaining a stable slope during construction. Sheeting, shoring, temporary walls or other earth retention systems necessary to stabilize any excavation required during lightweight fill construction will not be paid separately. All designs, labor, materials, etc. required to complete this work shall be incidental to EPS Foam Block.

Connection devices and sand Leveling Pad are incidental to EPS Foam Block construction and will not be paid for separately by the Department.

9.0 PAYMENT. Payment includes all equipment, labor, and materials necessary to furnish and install the EPS blocks according to the plans and specifications. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
23931EC	**EPS Foam Block**	**Cubic Foot**

1I

SPECIAL NOTE FOR CONSTRUCTED RIFFLES

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

1.0 DESCRIPTION. Furnish, install constructed riffles at the locations shown on the plans or designated by the Engineer.

2.0 MATERIALS.

2.1 Riffle Bed Material. Channel Lining Class IV for the riffle bed material shall conform to the requirements of KYTC Standard Specifications for Road and Bridge Construction (current edition) Section 805. Class IV Channel Lining shall be obtained on-site.

2.2 Boulders. Boulders shall be durable limestone or sandstone with minimum dimensions as specified in the plans on the Constructed Riffle Detail.

Limestone boulders shall demonstrate a minimum Slake Durability Index of 85 percent as determined by KM 64-513-02.

Boulders that are split, fractured or crushed during placement shall be removed and replaced.

3.0 CONSTRUCTION. Excavate the channel to the dimensions and slopes identified on the Channel Change Typical Sections and elevations shown in the Channel Change Profile View. Excavate below the stream bed to the bottom of the riffle material and Boulder Sills. Place boulders as shown in the Constructed Riffle Detail Cross Section A. Boulders shall be installed to two feet above bankfull. Actual width may vary depending on the length of the boulders. Hand place riffle fine material to fill or chink all voids. Fill or Chink the voids to the amount required to allow flow over the riffle sills and not through the riffle material. Place Channel Lining Class IV between the boulder sills at the minimum thickness, width and length shown in the Channel Change Typical Sections, Constructed Riffle Detail, Channel Change Plan View and Channel Change Profile View.

4.0 MEASUREMENT. The final quantity of Constructed Riffle will be measured in the field based on the area of the riffle in square yards. Limits of payment are based on the length of the riffle as shown in the profile view beginning at the upstream boulder sill though the downstream boulder sill multiplied by the Main Channel width shown on the Channel Change Typical Sections. The Department will not measure each boulder, chinking stone or channel lining. Excavation below the typical section and materials will be considered incidental to the unit price bid for constructed riffles.

5.0 PAYMENT. The Department will pay for Constructed Riffles at the unit price per square yard. The Department will not measure each boulder, chinking stone or channel lining. Excavation below the typical section and materials will be considered incidental to the unit price bid for constructed riffles. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to install constructed riffles. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
XXX	Constructed Riffles	Square Yards

SPECIAL NOTE FOR EXPERIMENTAL KYCT AND HAMBURG TESTING

1.0 General

1.1 Description. The KYCT (Kentucky Method for Cracking Test) and the Hamburg test results will help determine if the mixture is susceptible to cracking and rutting. During the experimental phase, data will be gathered and analyzed by the Department to determine the durability of the bituminous mixes. Additionally, the data will help the Department to create future performance based specifications which will include the KYCT and Hamburg test methods.

2.0 Equipment

2.1 KYCT Testing Equipment. The Department will require a Marshall Test Press with digital recordation capabilities. Other CT testing equipment may be used for testing with prior approval by the Department.

2.2 Water Baths. One or more water baths will be required that can maintain a temperature of 77^{o} +/- 1.8^{o} F with a digital thermometer showing the water bath temperature. Also, one water bath shall have the ability to suspend gyratory specimen fully submerged in water in accordance with AASHTO T-166, current edition.

2.3 Hamburg Wheel Track Testing. The department encourages the use of the PTI APA/Hamburg Jr. test equipment to perform the loaded wheel testing. The Department will allow different equipment for the Hamburg testing, but the testing device must be approved by the Department prior to testing.

2.4 Gyratory Molds. Gyratory molds will be required to assist in the production of gyratory specimens in accordance with AASHTO T-312, current edition.

2.5 Ovens. Adequate (minimum of two ovens) will be required to accommodate the additional molds and asphalt mixture necessary to perform the acceptance testing as outlined in Section 402 of the Kentucky Standard Specifications for Road and Bridge Construction, current edition.

2.6 Department Equipment. The Department will provide gyratory molds, PINE 850 Test Press with digital recordation, and CT testing equipment to assist during this experimental phase so data can be gathered. Hamburg test specimens will be submitted to the Division of Materials for testing on the PTI APA/Hamburg Jr if the asphalt contractor or district materials office does not have an approved Hamburg testing device.

3.0 Testing Requirements

3.1 Acceptance Testing. Perform all acceptance testing and aggregate gradation as according with Section 402 and Section 403 of the Kentucky Standard Specifications for Road and Bridge Construction, current edition.

3.2 KYCT Testing. Perform crack resistance analysis (KYCT) in accordance with the current Kentucky Method for KYCT Index Testing during the mix design phase and during the plant production of all surface mixtures. For mix design approvals, submit KYCT results on the Department MixPack. For Class 4 mixtures, submit ingredient materials to the Division of Materials for informational verification.

3.2.1 KYCT Frequency. Obtain an adequate sample of hot mix asphalt to insure the acceptance testing, gradation, and KYCT gyratory samples can be fabricated and is representative of the bituminous mixture. Acceptance specimens shall be fabricated first, then immediately after, fabricate the KYCT samples with the gyratory compactor in accordance with Section 2.4 of this Special Note. Analysis of the KYCT specimens and gradation will be required one per sublot produced from the same asphalt material and at the same time as the acceptance specimen is sampled and tested.

3.2.2 Number of Specimens and Conditioning. Fabricate specimens in accordance with the Kentucky Method for KYCT Index Testing. Contrary to the method, fabricate a minimum of 3 and up to 6 test specimens. The specimens shall be compacted at the temperature in accordance to KM 64-411. KYCT mix design specimens shall be short-term aged conditioned for four hours at compaction temperature in accordance to KM 64-411. Plant produced bituminous material will not be required for age conditioning and shall be fabricated immediately after the gyratory acceptance specimens have been fabricated. An acceptable transport container will be required to prevent the asphalt mixture from losing heat and to maintain the compaction temperature of the asphalt mixture until the KYCT gyratory samples can be fabricated. This will eliminate reheating of the asphalt mixture. To insure confidence and reliability of the test results provided by KYCT testing and Hamburg testing, reheating of the asphalt mixture is strongly discouraged. If reheating does occur, provide documentation on the Asphalt Mixtures Acceptance Workbook (AMAW).

3.2.3 Record Times. For each sublot, record the time required between drying aggregates in the plant to KYCT specimen fabrication. The production time may vary due to the time that the bituminous material is held in the silo. Record the preconditioning time when the time exceeds the one hour specimen cool down time as required in accordance to The Kentucky Method for KYCT Index Testing. The preconditioning time may exceed an hour if the technician is unable to complete the test on the same day or within the specified times as outlined in The Kentucky Method for KYCT Index Testing. The production time and the preconditioning time shall be recorded on the AMAW.

3.2.4 File Name. As according to section 7.12 of The Kentucky Method for KYCT Index Testing, save the filename with the following format; “CID_Approved Mix Number_Lot Number_Sublot Number_ Date”

3.3 Hamburg Testing. Perform the rut resistance analysis (Hamburg) in accordance to AASTHO T-324, not to exceed 20,000 passes for all bituminous mixtures during the mix design phase and production. For mix design approvals, submit Hamburg results on the Department MixPack. For Class 4 mixtures, submit ingredient materials to the Division of Materials for informational verification.

3.3.1 Hamburg Testing Frequency. Perform testing and analysis per lot of material. The plant produced bituminous material sampled for the Hamburg test does not have to be obtained at the same time as the acceptance and KYCT sample. If the Hamburg test sample is not obtained at the same time as the KYCT sample, determine the Maximum Specific Gravity of the KYCT sample in accordance with AASHTO T-209 coinciding with the Hamburg specimens.

3.3.2 Record Times. Record the production time as according to section 3.2.3 in this special note. Also record the time that the specimens were fabricated and the time the Hamburg testing was started. All times shall be recorded on the AMAW.

3.3.3 File Name. Save the Excel spreadsheet with the following file name; "Hamburg_CID_Approved Mix Number_Lot Number_Sublot Number_Date" and upload the file into the AMAW.

4.0 Data

Submit the AMAW and all test data that was obtained for acceptance, gradation, KYCT, and Hamburg testing within five working days once all testing has been completed for a lot to Central Materials Lab and the District Materials Engineer. Also, any data and or comments that the asphalt contractor or district personnel deem informational during this experimental phase, shall also be submitted to the Central Materials Lab and the District Materials Engineer. Any questions or comments regarding any item in this Special Note can be directed to the Central Office, Division of Materials, Asphalt Branch.

5.0 KYCT Video Demonstration

https://youtu.be/84j0bM45-hg

6.0 Payment

Any additional labor and testing equipment that is required to fabricate and test the KYCT and Hamburg specimens shall be considered to be incidental to the asphalt surface line item. The Department will perform the testing for the KYCT and Hamburg specimens if a producer does not possess the proper equipment.

June 3, 2019

SPECIAL NOTE FOR
GROOVED ALL WEATHER PAVEMENT MARKINGS

1. DESCRIPTION. Furnish and install a wet retroreflective pavement marking system in accordance with this special note. Project will include use of thermoplastic striping. Striping (both edge and skip lines) shall include specified elements to provide wet retroreflectivity. Lines shall be installed in a shallow groove to protect retroreflective elements.

2. THERMOPLASTIC STRIPING. Thermoplastic pavement markings shall comply with Sections 714 and 837 of the Department of Highways' Standard Specifications for Road and Bridge Construction, unless otherwise noted. Contrary to Section 714 of the Standard Specifications, thermoplastic striping shall be a minimum thickness of 100 mils. Striping shall include specified elements to provide wet retroreflectivity.

Gaps in the edge lines, as outlined in the Subsection 714.03.01 of the Standard Specifications for Road and Bridge Construction, will not be necessary since striping will be recessed below the surface.

3. WET REFLECTIVE ELEMENTS. Wet reflective beads shall be one of the following products:

- 3M Connected Roads All Weather Elements
- Potters Visimax Highway Glass Bead System

The color of the wet reflective beads shall match the color of the line being applied. Traditional and wet reflective beads shall be applied in a double-drop application of traditional glass beads and wet reflective optical elements. Contractor shall follow manufacturer’s recommendations as to incorporating wet reflective elements into the striping operation. Apply traditional beads and wet reflective elements in sufficient quantities to obtain the dry retroreflectivity requirements and desired wet retroreflectivity levels. A 50/50 ratio of traditional beads to wet reflective elements is recommended, but bead distribution may be modified with the approval of the engineer, if the contractor feels that a different distribution is necessary to meet dry/wet retroreflectivity levels.

The manufacturer of the wet reflective bead shall have a factory representative on site before the contractor begins striping operations. The factory representative shall assure the engineer that the wet reflective system has been calibrated for proper application before the contractor begins. The factory representative shall remain available to periodically assure the engineer the system is being applied according to the manufacturer’s recommendations. A random sample of wet reflective elements shall be provided to the Division of Materials before use on the project.

4. PLACEMENT IN GROOVE. In an attempt to protect the retroreflective elements, striping shall be installed in shallow grooves. Contractor shall follow bead manufacturer’s recommendations regarding grooving applications.

Grooves shall be a minimum of 2” from any longitudinal pavement joint. The groove shall not be

installed on concrete surfaces or in other areas identified by the Engineer. The groove shall not be installed continuously for intermittent pavement markings, but only where markings are to be applied.

Grooves shall be 1 inch ± ¼ inch wider than the pavement marking material. Groove depth shall be 150 mils ±5 mils, unless otherwise approved by the Engineer. Depth shall be consistent across the full width of the groove. Depth plates shall be provided by the Contractor to the Engineer to assure that desired groove depth is achieved.

Grooves that are ground deeper or wider than the specified allowable limits shall be repaired per the direction of the Engineer at no additional cost. Grooves that are ground too shallow, too narrow, or with unacceptable rises between blade cuts shall be reground to the correct size, depth, and surface finish at no additional cost. Slots ground out of alignment shall be patched using an approved method and materials.

Prior to cutting out the grooves for all recessed lines, the Contractor shall use a chalk line or other suitable method to layout the proposed pavement markings on the surface course so that the Engineer can inspect the locations.

Grooves shall be clean, dry and free of laitance, oil, dirt, grease, paint or other foreign contaminants. If water is used to clean the groove or the grooving process takes place during rainfall, a minimum of 24 hours of dry time is required prior to the placement of pavement markings.

After the depth, width, length, and surface condition has been approved by the Engineer, grooves shall be cleaned of any fine particles using high-pressure compressed air before application of the striping. The Contractor shall prevent traffic from traversing the grooves and re-clean grooves, as necessary, prior to application of pavement markings at no additional cost to the Department.

5. PAVEMENT MARKING PERFORMANCE. Pavement marking retroreflectivity performance under dry conditions will be evaluated in accordance with the Standard Specifications for Road and Bridge Construction.

The use of wet reflective elements on this project is part of a pilot effort to evaluate potential pavement marking enhancements. As a result, minimum wet retroreflectivity values have been established and will be measured. However, the wet retroreflectivity performance will not be considered as part of the acceptance and payment for pavement striping on this project.

Desired minimum wet recovery retroreflectivity requirements at the end of the proving period (Standard Specifications for Road and Bridge Construction, Section 714.03.06) are as follows:

Retroreflectivity ($mcd(ft^{-2})(fc^{-1})$) {metric equivalent $mcd(m^{-2})(lux^{-1})$}

	White	Yellow
Wet recovery (ASTM 2177)	250	175
Wet Continuous (ASTM E2832)	150	100

In support of wet retroreflectivity testing, samples of representative markings (both white and yellow) shall be provided on one foot sections of rigid panel (20 gauge aluminum or thicker). Samples shall be taken at the beginning and end of the striping operation (total of two samples per color). Samples shall be protected from damage and submitted to the Division of Materials for testing and record of the project output for the materials used. Lines on the project are subject to future testing to monitor pavement marking performance in the field.

6. MEASUREMENT. Wet retroreflective elements will be incidental to the pay items for pavement striping.

The Department will measure work required for the installation of the recessed groove. The Department will not measure surface preparation and pre-marking of the groove for payment and will consider them incidental to the groove pay item. Corrective work will not be measured for payment.

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

Code	Pay Item	Pay Unit
25019EC	Groove for Pave Striping – 7 IN	LF
25008EC	Pave Striping-Thermo-6 IN W-Wet Reflect	LF
25009EC	Pave Striping-Thermo-6 IN Y- Wet Reflect	LF

March 27, 2019

SPECIAL NOTE FOR HMA ELECTRONIC DELIVERY MANAGEMENT SYSTEM (HMA e-Ticketing)

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. Incorporate a GPS Fleet Management System for all HMA delivered to the project in order to monitor, track, and report loads of HMA during the construction processes from the point of measurement and loading to the point of incorporation to the project.

2.0 MATERIALS AND EQUIPMENT. Submit to the Engineer for approval, no fewer than 30 days prior to HMA placement activities, a GPS fleet management system supplier that can provide a qualified representative for on-site technical assistance during the initial setup, pre-construction verifications, and data management and processing as needed during the Project to maintain equipment.

Provide operator settings, user manuals, training videos, and required viewing/export software for review. Provide equipment that will meet the following:

1. A wireless fleet management or GPS device that is capable of tracking all delivery trucks (both company-owned and third-party) must be installed on all trucks and equipment (dump trucks, belly dumps, side-load dumps, transfer vehicles, pavers, or any other trucks/vehicles) used to transfer and incorporate HMA into the project. KYTC personnel shall have the ability to access Real Time monitoring through the use of a mobile device such as an iPad, smartphone, etc.

2. The fleet management system shall be fully integrated with the Contractor's Load Read-Out scale system at the HMA plant site.

3. The fleet management system shall have the ability to measure and track vehicles and their contents (weights and material types) continuously from the plant site to the project site. The system shall have internal battery backup capabilities due to loss of power, and have the ability to store data if GPS connectivity is lost and transmit that same data when unit re-establishes connectivity. To be considered continuous, no two data points shall be more than 60 seconds apart unless the vehicle is stopped. Duration of stop time for any reason shall be recorded.

3.0 CONSTRUCTION. Provide the Engineer with the manufacturer's specifications and all required documentation for data access at the pre-construction conference.

A. Construction Requirements

1. Install and operate equipment in accordance with the manufacturer's specifications.

2. Verify the GPS is working within the requirements of this Special Note.

B. Data Deliverables

Provide to the Engineer a means in which to gather report summaries by way of iOS apps, web pages, or any other method at the disposal of the Engineer. The Engineer may request data at any time during paving operations.

1. Real-time Continuous Data Items

Provide the Engineer access to a GIS map-based data viewer which displays the following information in real-time with a web-based system compatible with iOS and Windows environments.

- Each Truck
  - UniqueTruck ID
  - Truck status
    - Time At Source
    - Time At Destination
    - Time At Paver
    - Time At Scale
    - Time to and from plant/job
    - Time Stopped with Engine Running
  - Time of last transmission
  - Location (Latitude and Longitude in decimal degrees to nearest 0.0000001) every 60 seconds
  - Description of Material being transported (i.e. asphalt base, asphalt surface)
  - Mix Design Number
  - Net Weight of material being transported to the nearest 0.01 ton
  - Running Daily Total of Net Weight of material being transported to nearest 0.01 ton.
  - Project Number

- Scale Location
- Project Location
- Point of Delivery (i.e. paver)

2. Daily Summary

The following summary information shall be provided to the Engineer electronically within 4 hours of beginning operations on the next working day

- For each Material
  - List of Individual Loads
    - Contractor Name
    - Project Number
    - Unique Truck ID
    - Net Weight For Payment (nearest 0.01 tons)
    - Date
    - Mix Temperature at Time of Loading, Fahrenheit (to be key entered by plant)
    - Time Loaded
    - Time Unloaded
    - Delivery Location (Latitude/Longitude in decimal degrees to nearest 0.0000001)
- For each Bid Item
    - Total Quantity for Payment (nearest 0.01 tons)

4.0 MEASUREMENT. The Department will measure the HMA electronic delivery management system as a lump sum item.

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.
3. Payment will be full compensation for costs related to providing the GPS system, including all equipped pavers and transfer vehicles, integration with plant load-out systems, and any software required for the construction and reporting process. All quality control procedures including the GPS systems representative's technical support and on-site training shall be included in the Contract lump sum price.

Code	Pay Item	Pay Unit
24986EC	HMA ELECTRONIC DELIVERY MANAGEMENT SYSTEM	LS

SPECIAL NOTE FOR INLAID PAVEMENT MARKERS

I. DESCRIPTION

Except as provided herein, perform all work in accordance with the Department's Standard and Supplemental Specifications and applicable Standard and Sepia Drawings, current editions. Article references are to the Standard Specifications. This work shall consist of:

(1) Maintain and Control Traffic; and (2) furnish and install Inlaid Pavement Markers (IPMs) in recessed grooves; and (3) any other work as specified by these notes and the Contract.

II. MATERIALS

The Department will sample all materials in accordance with the Department's Sampling Manual. Make the materials available for sampling a sufficient time in advance of the use of the materials to allow for the necessary time for testing unless otherwise specified in these Notes.

A. Maintain and Control Traffic. See Traffic Control Plan.

B. Markers. Provide reflective lenses with depth control breakaway positioning tabs. Before furnishing the markers, provide to the Engineer the manufacturer's current recommendations for adhesives and installation procedures. Use one brand and design throughout the project. Use markers meeting the specifications in the table below.

SPECIFICATIONS FOR HOUSING AND REFLECTOR	
Material:	Polycarbonate Plastic
Weight:	Housing 2.00 oz.
	Reflector 2.00oz.
Housing Size:	5.00" x 3.00" x 0.70" high
Specific Intensity of Reflectivity at 0.2° Observation Angle	
White:	3.0 at 0°entrance angle
	1.2 at 20°entrance angle
Yellow:	60% of white values
Red:	25% of white values

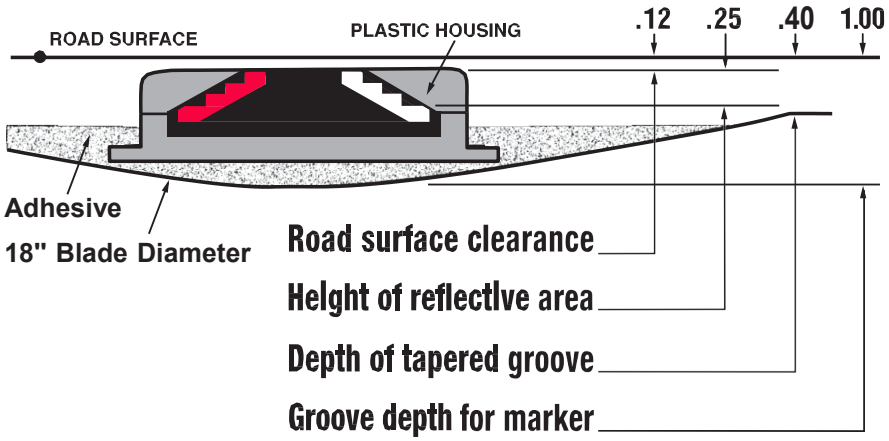
C. Adhesives. Use adhesives that conform to the manufacturer's recommendations.

III. CONSTRUCTION

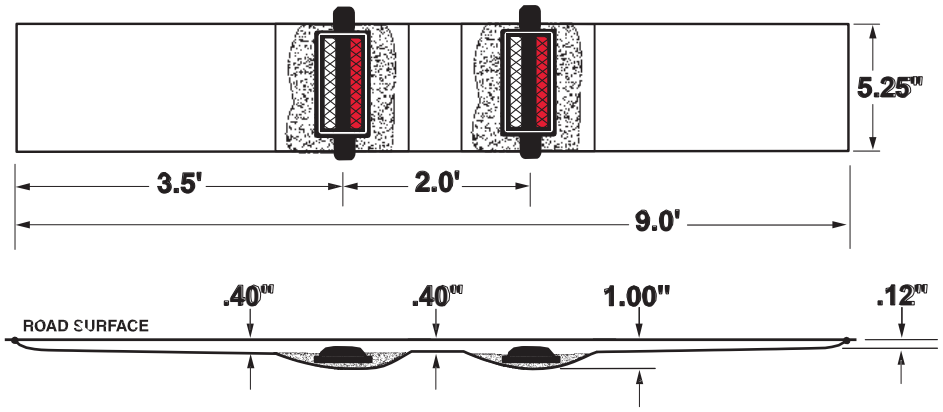
A. Maintain and Control Traffic. See Traffic Control Plan.

B. Installation. Install IPMs in recessed grooves cut into the final course of pavement according to the manufacturer's recommendations. Do not cut the grooves until the pavement has cured sufficiently to prevent damaging the pavement. Cut installation grooves using diamond blades on saws that accurately control groove dimensions. Remove all dirt, grease, oil, loose or unsound layers, and any other material from the marker area which would reduce the bond of the adhesive. Maintain pavement surfaces in a clean condition until placing markers.

Prepare the pavement surfaces, and install the markers in the recessed groove according to the drawing below. Use an approved snowplowable epoxy adhesive. Ensure that the adhesive bed area is equal to the bottom area of the marker, and apply adhesive in sufficient quantity to force excess out around the entire perimeter of the marker. Use materials, equipment, and construction procedures that ensure proper adhesion of the markers to the pavement surface according to the manufacturer's recommendations. Remove all excess adhesive from in front of the reflective faces. If any adhesive or foreign matter cannot be removed from the reflective faces, or if any marker fails to properly adhere to the pavement surface, remove and replace the marker at no additional cost to the Department.



C. Location and Spacing. Install the markers in the pattern for high reflectivity with two (2) IPMs per groove. Locate and space markers as shown in the current standard drawings or sepias (note: use Inlaid Pavement Markers wherever Type V Pavement Markers are called for). Do not install markers on bridge decks. Do not install a marker on top of a pavement joint or crack. Offset the recessed groove a minimum of **3** inches from any longitudinal pavement joint or crack and at least one inch from the painted stripe, ensuring that the finished line of markers is straight with minimal lateral deviation. Give preference to maintaining the **3**-inch offset between recessed groove and joint as opposed to keeping the line of markers straight.



Place inlaid markers as much in line with existing pavement striping as possible. Place markers installed along an edge line or channelizing line so that the near edge of the plastic housing is no more than one inch from the near edge of the line. Place markers installed along a lane line between and in line with the dashes. Do not place markers over the lines except where the lines deviate visibly from their correct alignment, and then only after obtaining the Engineer's prior approval of the location.

If conflicts between recessed groove placement in relation to pavement joint and striping cannot be resolved, obtain the Engineer's approval to eliminate the marker or revise the alignment.

D. Disposal of Waste. Dispose of all removed pavement, debris, and other waste at sites off the right of way obtained by the Contractor at no additional cost to the Department. See Special Note for waste and Borrow.

E. Restoration. Be responsible for all damage to public and/or private property resulting from the work. Restore all damaged features in like kind materials and design at no additional cost to the Department.

F. On-Site Inspection. Make a thorough inspection of the site prior to submitting a bid and be thoroughly familiar with existing conditions so that the work can be expeditiously performed after a contract is awarded. The Department will consider submission of a bid as evidence of this inspection having been made and will not honor any claims for money or grant Contract time extensions resulting from site conditions.

G. Caution. Do not take information shown on the drawings and in this proposal and the types and quantities of work listed as an accurate or complete evaluation of the material and conditions to be encountered during construction, but consider the types and quantities of work listed as approximate only. The bidder must draw his own conclusion as to the conditions encountered. The Department does not give any guarantee as to the accuracy of the data and no claim will be considered for additional compensation or extension of Contract time if the conditions encountered are not in accordance with the information shown.

IV. MEASUREMENT

A. Maintain and Control Traffic. See Traffic Control Plan.

B. "INLAID PAYMENT MARKER" shall be measured as each. One (1) installation of "INLAID PAVEMENT MARKER" will consist of grooving the pavement, removing cuttings and debris, preheating pavement to remove moisture, adhesives, and installation of two (2) markers with all lenses in accordance with this note.

Note: Each pay item of Inlaid Pavement Marker will require two markers.

V. PAYMENT

A. Maintain and Control Traffic. See Traffic Control Plan.

B. Inlaid Pavement Markers. The Department will make payment for the completed and accepted quantity of completely installed "INLAID PAVEMENT MARKERS" at the Contract unit price, each. Accept payment as full compensation for all labor, equipment, materials, and incidentals to accomplish this work to the satisfaction of the Engineer. A system of one (1) groove and two (2) markers shall be paid as one "INLAID PAVEMENT MARKER". The bid item "INLAID PAVEMENT MARKER" shall be used regardless of the color and type of lenses required.

SPECIAL NOTE FOR LANE SEPARATOR CURB

I. DESCRIPTION

Except as provided herein, perform all work in accordance with the Department's Standard Specifications, Interim Supplemental Specifications, Standard and Sepia Drawings, and Special Notes and Special Provisions, current editions. Article references are to the Standard Specifications. The project shall consist of furnishing all labor, equipment, materials, and incidentals for the following:

(1) Installing lane separator curb; and (2) All other work specified in the Contract.

II. MATERIALS

All materials shall be sampled and tested in accordance with the Department's Sampling Manual and the materials shall be available for sampling a sufficient time in advance of the use of the materials to allow for the necessary time for testing unless otherwise specified in these Notes.

A. Lane Separator Curb. Furnish lane separator curb guidance system that includes modular longitudinal curb sections and transition end sections, and delineator posts/panels. The longitudinal units of the system shall interface with each other to form a continuous longitudinal channelizing system. The design of the system shall allow a radius or curve as needed by roadway geometry. The complete system shall be compliant with NCHRP 350 or MASH. Manufacturer's documentation validating this compliance shall be provided to the Engineer prior to installation. System color shall match the adjacent pavement marking color.

a. Longitudinal Units. The longitudinal units shall have a mountable design to allow for emergency vehicle crossovers. The longitudinal units shall be designed to allow for cross drainage under the units. Individual units of the system shall have a minimum length of 40 inches, maximum height of 4 inches and maximum width of 12 inches. The longitudinal base shall include retroreflective markings to match the system color. At least one upright post is required for each longitudinal curb unit.

b. Upright Posts. Upright posts shall be a minimum of 26 inches in height and a minimum of 2 inches in width. Upright posts are to be uniformly spaced at intervals no greater than 44 inches along the system. Post color should match the longitudinal curb unit and adjacent pavement marking color. Each post shall have retroreflective markings of color matching the post, longitudinal system, and adjacent pavement marking. Upright posts should be easily replaceable under traffic conditions and shall be fabricated to withstand repeated impacts and return to a complete upright position with minimal maintenance to the unit.

III. CONSTRUCTION METHODS

A. Site Preparation. Be responsible for all site preparation including, but not limited to: clearing and grubbing, staking, excavation, backfill, and removal of obstructions or any other material not covered by other items. Perform site preparation only as approved, or directed, by the Engineer.

B. Lane Separator Curb. Assemble and fasten the lane separator curb system to the underlying pavement or bridge deck according to the manufacturer's recommendations.

C. Property Damage. The Contractor shall be responsible for all damage to public and/or private property resulting from the Contractor's activities. Repair or replace damaged roadway features in like kind materials and design as directed by the Engineer at no additional cost to the Department. Repair or replace damaged private property in like kind materials and design to the satisfaction of the owner and the Engineer at no additional cost to the Department.

D. Caution. The information in this proposal and the type of work listed herein are approximate only and are not to be taken as an exact evaluation of the materials and conditions to be encountered during construction; the

bidder must draw his/her own conclusions when developing the Unit Bid Prices for each bid item. As such, if the conditions encountered are not in accordance with the information shown, the Department does not guarantee any changes to the Unit Bid Price nor extension of the contract will be considered. The Department will pay for bid item quantity overruns, but only if pre-approved by the Engineer.

IV. METHOD OF MEASUREMENT

A. Site Preparation. Other than the bid items listed, the Department will NOT measure Site Preparation for payment, but shall be incidental to the project bid items.

B. Lane Separator Curb. The Department will measure Lane Separator Curb in Linear Feet.

V. BASIS OF PAYMENT

A. Lane Separator Curb. The Department will make payment for the completed and accepted quantities under the bid item "Lane Separator Curb." Payment at the Contract unit price per linear foot shall be full compensation for furnishing all materials, equipment, tools, hardware, labor, and incidentals necessary to properly install the lane separator curb according to the manufacturer's installation instructions, these notes, and/or as directed by the Engineer.

Code	Pay Item	Pay Unit
24768EC	Lane Separator Curb	LF

SPECIAL NOTE FOR NON-TRACKING TACK COAT

1. DESCRIPTION AND USEAGE. This specification covers the requirements and practices for applying a non-tracking tack asphalt coating. Place this material on the existing pavement course, prior to placement of a new asphalt pavement layer. Use when expedited paving is necessary or when asphalt tracking would negatively impact the surrounding area. This material is not suitable for other uses. Ensure material can "break" within 15 minutes under conditions listed in 3.2.

2. MATERIALS, EQUIPMENT, AND PERSONNEL.

2.1 Non-Tracking Tack. Provide material conforming to Subsection 2.1.1.

2.1.1 Provide a tack conforming to the following material requirements:

Property	Specification	Test Procedure
Viscosity, SFS, 77 ˚ F	20 – 100	AASHTO T 72
Sieve, %	0.3 max.	AASHTO T 59
Asphalt Residue[1], %	50 min.	AASHTO T 59
Oil Distillate, %	1.0 max.	AASHTO T 59
Residue Penetration, 77 ˚ F	20 max.	AASHTO T 49
Original Dynamic Shear (G*/sin δ), 82 ˚ C	1.0 min.	AASHTO T 315
Softening Point, ˚ F	149 min.	AASHTO T 53
Solubility, %	97.5 min.	AASHTO T 44

[1] Bring sample to 212 ˚F over a 10-15 minute period. Maintain 212 ˚F for 15-20 minutes or until 30-40 mL of water has distilled. Continue distillation as specified in T59.

2.2. Equipment. Provide a distributor truck capable of heating, circulating, and spraying the tack between 170 ˚F and 180 ˚F. Do not exceed 180 ˚F. Circulate the material while heating. Provide the correct nozzles that is recommend by the producer to ensure proper coverage of tack is obtained. Ensure the bar can be raised to between 14" and 18" from the roadway.

2.3. Personnel. Ensure the tack supplier has provided training to the contractor on the installation procedures for this product. Make a technical representative from the supplier available at the request of the Engineer.

3. CONSTRUCTION.

3.1 Surface Preparation. Prior to the application of the non-tracking tack, ensure the pavement surface is thoroughly dry and free from dust or any other debris that would inhibit adhesion. Clean the surface by scraping, sweeping, and the use of compressed air. Ensure this preparation process occurs shortly before application to prevent the return of debris pavement. If rain is expected within one hour after application, do not apply material. Apply material only when the surface is dry, and no precipitation is expected.

3.2 Non-tracking Tack Application. Ensure the roadway temperature is a minimum of 40 ˚F and rising during the application of the tack. This material is not suitable for use in colder temperatures. Prior to applying the tack, demonstrate competence in applying the tack according to this note to the satisfaction of the Engineer. Heat the tack in the distributor to between 170 – 180 ˚F. After initial heating to between 170 – 180 ˚F, the material may be sprayed between 165 ˚F and 180 ˚F. Do not apply outside this temperature range. Apply material at a minimum rate of 0.70 pounds (0.08 gallons) per square yard. Ensure full coverage of the material on the pavement surface. Full coverage of this material is critical. If full coverage is not achieved, material application rate may be increased to ensure full coverage. Do not heat material more than twice in one day.

3.3 Non-tracking Tack Certification. Furnish the tacks certification to the Engineer stating the material conforms to all requirements herein prior to use.

3.4 Sampling and Testing. The Department will require a sample of non-tracking tack be taken from the distributor at a rate of one sample per 15,000 tons of mix. Take two 1 gallon samples of the heated material and forward the sample to the Division of Materials for testing within 7 days. Ensure the product temperature is between 170 and 180 °F at the time of sampling.

4. MEASUREMENT. The Department will measure the quantity of non-tracking tack in tons. The Department will not measure for payment any extra materials, labor, methods, equipment, or construction techniques used to satisfy the requirements of this note. The Department will not measure for payment any trial applications of non-tracking tack, the cleaning of the pavement surface, or furnishing and placing the adhesive. The Department will consider all such items incidental to the non-tracking tack.

5. PAYMENT. The Department will pay for the non-tracking tack at the Contract unit bid price and apply an adjustment for each manufacturer’s lot of material based on the degree of compliance as defined in the following schedule. When a sample fails on two or more tests, the Department may add the deductions, but the total deduction will not exceed 100 percent.

Non-Tracking Tack Price Adjustment Schedule						
Test	Specification	100% Pay	90% Pay	80% Pay	50% Pay	0% Pay
Viscosity, SFS, 77 ˚ F	20 – 100	19 - 102	17 - 18 103 - 105	15 - 16 106 - 107	14 108 - 109	≤13 ≥ 110
Sieve, %	0.30 max.	≤ 0.40	0.41 - 0.50	0.51 - 0.60	0.61 - 0.70	≥ 0.71
Asphalt Residue, %	50 min.	≥49.0	48.5 – 48.9	48.0 – 48.4	47.5-47.9	≤ 47.4
Oil Distillate, %	1.0 max.	≤1.0	1.1-1.5	1.6 - 1.7	1.8-1.9	>2.0
Residue Penetration, 77 ° F	20 max.	≤ 21	22 - 23	24 - 25	26 - 27	≥ 28
Original Dynamic Shear (G*/sin δ), 82 ˚ C	1.0 min.	≥0.95	0.92 – 0.94	0.90 – 0.91	0.85 - 0.89	≤ 0.84
Softening Point, º F	149 min.	≥145	142 - 144	140 - 141	138 - 139	≤ 137
Solubility, %	97.5 min.	≥ 97.0	96.8 – 96.9	96.6 – 96.7	96.4 – 96.5	≤ 96.3

Code	Pay Item	Pay Unit
24970EC	Asphalt Material for Tack Non-Tracking	Ton

January 28, 2020

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 ± 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 ± 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. And 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.

Code	Pay Item	Pay Unit
24891EC	PAVE MOUNT INFRARED TEMP EQUIPMENT	SQFT

SPECIAL NOTE FOR PIPE LINER ACCEPTANCE TESTING

PART 1 -- GENERAL

1.01 SCOPE OF WORK

A. Furnish all necessary labor, materials, equipment, services and incidentals required to visually inspect by means of closed-circuit television (CCTV) designated pipe sections including, but not limited to, recording and playback equipment, materials and supplies.

B. The inspection shall be performed on one section (i.e. curb box inlet to curb box inlet) at a time. The section being inspected shall be suitably isolated from the remainder of the system.

C. Video recordings shall be made of the television inspections and copies of both the recordings and printed inspection logs shall be supplied to the Engineer.

D. Contractor may have to perform point repairs, remove obstructions or remove protruding service connections to complete pre-rehabilitation TV inspection.

PART 2 -- PRODUCTS

2.01 EQUIPMENT

A. The television camera used for inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operative in 100 percent humidity conditions. The camera, television monitor and other components of the video system shall be capable of producing a minimum 500-line resolution color video picture. Picture quality and definition shall be to the satisfaction of the Engineer and if unsatisfactory, inspection shall be performed again with the appropriate changes made as designated by the Engineer at no additional cost to the Engineer. The television inspection equipment shall have an accurate footage counter that shall display on the monitor, the exact distance of the camera from the centerline of the starting manhole.

PART 3 -- EXECUTION

3.01 PROCEDURE

A. The camera shall be moved through the pipe in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the pipe's condition but in no case will the television camera be pulled at a speed greater than 30 fpm. Manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the pipe conditions shall be used to move the camera through the line. If, during the inspection operation, the television camera will not pass through the entire section, the equipment shall be removed and repositioned in a manner so that the inspection can be performed from the opposite opening. All set-up costs for the inspection shall be included in the unit prices bid. If the camera fails to pass through the entire section, the Contractor shall perform point repairs as required or approved by the Engineer. Point repairs will be paid as each at the bid price for "PIPE REPAIR". The Contractor shall re-clean or further remove blockage after the point repairs at no additional cost to the Engineer.

B. Whenever non-remote powered and controlled winches are used to pull the television camera

through the line, telephones, radios, or other suitable means of communication shall be set up between the two openings of the line being inspected to ensure that good communications exist between members of the crew.

The camera height shall be adjusted such that the camera lens is always centered in the pipe being televised. Flow shall be controlled such that depth of flow shall not exceed 20% of pipe's diameter.

Lighting system shall be adequate for quality pictures.

3.02 RECORDING OF FIELD OBSERVATIONS

A. Television Inspection logs

1. Printed location records shall be kept which shall clearly show the location. In addition, other data of significance including joints, unusual conditions, roots, collapsed sections, or presence of scale and corrosion that the camera failed to pass through and reasons for the failure and other discernible features shall be recorded and annotated using the PACP system and a copy of such records shall be supplied to the Engineer.

B. Digital Recordings

1. The purpose of digital recording shall be to supply a visual and audio record of areas of interests of the pipe segments that may be replayed by the Engineer. Digital recording playback shall be at the same speed that it was recorded and shall be made in color. The Contractor shall be required to have all digital media and necessary playback equipment readily accessible for review by the Engineer during the project.

2. The Contractor shall perform CCTV inspection of each newly installed or rehabilitated pipe segment after testing and before re-introducing any flow into the pipe. Each test shall be witnessed by the Engineer.

3. The Contractor shall record each CCTV inspection on a DVD and submit such recordings to the Engineer as a prerequisite for Partial Utilization/Substantial Completion.

4. CCTV inspections shall be performed by a PACP certified and trained person.

5. Inspections shall include narration that notes the location and type of defects, if any.

6. At the completion of the project, the Contractor shall furnish all of the original digital recordings to the Engineer. Each disc shall be labeled as to its contents. Labels shall include the disc number, date televised, sewer segment reach designation, street location, and structure numbers on the disc. The Contractor shall keep a copy of the discs for 30 days after the final payment for the project, at which time the discs may be erased at the Contractor's option.

PART 4 – PAYMENT

Payment for both the video inspection prior to and after the Pipe Liners have been installed will be made as one lump sum payment as PIPE LINER ACCEPTANCE TESTING. Payment for PIPE LINER ACCEPTANCE TESTING will be considered full compensation for all work, equipment, and incidentals necessary to perform the video inspection in accordance with this note.

Payment for pipe point repairs will be made as each at the bid price for PIPE REPAIR. Payment for PIPE REPAIR will be considered full compensation for all work, equipment, and incidentals necessary to make point repairs as required and approved by the Engineer.

June 1, 2017

SPECIAL NOTE FOR PVC FOLD-AND-FORM PIPE LINER

I. GENERAL

A. SUMMARY

1. Section Includes: Definition of the approved methods and materials to rehabilitate gravity pipelines by the insertion of a continuously extruded, folded, PVC Fold-and-Form Pipe Liner into a conduit (host pipe), and the "blow-molding" (thermoforming) of the pipe liner to conform to the shape of the existing pipe. The pipe liner shall:

   a) Extend continuously from one access point to the next access point with no joints.

   b) Provide a tightly conforming fit against the inner wall of the host pipe.

   c) Definitions:

      (1) PVC Fold-and-Form Pipe Liner: A continuously extruded (joint-less), polyvinyl chloride (PVC) Pipe Liner that is shaped into a reduced form to facilitate insertion into existing pipelines or conduits. The Pipe Liner shall return to its extruded, round memory upon application of heat and pressure and form tightly against the host pipe by "blow molding" (thermoforming) techniques.

      (2) Host Pipe: An existing gravity pipeline or conduit to be internally rehabilitated by installation of the PVC Fold-and-Form Pipe Liner.

B. REFERENCES

1. Codes and standards referred to in this Special Note are:

   a) ASTM D 256: Standard Test Methods for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.

   b) ASTM D 638: Standard Test Method for Tensile Properties of Plastics

   c) ASTM D 790: Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics

   d) ASTM D 1784: Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds

   e) ASTM D 2122: Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

   f) ASTM D 2152: Standard Test Method for Extrusion Quality using Acetone Immersion

   g) ASTM D 2444: Standard Test Method for Impact Strength

   h) ASTM F 1057: Standard Test Method for Extrusion Quality using Heat Reversion

   i) ASTM F 1504: Standard Specification for Folded/Formed Poly (Vinyl Chloride) Pipe for Existing Sewer and Conduit rehabilitation

C. PIPE DESIGN AND DIMENSION

1. Submittals: The Contractor shall furnish engineering data covering materials and installation procedures.

2. Unless otherwise specified, the Contractor shall determine the minimum and maximum length of liner to effectively span the distance from the inlet to the outlet of the respective pipelines.

3. The pipe liner shall have a nominal outside diameter and minimum wall thickness based upon project parameters and the condition of the host pipe.

D. SAFETY

1. The CONTRACTOR shall conform to all safety requirements of pertinent regulatory agencies, and shall secure the site for the working conditions in compliance with the same. The CONTRACTOR shall erect signs and devices as are necessary for the safety of the work site.

2. The CONTRACTOR shall also provide all of the WORK in accordance with applicable OSHA standards. Emphasis shall be placed upon the requirements for entering confined spaces and working with steam.

II. PRODUCTS

A. MATERIAL SPECIFICATIONS:

1. The PVC Fold-and-Form Pipe Liner will be manufactured from virgin PVC Fold-and-Form Pipe Liner compound, containing no fillers, and meet or exceed the following minimum physical properties:

a) COMBUSTIBILITY: Self-Extinguishing

b) FLEXURAL MODULUS: ASTM D 790 280,000 PSI @73F

c) FLEXURAL STRENGTH: ASTM D 790 5,000 PSI @73F

d) IZOD IMPACT: ASTM D 256 1.5 FT-LB/IN

e) CHEMICAL RESISTANCE: suitable under general sanitary sewer conditions

2. CHARACTERISTICS: The PVC Fold-and-Form Pipe Liner shall be designed to meet the following installation performance requirements:

a) The Pipe Liner shall be capable of expanding a full pipe size larger than the nominal diameter (ex: 8” to 10”) without splitting, or rupturing with the understanding that the pipe liner dimension ratio will increase when so expanded.

b) After being expanded by “blow-molding”, the installed Pipe Liner will match the configuration of the host pipe.

c) The Pipe Liner shall be capable of negotiating pipe line bends in the host pipe without splitting, rupturing, or wrinkling of the pipe liner material.

d) The pipe liner shall be dimensionally stable after cool-down.

e) Processing of the pipe liner shall cause no degradation of the pipe liner physical properties.

3. MARKINGS: The pipe liner shall be marked at maximum five (5) foot intervals indicating ASTM D 1784 cell classification, manufacturer, and size (diameter and SDR). Each production lot will be uniquely coded.

4. DIMENSIONS:

a) The Pipe Liner outside diameter will be manufactured substantially smaller than the inside diameter of the host pipe. The pipe liner shall be manufactured with sufficient excess wall thickness to allow the pipe liner to meet or exceed the DR requirements after being expanded by "blow-molding" within the host pipe.

b) Unless otherwise specified, the Standard Dimension Ration (SDR) of 4" to 15" diameter Pipe Liner will be SDR 35. 18" to 36" Pipe Liner will be specified by wall thickness. The Pipe Liner will be continuously extruded (no joints) at the factory to the minimum length required to effectively span the distance between access points, in accordance with actual distances which shall be field verified by the Contractor prior to manufacturing.

B. MATERIAL TESTING: Each production lot of Pipe Liner will be inspected and tested at the time of manufacture for defects is accordance with ASTM D 2444, and ASTM D 2152. All pipe liners shall conform to the specified dimensions. Material design properties shall be confirmed in accordance with ASTM D 790.

III. EXECUTION

A. HOST PIPE PREPARATION

1. The existing pipeline shall be cleaned of any obstructions and televised using CCTV immediately prior to installation of the pipe liner. The host pipe condition shall be acceptable to the ENGINEER as appropriate for lining prior to the insertion of the pipe Liner.

2. Prior to beginning the insertion of the pipe liner, the CONTRACTOR shall confirm that the host pipe is adequately cleaned.

B. INSTALLATION PROCEDURES:

1. The pipe liner manufacturer's installation instructions and procedures shall be followed during installation.

2. Point Repairs

a) Point repairs and obstruction removals shall be completed, as necessary, in order to enable lining.

3. Liner Insertion

a) The entrance to the host pipe shall be covered so as to provide a smooth surface to prevent damage to the Pipe Liner.

b) The Pipe Liner shall be positioned to enable it to naturally curve into the access point and the host pipe.

c) The insertion end of the Pipe Liner shall be sealed to inhibit fluids and solids form entering the lumen of the Pipe Liner.

d) Insert the Pipe Liner into the entry access point. Slowly feed the Pipe Liner from the supply reel, while simultaneously pulling the Pipe Liner at the exit access point, to minimize tension on the Pipe Liner. Maintain two-way communication between personnel at entry and exit access points to coordinate the rate of Pipe Liner supply and pulling operations.

e) Use a power winch and a steel cable connected to the pulling head as recommended by the manufacturer to advance the Pipe Liner.

4. Pipe Liner Processing and "Blow-Molding":

a) Process and "blow-mold" the PVC Fold and-Form Pipe Liner in accordance with the manufacturer's instructions for heating and expanding the Pipe Liner. Upon completion of processing and "blow-molding", the Pipe Liner shall fit tightly against the inside wall of the host pipe and be locked into the joints of the host pipe, if possible.

b) Temperature and pressure gauges shall be used at the insertion and termination access points to monitor internal conditions during Pipe Liner processing and "blow-molding".

c) Introduce pressurized steam to heat and relax the Pipe Liner in strict accordance with the recommendations of the Pipe Liner manufacturer.

d) Continue the application of steam while introducing compressed air to increase internal pressure on the Pipe Liner as recommended by the manufacturer. DO NOT ALLOW PRESSURE TO EXCEED 12 PSI, AS DAMAGE MAY OCCUR TO HOST PIPE.

e) Discontinue the use of steam while continuing the use of compressed air to maintain the internal pressure. Allow the Pipe Liner to cool below 100 F before releasing pressure.

5. Liner Termination:

a) During the pulling in place and "blow-molding" process, the PVC liner shall form a bell shape at each end effectively locking the liner in place.

IV. PAYMENT

A. Payment for PVC Fold and Form Pipe Liners will be made per linear foot as

1. PVC FOLD AND FORM PIPE LINER – 12 IN - ITEM 24860EC
2. PVC FOLD AND FORM PIPE LINER – 15 IN - ITEM 24861EC
3. PVC FOLD AND FORM PIPE LINER – 18 IN - ITEM 24862EC
4. PVC FOLD AND FORM PIPE LINER – 24 IN - ITEM 24863EC
5. PVC FOLD AND FORM PIPE LINER – 30 IN - ITEM 24864EC
6. PVC FOLD AND FORM PIPE LINER – 36 IN - ITEM 24865EC

B. Payment will be considered full compensation for all work, equipment, and incidentals necessary to install the pipe liners in accordance with this note.

SPECIAL NOTE

For Stream Relocation

Pulaski County
IMPROVE KY-461 FROM KY-80 TO BUCK CREEK BRIDGE, INCLUDING INTERCHANGE AT KY-80
Item No. 8-59.25/.26

) All stream relocation work for both Big Spring Branch and Flat Lick Creek must be the first construction activity performed.

2) Temporary stabilization measures must be in place along the newly constructed stream channels until final seeding takes place.

3) Upon completion of the construction of the new stream channels, and 5 working days before water is diverted from the old channels to the new, KYTC must be contacted. Contact Nathan Click (502-782-5009) and Andrew Logsdon (502-782-5021). Do not divert water without first successfully contacting KYTC.

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

SPECIAL NOTE

For Tree Removal

Pulaski County
IMPROVE KY-461 FROM KY-80 TO BUCK CREEK BRIDGE, INCLUDING INTERCHANGE AT KY-80
Item No. 8-59.25/.26

NO CLEARING OF TREES 5 INCHES OR GREATER (DIAMETER BREAST HEIGHT) FROM JUNE 1- JULY 31.

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

COMMONWEALTH OF KENTUCKY

TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

PULASKI COUNTY

ITEM NUMBER 8-59.25

TABLE OF CONTENTS

PROJECT DESCRIPTION

GENERAL

This project includes furnishing and installing WEB cameras on lowering pole. This equipment will replace the traffic monitoring and advisory capabilities of the District 8 and TRIMARC.

This ITS Project complies with the requirements of 23 CFR 940. The ITS work to be performed is referenced in the current Kentucky 2009 Statewide ITS Architecture at Appendix C-4,5 and C-4 (Traffic Incident Management System ATMS08, and Traffic Information Dissemination ATMS06), and in the Updated Section 5 and Appendix B of the 2009 Addendum to the Original Kentucky ITS Business Plan.

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

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

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

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

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

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

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

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

WARRANTY

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

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

TESTING

The contractor shall demonstrate proper functioning of all devices at the field communications demarcation point. After each device can be successfully operated at the field communications demarcation point the devices will be integrated into the TRIMARC Traffic Operations Center. A 30 day equipment burn-in test will begin after each device is integrated and can be remotely controlled from the operations centers. The Contractor is responsible for repairing or replacing defective equipment during the period between the field test and the start of the 30 day burn-in test.

The 30 day burn-in test will be conducted by TRIMARC from the operations center and consist of operational control of PTZ and video of the remote camera location.

If a device fails during the 30 burn-in day test, TRIMARC personnel will test the device at the field cabinet. If the device cannot be operated at the field cabinet the Contractor shall repair or replace the device and a new 30 day burn-in test will begin for that device.

The project will be accepted after all devices have completed their 30 day test successfully, acceptable as-built drawings and warranty information have been received.

SYSTEM COMPATIBILITY

The Contractor is responsible for coordinating with TRIMARC to insure equipment compatibility and to complete integration of equipment into the TRIMARC project.

COMMUNICATIONS

Camera shall communicate with the control center over the new phone lines and/or DSL connection (coordinated with the TRIMARC). The Contractor shall be responsible for furnishing and installing all conduits, junction boxes and communication cables installed on Kentucky right-of-way as specified in the plans. The Contractor shall be responsible for the installation and correct operation of all communications systems located in the field cabinet to the field devices. Testing of the Contractor's work will be performed both locally at the cabinet and remotely at the TRIMARC Traffic Operations Center. TRIMARC personnel will assist with any troubleshooting necessary to resolve problems with the communication equipment.

EQUIPMENT LIST

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

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

This list shall be provided to the Division of Traffic Operations and TRIMARC Systems Administrator prior to burn-in testing. See below for TRIMARC Info:

Mr. Todd Hood
TRIMARC Systems Administrator
901 W. Main St.
Louisville, KY 40202
Phone: 502-587-6624
Fax: 502-587-6645
Email: Todd.Hood@ngc.com

SHOP DRAWINGS

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

AS-BUILT DRAWINGS

The Contractor, at the completion of the project, shall submit as-built drawings. As-built drawings shall be submitted in electronic format such as .pdf, .tiff, .dgn or other standard image format acceptable to the Engineer. As-built drawings may be scanned from marked up field plans or drawn in MicroStation. As-built drawings shall be scanned at a resolution that will allow them to be clearly legible on a computer display. As-built

drawings shall include the exact location of all above ground equipment, underground conduit, wire, sensors and other equipment. Drawings shall indicate any changes to the design including changes to the numbers of conductors, wire gage, splices, additional conduit, etc. Conduit locations shall be drawn to scale or shall be dimensioned and referenced to permanent roadway features. Turns in conduit shall be referenced so that the conduit paths may be derived from the as-built drawings. Existing underground utilities shall be indicated on the drawings. Two copies of the drawings shall be submitted. One copy of the drawings shall be submitted to the Engineer. One copy of the drawings shall be submitted to the KYTC Division of Traffic Operations Design Services Branch. The Contractor shall correct any drawings that are deemed unacceptable to the Engineer. As-built drawings shall be delivered prior to burn-in testing.

SITE PREPARATION

DESCRIPTION

Site Preparation shall be performed in accordance with the plans, specifications and Standard Drawings.

MATERIALS

Site Preparation shall include all materials required to access and protect the work area.

INSTALLATION

The Contractor shall coordinate with the Engineer prior to performing any site preparation work. This item includes excavation, guardrail removal, guardrail replacement, temporary ditch crossings, temporary barriers and clearing of debris and foliage. Salvaged materials may be used at the discretion of the Engineer. Site preparation shall be one per VMS sign location/Web camera location. There shall not be site preparation for locations where services are installed (this is incidental to the installation of the service).

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

ADVANCED GROUNDING SYSTEM

DESCRIPTION

Furnish and install Advanced Grounding System in accordance with the plans, specifications and Standard Drawings.

MATERIALS

Unless otherwise specified, the grounding system provided will be as shown in "Advanced Grounding System Details". Minimum ground resistance reading needs to be 10 ohms or less as tested via the 3 point fall of potential test method.

If the installation of the advanced grounding system is not possible due to physical constraints of the location or other extenuating factors, the TRIMARC Engineer may allow for a standard ground installation. The standard installation would be with ground wiring consisting of solid bare copper #4 AWG and securely connected inside enclosures with #4 AWG copper clamp connectors. Nuts and washers securing the wire are not acceptable. All grounding shall meet the National Electric Code. Ground wires shall be exothermically welded to the ground rods. Ground rod clamps are not acceptable. The following devices shall be grounded to an array of two or three, 10' X 1" copper coated steel ground rods:

- Model 334/336 Enclosures (two ground rods required)
- Camera Poles (three ground rods required)
- Side-mounted VMS(two ground rods required)
- Service Locations(two ground rods required)

All ground rods in arrays shall have a minimum of 6' separation.

The resistance to ground shall be less than 10 Ohms as measured with an AEMC clamp on ground resistance meter or equivalent. The Contractor shall leave all exothermic welds exposed for inspection by the Traffic Engineer before backfilling.

INSTALLATION

All grounding shall be according to standards shown on "Advanced Grounding System Details". If contractor needs help with installation, they can contact Alltec Corporation for further assistance at 800-203-2658.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

POLE BASE

DESCRIPTION

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

MATERIALS

Pole Base includes concrete, anchor bolts, reinforcing steel, and conduit within base. The Contractor shall submit to material testing at the discretion of the Engineer.

INSTALLATION

The Contractor shall stake all proposed pole base locations and obtain approval before excavation. The TRIMARC Engineer will approve locations for pole bases. The Contractor shall have utilities marked in the field prior to requesting approval. The Contractor shall allow two weeks to schedule the location approval. TRIMARC approval of field device location does not relieve the contractor from his responsibility to avoid utilities and repair any damage to buried infrastructure. The Contractor shall grade and re-seed all disturbed areas and restore the area to the satisfaction of the Engineer. Poles located behind guardrail shall have a minimum 4' spacing from edge of pole to face of guardrail. Otherwise, poles shall be located as according to the plans sheets or a minimum of 30' from all driving lanes. This item includes all excavation including any special equipment required to install the base in rock. Near the pole base 3' wide x 3' long x 3' deep concrete pads will be required for the technician to stand on while accessing the hand hole. Concrete for the pad is incidental to this item. This item shall include a vented rodent barrier furnished and installed by the contractor. See Vented rodent barrier detail.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Pole Base/Pole Base-High Mast will be measured for payment per unit each. The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

POLE WITH LOWERING DEVICE

DESCRIPTION

Pole with lowering device shall be designed to support and lower/raise a CCTV camera, lens, housing, PTZ mechanism, cabling, connectors and other supporting field components without damage or causing degradation of camera operations. The lowering device and the pole are interdependent and thus, must be considered a single unit or system. The lowering device system shall consist of a pole, suspension contact unit, divided support arm, pole adapter for attachment to a pole top tenon, pole top junction box, and camera connection box. The lowering device to be furnished shall be the product of a manufacturer with a minimum of two years of experience in the manufacturing of such systems.

MATERIALS

LOWERING DEVICE

Lowering device shall be [MG]² Model CLDMG2, Camera Lowering Systems CDP series or approved equal.

SUSPENSION CONTACT UNIT

The suspension contact unit shall have a load capacity 200 lbs. with a 4 to 1 safety factor. There shall be a locking mechanism between the fixed and moveable components of the lowering device. The movable assembly shall have a latching mechanism with a minimum of two latches. This latching mechanism shall securely hold the device and its mounted equipment. The latching mechanism shall operate by alternately raising and lowering the assembly using the winch and lowering cable. When latched, all weight shall be removed from the lowering cable. The fixed unit shall have a heavy duty cast tracking guide and means to allow latching in the same position each time. The contact unit housing shall be weatherproof with a gasket provided to seal the interior from dust and moisture.

The prefabricated components of the lift unit support system shall be designed to preclude the lifting cable from contacting the power or video cabling. The only cable permitted to move within the pole or lowering device during lowering/raising shall be the stainless steel lowering cable. All other cables must remain stable and secure during lowering/raising operations.

The female side of the socket contact connector shall be made of thermosetting synthetic polymer. The connector shall be suitable for Ethernet type camera installation.. All wire shall be 18 AWG stranded. Pin contact half of connector shall be made of thermosetting synthetic polymer. All pins and wires shall be molded in place. A complete disconnect unit shall have two identical sets of 10 contacts each (20 contacts total). Male Pin contact halves shall be mounted to lower portion of disconnect unit.

The portable lowering device and pulleys for the lowering device shall have sealed, self lubricated bearings, oil tight bronze bearings, or sintered bronze bushings. The lowering cable shall be a minimum 1/8 inch diameter stainless steel aircraft cable with a minimum breaking strength of 1740 pounds and shall be 19 x 7 or 7 x 19.

All electrical and video connections between the fixed and moveable portion of the contact block shall be protected from exposure to the weather by a waterproof seal to prevent degradation of the electrical contacts. The electrical connections between the fixed and movable lowering device components shall be designed to conduct high frequency data bits, one volt peak-to-peak video signals, and power requirements for operation of dome environmental controls. A direct coax connection is acceptable but not required.

The interface and locking components shall be made of stainless steel or aluminum. All external components of the lowering device shall be made of corrosion resistant materials, powder-coated, galvanized, or otherwise protected from the environment by industry-accepted coatings to withstand exposure to a corrosive environment.

POLE MATERIALS

All materials and products shall be manufactured in the United States of America, and comply with ASTM or AASHTO specifications. Mill certifications shall be supplied as proof of compliance with the specifications.

POLE DESIGN
Pole design shall be in accordance with loading and allowable stress requirements of 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals",current edition. Loading shall be based on:

- basic wind speed of 90 mph
- 30 percent gust factor using
- design life/recurrence interval of 50 years
- fatigue category I.

The lowering device manufacturer shall furnish independent laboratory testing documents certifying adherence to the stated wind force criteria utilizing, as a minimum EPA, an EPA equal to or greater than that of the camera system to be attached. All drawings and detail analysis shall be submitted in detail demonstrating compliance with the AASHTO Specification.

To avoid vortex shedding, the steel pole members shall have a taper of 0.14 in/ft. All structures shall be designed to natural wind gust conditions. The yearly mean wind speed for natural wind gusts will be assumed to be 11.2 per hour.

Poles up to 50' in length shall be one-piece construction. Poles greater than 50' in length shall be of two-piece construction. Poles shall conform to ASTM A 595, Grade A minimum yield strength of 55 ksi, ASTM A 572 Grade 65, ASTM A 53. Pole, base plate, and all associated hardware shall be galvanized per ASTM A 123 or A 153. The shaft shall be round or 16 sided with a four inch corner radius and contain only one longitudinal seam weld. Circumferential welded tube butt splices and laminated tubes are not permitted. Longitudinal seam welds within 6 inches of complete penetration pole to base plate welds shall be complete penetration welds. The shaft shall be hot dip galvanized per the requirements of the contract documents.

The pole top deflection shall not exceed one inch in a 30-mph (non-gust) wind. The calculations shall include a pole, base plate, and anchor bolt analysis. The pole detail analysis shall be analyzed at the pole base, at 5-ft. pole intervals, and at each slip joint splice. Design shall be based on wind loading (EPA) from a CCTV assembly dome enclosure.

A detail analysis of the pole shall be submitted. The detailed analysis shall include, but not be limited to, the following calculations:

1. **Provide Group I, II, III, IV load combinations as listed in Table 3-1 Group Load Combinations in AASTHO.**

2. **Provide dimensions and weights for all attachments. This includes areas used for wind, ice and fatigue loads, drag coefficients, projected areas, velocity pressures and wind force for each segment.**
3. **For Group Loads II, III, and IV, which have wind loads, provide calculations for each controlling "worst case" wind direction that controls any aspect of the design (anchor bolts, pole sizing, ect.)**
4. **Anchor Bolts shall be designed for the orientation that would provide the maximum stress on any individual bolt.**
5. **Provide all structural properties for poles, anchor bolts and base plates. This includes the poles diameter, thickness, section modulus, moment of inertia, and cross sectional area.**
6. **Calculations for each member shall include loads, section properties, member forces (axial, shear and bending), member deflections (angular and linear), member stresses (actual and allowable), and the combined stress ratio (CSR).**
7. **Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from Table 11-2 in AASHTO.**
8. **In fatigue calculations, the effective throat thickness of a complete joint penetration groove weld shall be the thickness of the thinner part joined per AISC J2.1a.**

Provide steel strain poles with a permanently affixed label 6 feet from the bottom of the base plate on the outside with the following information:

manufacturer
height
minimum stringing tension at yield
order number, and
maximum deflection rate.

Provide detailed calculations of the pole. The detailed calculations shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.

POLE HAND HOLES

The pole hand hole opening shall be reinforced with a minimum 2-inch wide hot rolled steel rim. The nominal outside dimensions shall be 6.5 inches x 27 inches. The handhole shall have a tapped hole for mounting the portable winch as shown on the drawings.

The handhole cover shall be removable from the handhole frame. On the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7 gauge stainless steel to provide adjustability to insure a weather-tight fit for the cover. The handhole shall

have a 3' L x3' W x4" D concrete pad install beside the opening of the handhole. Concrete for the pad is incidental to this item.

POLE TOP TENON

A tenon shall be welded to the pole top with mounting holes and slot as required for the mounting of the lowering system. The tenon shall be of dimensions required to facilitate camera lowering device component installation. Each slot shall be parallel to the pole centerline for mounting the lowering device.

POLE CABLE SUPPORTS

Electrical Cable Guides and Parking Stand (Eyebolts): Top and bottom electrical cable guides shall be located within the pole and aligned with each other as referenced in the drawings. One cable guide shall be positioned 2 inches below the handhole and the other shall be positioned 1 inch directly below the top of the tenon. A parking stand shall be positioned 2.75 inches below the top of the handhole.

BASE PLATE

Provide base plates that conform to ASTM A36 for grade 36 or ASTM 572 for grade 50. Ensure transverse plates have a thickness ≥ 2 inches. Provide a base plate for the vertical pole that fits inside a 48 in diameter concrete base. Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration butt weld with backup bar. Plates shall be hot dip galvanized per the requirements of the contract documents.

POLE ANCHOR BOLTS

The anchor bolt design shall follow the NCHRP Report 494 Section 2.4 and NCHRP 469 Appendix A Specifications. Use anchor bolts that conform to the requirement of ASTM F 1554 grade 55 for hooked smooth bars or grade 105 for headed. Anchor bolts shall conform to AASHTO M 314 grade 55. Anchor bolts and all associated hardware shall be fully galvanized per ASTM A 153. . Each anchor bolt shall be supplied with two hex nuts and two flat washers. The strength of the nuts shall equal or exceed the proof load of the bolts. For anchor bolt design, pole forces shall be positioned in such a manner to maximize the force on any individual anchor bolt regardless of the actual anchor bolt orientation with the pole. There shall be two steel templates (one can be used for the headed part of the anchor bolt when designed in this manner) provided per pole. Templates shall be contained within a 26.5 inch diameter. All templates shall be fully galvanized (ASTM A 153). Anchor bolt lengths should be based on NCHRP Report 494 Section 2.4.5.5 using #8 bars for the foundation reinforcing steel. The headed anchor bolt assembly shall be contained within 26.5 inch diameter. Minimum edge distance for bolt holes shall follow Table J3.4 of AISC Steel Construction Manual. NCHRP Report 494:
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_494.pdf

NCHRP Report 469:
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_469-a.pdf

POLE WELDING

All welding shall be in accordance with Sections 1 through 8 of the AWS D1.1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and shall be visually inspected. Tube shall contain only one longitudinal seam weld. Longitudinal welds suspected to contain defects shall be magnetic-particle inspected by the manufacturer. All circumferential butt-welded pole and arm splices shall be ultrasonically or radiographically inspected by the manufacturer.

This item includes all assembly, mounting hardware, wiring, grounding, and mechanical and electrical adjustments. Due to the electrical connections involved, the CCTV Assembly must be installed to properly test the lowering device. The contractor shall demonstrate to the Engineer the proper and repeated operation of the lowering device. Proper camera operation and electrical connections shall be verified after each lowering/raising cycle.

INSTALLATION

POLE

Pole shall be installed in the correct orientation and plumb. Pole shall be grounded in accordance with the plans and specifications. Damaged galvanizing shall be repaired with a paint approved by the Engineer. The pole shall have a 3' L x3' W x4" D concrete pad install for each door. Concrete for the pad is incidental to the cabinets. The Contractor shall grade and re-seed all disturbed areas to the satisfaction of the Engineer. This item includes the furnishing and installing of Fastrac bait bag in each pole for rodent control.

CAMERA BALANCING

The Camera shall be weighted and balanced to assure that the alignment of pins and connectors are proper for the camera support to be raised into position without binding. The lowering unit shall have sufficient weight to disengage the camera and its control components in order that it can be lowered properly.

CAMERA CONNECTIONS

The Contractor shall be responsible for meeting the Ethernet and power requirements and camera (120 volt, 18 AWG minimum).

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

PORTABLE WINCH LOWERING TOOL

DESCRIPTION

Furnish Portable Winch Lowering Tool in accordance with the plans, specifications and Standard Drawings.

MATERIALS

Portable winch lowering tool shall be made of durable and corrosion resistant materials, powder coated, galvanized, or otherwise protected from the environment by industry-accepted coatings to withstand exposure to a corrosive environment. The tool shall consist of a lightweight metal frame and winch assembly with cable as described herein, a quick release cable connector, an adjustable safety clutch and a variable-speed, industrial-duty, battery powered drill motor. The tool shall be compatible with the winch accessible through the hand hole of the pole. When attached to the winch, the tool shall support itself and the load assuring raising/lowering operations and provide a means to prevent freewheeling when loaded. The tool shall have a reduction gear to reduce the manual effort required to operate the lifting handle to raise/lower a capacity load. The tool shall be provided with an adapter for operating the lowering device by a portable drill using a clutch mechanism. The tool shall be equipped with a positive locking mechanism to secure the cable reel during raising/lowering operations.

INSTALLATION

No installation is required. Portable winch lowering tools shall be delivered to a location determined by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

FIXED WEB CAMERA ASSEMBLY

DESCRIPTION

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

MATERIALS

The Fixed Web Camera Assembly shall be an Axis Network Dome Model Q5654-E or approved equivalent. This item shall include the color camera, zoom lenses, environmental enclosure, pan/tilt unit, housing, dome, parapet mount, and all mounting hardware, POE power cable, connections, and incidentals necessary to complete the work.

Proposed alternates shall be commercially available. The Contractor shall identify an installed site where the proposed alternate Web Camera Assembly has been operating for a period of at least one year in a similar climate region. The contractor shall supply a spare camera/POE and deliver it to Trimarc.

INSTALLATION

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

WEB CAMERA ASSEMBLY

DESCRIPTION

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

MATERIALS

The Web Camera Assembly shall be an Axis Network Dome Model Q5654-E or approved equivalent. This item shall include the color camera, zoom lenses, environmental enclosure, pan/tilt unit, housing, dome, parapet mount, and all mounting hardware, POE power cable, connections, and incidentals necessary to complete the work.

Proposed alternates shall be commercially available. The Contractor shall identify an installed site where the proposed alternate Web Camera Assembly has been operating for a period of at least one year in a similar climate region. The contractor shall supply a spare camera/POE and deliver it to Trimarc.

INSTALLATION

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

VIDEO SURVEILLANCE CONTROLLER

DESCRIPTION

Furnish Video Surveillance Controller in accordance with the plans, specifications and Standard Drawings.

MATERIALS

The Video surveillance controller shall be compatible with supplied Web Camera Assemblies. The controller shall include handheld installation display (Axis T8412 or approved equal) and video surveillance joystick (Axis 295 or approved equal) or as follows:

Handheld installation display

- 3.5 inch color LCD
- Resolution: 320x240
- Image settings: autosensing
- IP settings: Static IP address, DHCP
- 128 MB RAM
- Battery: rechargeable
- Connectors: BNC in, RJ-45, CAT-5 USB 2.0, PoE
- Local Storage: Micro SD card (should include 8 GIG Micro SD with reader)
- Accessories: Soft carrying case with sunshield, built-in stylus, terminal block for CAT-5, Ethernet cable, BNC cable , car charger 12 V DC, power supply.

Video Surveillance Joystick

- Hall-effect joystick with three axes
- PTZ compatible
- Joystick travel: X/Y-axis +- 18 degrees, Z-axis +- 40 degrees
- Housing: High impact ABS
- Power: Via USB interface (5V DC)
- Operating conditions: -25 to 85 degrees Celsius
- Approvals: EN 55024:1998, EN 55022, FCC Part 15 Subpart B Class B
- Connectors: USB A
- Supported protocols: USB 2.0, DirectX

INSTALLATION

There will be no installation required. Items should be delivered to TRIMARC personnel.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

UNINTERRUPTIBLE POWER SUPPLY (RACK MOUNTED UPS)

DESCRIPTION

Furnish and install Uninterruptible Power Supply in accordance with the plans, specifications and Standard Drawings.

MATERIALS

The Uninterruptible Power Supply shall be provided emergency power to the load when the input power sources fails. The Uninterruptible Power Supply shall be APC UPS 1500VA USB RM 2U (networkable card AP9630) or approved equal. The Uninterruptible Power Supply shall be networkable and have the following technical specifications:

Output Power Capacity: 980 Watts/ 1440 VA
Nominal Output/Input voltage: 120 Volts
Efficiency at Full Load: 95%
Waveform Type: Sine Wave
Output/Input Connections: (6) NEMA 5-15R
Battery Type: Maintenance-free sealed Lead-Acid Battery with suspended electrolyte:leakproof

Interface Ports: DB-9 Rs 232, USB

Surge Energy Rating: 459 Joules
Filtering: Meets UL 1449
Mounting: shall be able to mount in 19" rack
Operating Environment: 0-40 degrees Celsius
Regulatory Approvals: CSA, FCC Part 15 Class A, UL 1778
Warranty: At least 3 year for repair or replace

Network card shall have the following:

Protocols: HTTP, HTTPS, IPv4, SMTP, SNMP v1, SNMP v3, SSH V1, SSH V2, SSL, TCP/IP, Telnet
Network Interface Connections: RJ-45 10/100 Base-T
Regulatory Approvals: AS/NZS 3548 (C-Tick) Class A, EN 55022 Class A, En 55024, FCC Part 15 Class A, GOST, ICES-003, VCCI Class A
Warranty: At least 3 year for repair or replace

INSTALLATION

Uninterruptible Power Supply shall be installed in 334/336 Cabinet as specified in the plans sheets. It shall be securely mounted the 19" frame which is included in supplied 334/336 cabinet. All cables, rack Mounting Brackets, Rack Mounting support rails shall be incidental to the item.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

COMMUNICATIONS CABLE

DESCRIPTION

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

MATERIALS

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

- ANSI/TIA/EIA 568B (Category 5e)
- MIL-C-24640A Water Penetration
- Propagation Delay: 583 ns @ 100 MHz
- Return Loss @ 100 MHz: 20.1 DB

- Frequency Range: 1-350 MHz

Physical characteristics:

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

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

INSTALLATION

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

CONDUIT

DESCRIPTION

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

MATERIALS

Conduit shall be rigid steel, schedule 80 PVC, or flexible, non-metallic conduit as specified. This item includes fittings, connectors, clamps, caps and other materials necessary for proper installation. The Contractor shall submit to material testing at the discretion of the Engineer.

INSTALLATION

All conduit installed above ground or below ground under pavement shall be rigid steel. All conduits installed below ground, not under pavement shall be PVC. Flexible, non-metallic conduit shall be used as required and shall be incidental to the project. Unused conduits shall be capped on both ends. Conduit containing wire or cable shall be sealed

with a piece of steel wool and capped off with duct seal putty. All conduits shall be accessible inside junction boxes. All conduits shall have bushings included. If rigid steel conduit, the bushings shall be bonded together with other similar types of conduits.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

ELECTRICAL SERVICE

DESCRIPTION

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

MATERIALS

The Contractor shall coordinate with the local power company to determine the exact materials for the service. This includes but is not limited to conduit, meter base, stainless steel disconnect, fused cutout, ground rod, wire, 45 foot wood pole, 2 anchors, connectors, fittings and all associated hardware required to construct the service. For Jefferson/Oldham, The local power company has stated that all new services will be 3 wires and care should be taken to install the meter in a direction it can be easily read. Some locations will require an AWR meter. This include structures and concrete shown on the plan sheets.

INSTALLATION

The Contractor shall coordinate with the local power company and coordinate with TRIMARC representative for the exact location of the service. This item also includes all electrical inspection and other fees required to provide electrical service.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

MODEL 334 AND 336 ENCLOSURES

DESCRIPTION

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

MATERIALS

The two types of enclosures are Model 336 (36" H x 24" W x 22" D) and Model 334 (66" H x 24" W x 30" D). All enclosures shall be NEMA 3R rated. The enclosures shall include: all mounting accessories, access doors (minimum of two doors), ventilation, locking system, handles, door stops, rack assembly, light(s), shelves, drawer, and all required peripherals per the requirements of the contract documents and per the equipment submitted by the Contractor. **The contractor shall provide a cabinet, wiring, and all components that are approved as an assembly. This approved assembly shall be incidental to this item. Verification that the cabinet, wiring, and all components are an approved assembly shall be submitted to Central Office Traffic Operations.**

This item includes all excavation and any special equipment required to install the enclosure on a pole for a Model 336 enclosure or construct the concrete base for a Model 334 enclosure.

The Contractor shall provide a terminal facility harness by means of mating "MS" type connectors for interconnections of the field equipment specified. All cabinets of the same type shall be identical in size, shape and quality. In addition, the cabinets shall be equipped internally as specified herein and as required to suit the specific equipment specified on the plans.

Cabinets shall be of welded construction, using 0.125" minimum thickness 5052H32 or equivalent sheet aluminum. The equipment design shall utilize the latest available techniques, minimum number of different parts, subassemblies, circuits, cards and/or modules to maximize standardization and commonality.

Cabinets shall be provided with fully wired back and side panels with all necessary terminal boards, wiring harnesses, connectors and attachment hardware. All equipment shall be shelf or 19" rack mounted. Terminals and panel facilities shall be installed on the lower portion of the cabinet walls below all shelves.

Each field cabinet shall, at a minimum, be supplied with the following:

- Fan and Thermostat
- Left Side Power Distribution Panel
- Air Filter
- Adjustable Shelves (1-4 as needed for equipment submitted by the Contractor)
- Back Panel
- Right Side Panel
- Locking System
- Ground Bus (2)
- Terminal Blocks
- Duplex power outlet
- Drawer that slides out for supporting a laptop computer
- All necessary installation and mounting hardware

All external screws, nuts and locking washers shall be stainless steel; no self-tapping screws are permitted unless specifically approved by the Engineer. All screws, nuts and locking washers used internally shall be manufactured from corrosion resistant materials.

All parts of the cabinet shall be cleaned, smoothed and free from flaws, cracks, dents and other imperfections. The cabinet shall be rigidly constructed to provide vibration free

operation of the field equipment when installed. The cabinets shall be dust and rain tight and capable of maintaining a dry internal condition when subject to rain and wind gusts.

All components shall be made of corrosion resistant materials such as plastic, stainless steel, aluminum or brass; or shall be treated with corrosion resistance such as cadmium plating or galvanizing. All materials shall be resistant to fungus growth and moisture deterioration.

Individual cabinet components shall be pre-assembled upon installation in the cabinet such that the components can be easily replaced in the field. Modules of unlike function shall be mechanically keyed to prevent insertion into the wrong socket or connector.

Panels shall be designed to mount in the cabinet on mounting studs. It shall not be necessary to remove the panel to replace any panel-mounted equipment. The panels shall be capable of supporting specified equipment mounted on the panel. A lower input termination panel shall be provided to terminate all input field wires.

Electronic components shall meet the requirements contained herein and shall, at a minimum, comply with EIA Specifications. No component shall be of such design, fabrication, nomenclature or other identification as to preclude the purchase of said component from a wholesale electronics distributor or from the component manufacturer.

Components shall be down-rated by 50 percent with regard to ambient temperature, applied voltage, and power dissipation. All circuits shall be designed for reliability and maximum performance.

The design life of all components, under continuous operating conditions in their circuit application, shall be a minimum of ten years.

Each component shall meet all of its specified performance requirements when the input power is AC, 60 Hz, single phase, 120 volts +/- 20 volts. The equipment shall be designed such that the failure of a particular piece of equipment will not cause the failure of any other.

The cabinets shall be furnished with a power distribution panel mounted on the lower left hand inside wall when facing the front of the cabinet. This panel shall include a 115 VAC, convenience, dual outlet with integral ground fault interrupt protected by a circuit breaker. The left panel shall have:

- Circuit Breaker(s)
- Radio Interference Suppressor
- Power Cable Input and Junction Terminals

Circuit breakers shall be approved and listed by UL. Each cabinet shall have, at a minimum, a circuit breaker to protect the lamp, vent fan, and dual outlet. In addition, a properly rated equipment circuit breaker(s) shall be provided for the equipment shown on the plans. At each cabinet that houses VMS control equipment, a 220 VAC circuit breaker, sized to suit the cables that provide power to the VMS pixels shall be furnished and installed. Breakers shall have a minimum interrupt capacity of 50 amperes.

Each cabinet shall be equipped with a radio interference suppressor installed at the circuit breaker. The suppressor shall provide a minimum attenuation of 50 dB over a frequency range of 200 kHz to 75 MHz. The suppressor shall be hermetically sealed in a case filled with a suitable insulation compound.

The suppressor terminals shall be nickel-plated, with brass studs of sufficient external length to provide space for connection of two appropriately sized conductors and shall be mounted such that the terminals cannot be turned in the case. The suppressors shall be designed for operation at the proper current ampere rating as determined by the Contractor per the equipment specified on the plans and shall be approved by UL and EIA.

Power distribution blocks suitable for use as a power feed and junction points shall be furnished and installed for two and three wire circuits. The line side of each circuit shall be capable of handling the specified number of and size of all wires.

Each cabinet shall include a fully wired equipment panel mounted on the lower rear inside of the wall of the cabinet. The back panel shall be utilized to distribute and properly interconnect all cabinet wiring related to the specific equipment. Each piece of equipment specified shall have its cable harness properly connected at terminal boards on the back panel. All functions available at the equipment connector shall be carried in the connector cable harness to a terminal board point on the back panel.

Wiring shall be provided for the equipment specified. All cabinet wiring, where connected to terminal strips, switches, radio interference suppressor, etc., shall be identified by the use of insulated pre-printed sleeving (wire markers) slipped over the wire before attachment of the lug or terminating the connection. The wire markers shall have a text label with sufficient detail so that a translating sheet is not required.

All wires shall be cut to the proper length before assembly. No wires shall be doubled back to take up slack. Wires shall be neatly secured with nylon lacing or cable ties. Cables shall be secured with nylon cable clamps.

The grounded side of the electric service shall be carried throughout the cabinet to the ground bus without a break.

All electrical connections in the cabinet shall have sufficient clearance between each terminal and the cabinet to prevent a leakage path or physical contact under stress. Where these distances cannot be maintained, barriers must be provided. All equipment grounds shall run directly and independently to the ground bus. The lay of the interconnect cable between the components must be such that when the door is closed, it does not press against the cables or force the cables against the various components inside the cabinet. Sufficient length of cable harnesses shall be provided to easily reach the electronic equipment placed anywhere on the shelves.

All wiring containing line voltage AC shall be routed and bundled separately and/or shielded from all low voltage (i.e. control) circuits. All conductors and live terminals or parts, which

could be hazardous to maintenance personnel, shall be covered with suitable insulating materials.

All conductors used in the cabinet wiring shall be 22 AWG or larger with a minimum of 19 strands. The insulation shall have a minimum thickness of 10 MILS. All wiring containing line voltage shall be 14 AWG or larger.

The AC+, AC-, and equipment ground wiring shall be electrically isolated from the other by an insulation resistance of at least 10 Megohms when measured at 250 VAC. Return and equipment grounding wiring shall be color-coded white and green respectively.

Terminal blocks located on the panels shall be accessible such that it shall not be necessary to remove the electronic equipment from the cabinet to make a connection or perform an inspection.

Terminal blocks shall be two-position, multiple-pole, and barrier type. Shorting bars, along with integral marking strip, shall be provided. Terminal blocks shall be arranged such that they do not impede the entrance, training, or connection of incoming field conductors. All terminals shall be identified by legends permanently attached to the terminal blocks. Not more than three conductors shall be brought to any one terminal screw. No electrically live parts shall extend beyond the protection afforded by the barriers. All terminal blocks shall be located below the shelves.

AC terminal blocks shall be Underwriter's Laboratory approved for 600 volts AC minimum and shall be suitable for outdoor use. Terminals used for field connections or interwiring connections shall secure conductors by means of a nickel or cadmium plated brass binder head screw.

All connections to and from the electronic equipment shall terminate at an interwiring block. These blocks shall act as intermediate connection points for all electronic equipment inputs and outputs.

A varistor shall be installed across the thermostat used to control the fan to act as a surge and transient noise suppressor. The varistor shall be GE VI5OLAIOA, Stetron 250NRO7-1, Siemens SIOK150, or approved equal.

MOUNTING

Model 336 cabinets shall be pole mounted or mounted to an existing concrete wall as specified. Model 334 cabinets shall be mounted on a poured concrete base or on existing concrete surfaces as specified. All holes drilled into existing concrete surfaces shall penetrate the concrete no more than 4 inches unless otherwise approved by the Engineer. Bolts inserted into any concrete surface shall be properly secured and epoxied, per manufacturer's recommendations. Prefabricated fiberglass bases used in lieu of poured concrete bases must be approved by the Engineer. Cabinet installation shall conform to the details shown. All cabinets shall be furnished with stainless steel mounting plates, nuts, bolts, washers and all other necessary hardware to mount the cabinet as shown or described.

DOORS

All cabinets shall be provided with doors in the front and back. Doors shall have secure gaskets to prevent the entrance of dust and moisture. Doors shall be sized to encompass the full area of the cabinet opening. Doors shall be provided with two stop positions to hold the door open at 90 degrees and 135 degrees. The stops shall hold the door securely open until released manually. The front door shall be hinged on the right-hand side by means of three butt hinges with 1/4" minimum stainless steel hinge pins.

VENTILATION

Cabinets shall be furnished with louvers properly designed to provide natural ventilation to the interior. The louver area shall be of sufficient size to permit the free flow of air corresponding to the rated capacity of the associated cabinet fan. A pleated media fiber filter shall be provided and shall cover all louvers.

Cabinets shall be furnished with an electric, thermostatically-controlled ventilation fan or fans mounted in the cabinet. The fan(s) shall have a rated capacity of at least 200 cubic feet per minute. The fan and cabinet ventilation louvers shall be located with respect to each other so as to direct the bulk of the air flow throughout the entire cabinet and, in particular, over the field equipment units. The thermostat shall be adjustable to turn on between 90 degrees and 120 degrees Fahrenheit.

LOCKING SYSTEM

Each door shall be furnished with a 3-point positive locking system. The lock for the door shall be a self-locking, heavy-duty, five-pin tumbler cylinder rim type. The handles shall be made of stainless steel and shall be provided with a padlock feature. Locks shall be keyed identically to Corbin #2. Two keys shall be provided for each cabinet.

LIGHT

A fluorescent light shall be provided in front for all cabinets and also in the back for Model 334 cabinets. A panel mounted 40-Watt weatherproof incandescent lamp with an on-off switch shall be positioned to provide light to the face of the equipment installed in the cabinet.

SHELF/DRAWER/RACK

A removable 19" EIA rack shall be provided for mounting sub-assemblies in Model 334 cabinet. Adjustable shelves shall be provided to hold the equipment. Vertical shelf adjustment intervals shall be 2" maximum. The shelves shall be positioned from the top of the cabinet in accordance with the actual equipment configuration of the particular cabinet. All devices/sub-assemblies shall be mounted on the rack if possible. Otherwise, they shall be placed on the shelves.

A sliding drawer shall be provided in each cabinet. The drawer shall be installed below the shelves in a suitable position for placement of a laptop computer. The drawer shall have a nominal depth of 1" and a hinged lid.

LABELING

The letters "KYTC ITS" shall be permanently displayed along the top of each door on the outside of each cabinet. The letters shall be a minimum of 1" tall. The letters shall be die-cut or engraved into the metal before galvanizing and shall be readable after galvanizing. All excess galvanizing shall be brushed off. The location and description of the label must be shown on the shop plan submittal for the cabinets. Stenciling with paint or other markers is not permitted. If required information is placed on a steel plate, the plate must match the surface profile of the cabinet. The plate must then be welded completely around the plate before galvanizing.

QUALITY ASSURANCE PROVISIONS

The following water spray test shall be performed on each empty cabinet: Water shall be sprayed from a point directly overhead at an angle of 60° from the vertical axis of the cabinet. This procedure shall be repeated for each of eight equally spaced positions around the cabinet for a period of not less than five minutes in each position. The water shall be sprayed using a domestic type-sprinkling nozzle at a rate of not less than one gallon per minute per square foot of the cabinet's surface area. The cabinet shall then be inspected for leakage. Evidence of water leakage shall be cause for rejection.

A manufacturer's certification of successful completion of the water spray test and that the cabinet conforms to these specifications shall be the basis of acceptance of the cabinet. Separate submission of test cabinets shall not be required.

MAINTENANCE

All components and assemblies shall be clearly identified with name, model number, serial number and any other pertinent information required to facilitate equipment maintenance.

All equipment shall be designed for ease of installation and maintenance. Location, accessibility, serviceability and features that will lead to simplified maintenance shall be a prime consideration. All component parts shall be readily accessible for inspection and maintenance. The only tools and test instruments required by maintenance personnel shall be simple hand tools and basic meters.

After the wiring is complete, all conduit penetrations into the cabinets shall be sealed in such a manner as to prevent rodents and insects from entering the cabinet. The conduit sealants and insect traps used shall be approved by the Engineer prior to installation.

COMMUNICATION

Contractor shall furnish and install wireless router, antenna, antenna cabling, power supply, data cables, all connectors, and hardware required for communication. The wireless router shall be installed in the web camera cabinet or main cabinet. The wireless router shall be sierra wireless airlink rv55 (part no. 1104303) with ethernet add-on and shall support verizon/att 3g/4g/lte services for the camera installation. The antenna should be mobile mark multi-band diversity/mimo antenna, lte & gps with 60" cables(part no. Ltb-301-3c3c2c-gry-60)

The contractor shall deliver the router to central office traffic operations for provisioning on the kytc apn. The cabinet will provision the router within 4 weeks of receipt and return via mail to the contractor. The cabinet will pay the monthly data plan charges. The cabinet will allow temporary access to the router until the close of the contract for configuring of the monitoring system.

The contractor shall deliver the wireless router to central office traffic operations for provisioning on the kytc apn. The cabinet will provision the router within 4 weeks of receipt and return via mail to the contractor. The cabinet will pay the monthly data plan charges. All system components shall arrive at the job site completely factory pre-wired and ready for field installation. All connections shall be clearly and permanently labeled to facilitate correct and easy termination of equipment. The routers and antennas will be incidental to the 334/336 cabinet bid item. All system components shall arrive at the job site completely factory pre-wired and ready for field installation. All connections shall be clearly and permanently labeled to facilitate correct and easy termination of equipment.

DOCUMENTATION

Each field cabinet shall be supplied with three copies of the final cabinet wiring diagram. One copy shall be placed in a clear plastic envelope and left in the cabinet drawer. Two sets of Mylar plans shall be delivered to the Engineer.

INSTALLATION

Model 334/336 enclosure shall be installed in accordance with the plans and specifications. The Contractor shall stake all proposed enclosure locations and shall obtain approval of staked locations before excavation. A representative from the KYTC Division of Traffic Operations, Design Services Branch or the Traffic Engineer, District 8, TRIMARC representatives will approve locations for all field devices. The Contractor shall have all utilities marked in the field prior to requesting approval. The Contractor shall allow two weeks to schedule this location approval with TRIMARC. TRIMARC approval of field device locations does not relieve the contractor from his responsibility to repair any damage incurred during construction. Enclosures located behind guardrail shall have minimum 5 foot spacing from edge of pole to face of guardrail. Otherwise, enclosures shall be located as specified on the plan sheets or a minimum of 30' from all driving lanes. All materials shall be installed in a neat and professional manner. All pole mount cabinets shall be mounted approximately 42" from the ground. All 336 pole mounted cabinets shall a 3' L x3' W x4" D concrete pad install for each door. Concrete for the pad is incidental to the cabinets. The Contractor shall grade and re-seed all disturbed areas to the satisfaction of the Engineer. This item includes the furnishing and installing of Fastrac bait bag in each cabinet for rodent control.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Model 334/336 Enclosure will be measured for payment per unit each. The Department will make payment for complete, functioning, inspected, and accepted quantities. The

Department will consider payment as full compensation for all work required under this section.

JUNCTION BOX

DESCRIPTION

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

MATERIALS

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

INSTALLATION

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

SURGE DEVICES

DESCRIPTION

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

MATERIALS

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

VIDEO SIGNAL COAX CONDUCTOR SURGE DEVICE
Video Signal Coax Conductor Surge Device shall be EDCO CX12-BNC-Y or approved equal. This surge protector shall:

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

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

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

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

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

100 BASE-T AND 10 BASE-T COMMUNICATION DATA SIGNAL CONDUCTOR SURGE DEVICE
Data Signal Conductor Surge Device for 100BaseT and 10BaseT Communication conductors shall be EDCO LCDP-30 or approved equal. This surge protector shall:

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

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

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

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

INSTALLATION

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

TRENCHING AND BACKFILLING

DESCRIPTION

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

MATERIALS

All trenches shall be marked with underground utility warning tape.

INSTALLATION

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

VARIABLE MESSAGE SIGN- SIDE MOUNT

DESCRIPTION

Furnish and install Variable Message Sign in accordance with the plans, specifications and Standard Drawings.

This Specification describes minimum specifications for the VMS side mount required by the contract. The Contractor shall provide all materials, software, and services necessary to deploy a VMS side mount unit that fully complies with the requirements specified herein, including incidental items required for operation that may have been inadvertently omitted. The VMS side mounted sign shall be the same manufacturer as the variable message sign item.

VMS shall be 3 lines by 10 characters with 1 pixel spacing between each character in 7x4 font size. VMSs shall use amber LED displays to generate 18" characters. VMS enclosures shall be a front access type.

PRE-BUILD HARDWARE SUBMITTAL

A hardware submittal shall be provided prior to production of the equipment to verify that the design operates using the NTCIP. This test will be conducted by the KYTC ITS Integrator. The VMS manufacturer shall supply a VMS controller, power supply, three display modules, and any other equipment required for bench operation of the VMS unit. This equipment will be returned after testing is complete. The VMS manufacturer shall provide documentation and support for all NTCIP components unique to the design.

The pre-build submittal shall also include the following background information regarding the VMS manufacturer:

- Full corporate name
- Corporate address
- Contact person name, telephone number, fax number, and email address
- Names and qualifications of the primary project team members, including the following: sales person, project manager, product manager, application engineer, and manufacturing manager
- Number of years in business under the current corporate name
- Copy of the VMS manufacturer's in-house, quality management system. The in house quality management system shall be ISO 9001:2000 certified. Proof of this shall be submitted with the shop drawings
- Proof of certification of VMS manufacturer's welding procedure to ANSI/AWS D1.2/D1.2M-03 Structural Welding Code for Aluminum
- Proof of certification of all welders to ANSI/AWS D1.2/D1.2M-03 Structural Welding Code for Aluminum
- Name, phone number and address of ANSI/AWS Certified Welding Inspector

- General corporate literature
- VMS product literature

Documentation proving the VMS manufacturer complies with these specifications shall be provided with the pre-build technical submittal. This submittal shall also include references from three other states that have had NTCIP-compliant VMS from the manufacturer installed for a minimum of two years and project information for all of the manufacturer's VMS customers of the last five years, including:

- Equipment owner/operator agency name
- Contact person name, telephone number, fax number, and email address
- VMS unit name and location of operations control center (project name/number, roadway name/number, state, county, and country)
- VMS commissioning date (first date of successful on-site operation)
- VMS quantity
- VMS display pixel technology (LED, fiber optic, flip disk, etc.)
- VMS display matrix size (pixel rows by pixel columns) and type (full matrix, line matrix, or discrete character)
- VMS housing access type (walk-in, front, rear, or other specific access type)
- Communications protocol used (NTCIP or proprietary; if proprietary, provide a name or description)
- Type of communications backbone used (telephone, fiber optic, direct, etc.)
- NTCIP compliance test reports, including contact information, prepared by independent testing companies.

KYTC reserves the right to contact additional references. Any poor or unsatisfactory reference, as determined by KYTC in its sole and absolute discretion, may cause the LED VMS manufacturer to be rejected.

Experiences in the manufacture of other types of electronic sign products will not satisfy the requirements of this VMS specification. Other types may be, but are not limited to:

- Indoor signs of any size or type
- Portable or mobile signs of any size or type
- Neon signs
- Back-lit signs
- Rotating drum or plank signs
- Blank out signs
- Any type of sign that is not pixilated and cannot be programmed to display a nearly infinite quantity of messages
- VMS that have a pixel technology comprised of something other than high-intensity LEDs such as incandescent lamps, liquid crystal, fiber optic, flip disk, flip-fiber combination, and flip-LED combination
- VMS with a display matrix smaller than three lines of fifteen characters per line and having a character height smaller than 18 inches.

- Outdoor electronic signs that are used for purposes other than roadway/motorway traffic management

  Failure to provide complete and accurate submittal information, as specified herein, shall be cause for rejecting the VMS manufacturer.

PRE-BUILD TECHNICAL SUBMITTAL

The VMS manufacturer shall provide a complete pre-build technical submittal within 60 days of contract award and shall not proceed with VMS manufacture until the Engineer has approved the submittal. The submittal shall include:

- All VMS manufacturer qualification information, as specified herein
- VMS shop drawings, including illustrations of the recommended installation method
- VMS structural calculations and certification by a registered professional engineer after the submittal has been approved
- VMS site riser diagram
- AC site power requirements, including the number of legs, current draw per leg, and maximum and typical site power consumption
- Major VMS schematics, including AC power distribution inside and outside the VMS, DC power distribution within the VMS, and control signal distribution inside and outside the VMS.
- Drawings of major VMS components, including LED display modules, driver boards, control/logic components, environmental control assemblies, VMS controller, control equipment cabinet assembly, and control cabinet mounting footprint.
- Catalog cut sheets for major VMS components, including front face paint material, polycarbonate face material, LEDs, regulated DC power supplies, circuit board conformal coating material, hookup wire, signal cable, surge suppression devices, load center, circuit breakers, utility outlets, VMS controller, ventilation/cooling fans, heaters, ventilation filter, thermostats, and any other major system components.
- Test reports and certification for all items identified in the "Product Testing" where? specifications herein
- VMS control software operator's manual
- Certificate of NTCIP compliance

VMS MANUFACTURER QUALIFICATIONS

This section describes the minimum qualifications required for a VMS manufacturer. A VMS manufacturer must meet these minimum qualifications prior to bidding. This section also details the product documentation that must be provided by the Contractor.

The VMS manufacturer for this contract shall:

- Have been in the business, under the same corporate name, of manufacturing large, outdoor, permanently mounted, LED VMS that are used to manage vehicular roadway traffic, for a minimum of ten years prior to the contract bid date. An LED VMS is defined as containing display pixels constructed solely of high-intensity, discrete LEDs.

- Have in operation a minimum of one hundred large, outdoor, permanently-mounted, LED VMS as defined above. Each of these VMS shall have been successfully operated for a minimum period of one year prior to the contract bid date.
- Have in operation, as of the contract bid date, a minimum of ten independently owned and operated VMS systems. Each of these systems shall contain a minimum of ten permanently mounted VMS that use the NTCIP as their primary communications protocol. Each of the VMSs shall be communicating over dial-up telephone, cellular telephone, spread spectrum radio, or fiber optic networks.
- Have previously demonstrated that their VMS controller is NTCIP compliant via compliance testing performed by an independent, third-party testing organization. The testing shall have been completed using industry accepted test tools such as the NTCIP Exerciser, Trevilon's NTester, Intelligent Devices' Device Tester, and/or Frontline's FTS for NTCIP.
- Utilize a documented, in-house, quality management system that has been in place for no less than two years prior to the contract bid date.
- Utilize a documented, certified, welding procedure. All welding shall be by an inert gas process in accordance with the AWS Standards, 2003 ANSI/AWS D1.2/D1.2M Structural Welding Code for Aluminum. The welders and welding procedures shall be certified by an ANSI/AWS Certified Welding Inspector to the above code. Proof of certification of all welders and applicable welding procedures shall be supplied with the submittals. The name, phone number and address of the ANSI/AWS Certified Welding Inspector who certified the welders and procedures shall also be provided with the submittals.

MATERIALS

This section describes the specifications for a full matrix, full-colored, aluminum, front access, VMS capable of displaying multiple lines of text with multiple characters per line.

The VMS shall be Daktronics VF-2420-96x208 20 RGB (30 degree angle).
The following specifications describe major VMS system components required, including:

- Full Matrix, Front access VMS
- VMS controller
- VMS controller enclosure
- VMS control software
- NTCIP communications protocol
- VMS manufacturer qualifications
- Product testing
- Product documentation

The VMS specification describes attributes common to all sizes of 18-inch, full matrix, front access VMS. For features and data that are unique to different VMS sizes, please refer to Table 1. This information can be inserted into the specification using the reference letters provided (A, B, C, etc.):

Table 1: VMS Dimensions

Pixel Rows {A}	Pixel Columns {B}	Cabinet Height {C}	Cabinet Width {D}	Cabinet Depth {E}	Weight Range (lbs) {F}
96	208	7'10"	14'6"	1' 4"	1240

MATERIAL, MANUFACTURING, AND DESIGN STANDARDS

VMS provided for this contract shall comply with the following standards. If no revision date is specified, the most recent revision of the standard applies:

- General VMS Requirements – The VMS shall be designed in accordance with *NEMA Standards Publication TS 4, Hardware Standards for Dynamic Message Signs (VMS), with NTCIP Requirements.*
- Aluminum Welding – The VMS housing shall be designed, fabricated, welded, and inspected in accordance with *ANSI/AWS D1.2-97 Structural Welding Code-Aluminum (1997).*
- Electrical Components – High-voltage components and circuits (120 VAC and greater) shall be designed, wired, and color-coded per the NEC.
- Protection from Environment – The VMS housing shall be designed to comply with type 3R enclosure criteria as described in *NEMA Standards Publication 250-2003, Enclosures for Electrical Equipment (1000 Volts Maximum)*
- Product Electrical Safety - All VMS, associated equipment, and enclosures shall be listed by UL or an accredited third party testing organization, such as ETL Semko, and shall bear the organization's mark. VMS shall be listed as conformant to UL 48 Standard for Electric Signs and UL 50 Enclosures for Electrical Equipment. Control equipment and enclosures shall be listed as conformant to UL 1433 Standard for Control Centers for Changing Message Type Electric Signs.
- Radio Frequency Emissions – All equipment shall be designed in accordance with Federal Communications Commission (FCC) Part 15, Subpart B as a "Class A" digital device.
- Maintenance Access and Safety – The VMS equipment provided shall be compliant with all relevant OSHA requirements.
- Structural Integrity – The VMS housing shall be designed and constructed to comply with all applicable sections of *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, Fourth Edition, 2001,* and the fatigue resistance requirements of *NCHRP Report 412, Fatigue-Resistant Design of Cantilevered Signal, Sign, and Light Supports.*
- Communication Protocols – The VMS controller hardware/firmware and VMS control software shall conform to the applicable NTCIP standards. Refer to the NTCIP section of this specification for detailed NTCIP requirements for this contract.

VMS CONSTRUCTION AND OPERATION

This section describes the minimum construction and operational requirements for the VMS to be supplied under this contract. The contractor shall provide all the materials, software, and services necessary to install VMS and associated equipment that fully

comply with the functional requirements specified herein, including incidental items that may have been inadvertently omitted.

GENERAL

The VMS housing shall provide front service access for all LED display modules, electronics, environmental control equipment, air filters, wiring, and other internal VMS components.

The VMS shall contain a full display matrix measuring a minimum of [A] rows high by [B] pixel columns wide (see Table 1). The matrix shall display messages that are continuous, uniform, and unbroken in appearance to motorists.

Each display pixel shall be comprised of multiple monochrome amber LEDs. Other pixel technologies, such as fiber optic, flip disk, combination flip disk-fiber optic, combination flip disk-LED, liquid crystal, and incandescent lamp, will not be accepted. The centers of all adjacent pixels shall be spaced 2.6" to 2.75" apart, both vertically and horizontally.

The pixel matrix shall be capable of displaying alphanumeric character fonts measuring a minimum of 18 inches high to a maximum of the display matrix height.

The VMS shall be able to display messages composed of any combination of alphanumeric text, punctuation symbols, and graphic images across multiple frames.

Legibility

VMS messages shall, at a minimum, be legible from 150 ft to 900 ft from the VMS display face under the following conditions:

- When the VMS is mounted so its bottom side is positioned between five feet and 20 feet above a level roadway surface
- Whenever the VMS is displaying 18" high, alphanumeric text
- 24 hours per day and in most normally encountered weather conditions
- During dawn and dusk hours when sunlight is shining directly on the display face or when the sun is directly behind (silhouetting) the VMS
- When viewed by motorists that have 20-20 vision
- A range of 3 to 12 feet above the roadway surface
- Must be 9200 candelas per square meter

Dimensions (See Table 1)

VMS housing dimensions shall not exceed [C] feet high by [D] feet wide. The front-to-back housing depth shall not exceed [E] ft at its widest point, including the rear ventilation hoods. VMS weight shall not exceed [F] pounds.

Power Requirement

VMS shall operate from one of the following power sources:

- 120 VAC, 60Hz single-phase, including neutral and earth ground
- 120/240 VAC, 60Hz single-phase, including neutral and earth ground
- Two legs of 120/208 VAC, 60Hz three-phase, including neutral and earth ground

VMS Construction

The VMS housing shall be constructed to have a neat, professional appearance. The housing shall protect internal components from rain, ice, dust, and corrosion in accordance with NEMA enclosure Type 3R standards, as described in *NEMA Standards Publication 250-2003, Enclosures for Electrical Equipment (1000 Volts Maximum).* The VMS housing bottom shall contain small weep holes for draining any water that may accumulate due to condensation. Weep holes and ventilation/exhaust hoods shall be screened to prevent the entrance of insects and small animals.

External VMS component hardware (nuts, bolts, screws, standoffs, rivets, fasteners, etc.) shall be fabricated from hot dipped or mechanically galvanized steel, stainless steel, aluminum, nylon, or other durable, corrosion-resistant material suitable for roadway signage application.

VMS controller components shall operate in a nominal temperature range of –30ºF to +165ºF and a relative humidity range of 0 to 99%, non-condensing. VMS controller components shall not be damaged by storage at or temporary operational exposure to a temperature range of –40ºF to +185ºF.

Except for the environmental control fans, VMS controller components shall be 100% solid-state.

Electrical components in the VMS controller shall be UL listed and meet all NEC codes applicable to VMS applications.

The presence of ambient radio signals and magnetic or electromagnetic interference, including those from power lines, transformers, and motors, shall not impair the performance of the VMS system. The VMS system shall not radiate electromagnetic signals that adversely affect any other electronic device, including those located in vehicles passing underneath or otherwise near the VMS and its controller.

VMS Housing

The VMS housing shall have a NEMA 3R rating as a minimum. The VMS housing structural frame shall consist of aluminum extrusions made from 6061-T6 and/or 6063-T6 aluminum alloy. All sides of the VMS housing exterior, except the front, shall be covered with 0.125-inch thick aluminum sheets made from 5052-H32 aluminum alloy. This external aluminum skin shall be attached to the structural framework using a proven method of attachment.

VMS housing right, left, and rear walls shall be vertical. The top and bottom sides shall be horizontal.

VMS structural assembly hardware (nuts, bolts, washers, and direct tension indicators) shall be stainless steel or galvanized A325 high-strength steel and shall be appropriately sized for the application.

Welding

The aluminum skin shall be welded to the VMS cabinet frame. All exterior sheet seams shall be continuously seam welded to the VMS frame to form a single structure. Stitch welding shall be used on the interior of the cabinet to attach the aluminum skin sheets to the aluminum extrusion frame. The VMS housing shall be welded and inspected in accordance with the requirements of *ANSI/AWS D1.2-97 Structural Welding Code-Aluminum (1997)*. Compliance with this standard shall include, but shall not be limited to, the following:

- Welding shall be performed according to documented in-house welding procedures
- Personnel who perform welding on the VMS housing shall be certified to *AWS D1.2-97* for all weld types required for housing fabrication
- A CWI shall inspect VMS welding on a daily basis and shall complete written reports that document welding progress, weld integrity, and any corrective action taken. The VMS manufacturer shall archive these reports and make them available for review, upon request of the Engineer

Mounting Brackets

Multiple mounting brackets in the form of I-beam or Z-bar extrusions shall be bolted to the VMS housing exterior rear wall to facilitate attachment of the VMS to the support structure. Mounting brackets shall be:

- Extruded from aluminum alloy number 6061-T6
- Attached to the VMS using stainless steel or mechanically galvanized A325 high-strength steel bolts
- Attached to the VMS using direct tension indicators to verify that mounting hardware is tightened properly
- Attached to the VMS structural frame members, not just the exterior sheet metal
- Installed at the VMS manufacturer's factory
- Installed such that all bracket-to-VMS attachment points are sealed and water-tight
- Designed and fabricated such that the Contractor can drill into them without penetrating the VMS housing and compromising the housing's ability to shed water

The hardware used to attach the mounting brackets (nuts, bolts, washers, and direct tension indicators) to the VMS cabinet shall be stainless steel or galvanized A325 high-strength steel and shall be appropriately sized for the application. This hardware shall be supplied by the VMS manufacturer.

Lifting Hardware

For moving and installation purposes, multiple galvanized steel lifting eyebolts or lifting angles shall be attached to the top of the VMS housing. Eyebolt hardware or angles shall be installed at the VMS factory and attach directly to the VMS housing structural frame. All mounting points for eyebolts or angles shall be sealed to prevent water from entering

the VMS housing. Lifting hardware, as well as the housing frame, shall be designed such that the VMS can be shipped and handled without damage or excessive stress being applied to the housing prior to or during VMS installation on its support structure. Special tools shall not be required. Removal of the eyebolts or angles shall not create holes and no replacement bolts or other hardware shall be necessary to seal the cabinet.

Front Face Construction
The VMS front face shall be constructed with multiple vertically or horizontal rigid panels, each of which supports and protects a full-height section of the LED display matrix. The panels shall be fabricated using aluminum sheeting on the exterior and polycarbonate sheeting on the interior of the panel.

To prevent open doors from blowing in wind, they shall each have a retaining latch mechanism to hold the door open at a 60 to 90- degree angle.

Each door shall form the face panel for a section of the sign. The LED modules shall be mounted to the door and be removable from the door when in the open position. Other sign components, such as power supplies, wiring, etc. shall be located inside the sign cabinet and be accessible through the door opening.
Each door shall contain a minimum of two latches to lock them in the closed position. These latches shall be captive to prevent them from falling off. They shall pull the door tight and compress a gasket located around the perimeter of each door. They shall also be capable of providing leverage to easily release the gasket seal when opening the doors. The gasket shall prevent water from entering the cabinet around the doors.
Front face panels shall provide a high-contrast background for the VMS display matrix. The aluminum mask of each panel shall contain an opening optimizing the contrast ratio for each LED pixel, and shall be finished with a matte-black, licensed-factory-applied, KYNAR 500 Resin, fluoropolymer-based coating system. The face shall be uniform in appearance and completely free from distortion, gouges or any other flaws or defects. A certification shall be provided by the licensed-factory KYNAR 500 coater for all aluminum face materials. Openings shall be large enough to not block any portion of the viewing cones of the LEDs.

Each panel shall have a single polycarbonate sheet attached securely to the inside of the aluminum panel. The polycarbonate sheet shall cover all of the pixel openings. The polycarbonate shall be sealed to prevent water and other elements from entering the VMS. The polycarbonate shall contain UV inhibitors that protect the LED display matrix from the effects of UV light exposure and prevent premature aging of the polycarbonate. Polycarbonate sheets shall have the following characteristics:

- Tensile Strength, Ultimate: 10,000 psi
- Tensile Strength, Yield: 9,300 psi
- Tensile Strain at Break: 125%
- Minimum Tensile Modulus: 330,000 psi
- Minimum Flexural Modulus: 330,000 psi
- Minimum Impact Strength, Izod (1/8", notched): 17 ft-lbs/inch of notch

- Rockwell Hardness: M75, R118
- Heat Deflection Temperature Under Load: 264 psi at 270° F and 66 psi at 288° F
- Coefficient of Thermal Expansion: $3.9X10^{-5}$ in/in/F
- Specific Heat: 0.30 BTU/lb/F
- Initial Light Transmittance: 85% minimum
- Change in Light Transmittance, 3 years exposure in a Southern latitude: 3%
- Change in Yellowness Index, 3 years exposure in a Southern latitude: less than 5%

LED display modules shall mount to the inside of the VMS front face panels. Common hand tools shall be used for removal and replacement.

VMS front face borders (top, bottom, and sides), which surround the front face panels and LED display matrix, shall be coated with semi-gloss black KYNAR 500 resin by a licensed-factory coater to maximize display contrast and legibility.

Wind shall not cause distortion of the VMS front face in a manner that adversely affects LED message legibility.

Exterior Finish
VMS front face panels and front face border pieces shall be coated by a licensed-factory coater with semi-gloss black KYNAR 500 resin or an equivalent brand of oven-fired fluoropolymer coating, which has a minimum outdoor service life of 20 years. All other VMS housing surfaces, including the access doors and VMS mounting brackets, shall be natural mill-finish aluminum.

Service Access
The VMS housing shall provide safe and convenient access to all modular assemblies, components, wiring, and subsystems located within the VMS housing. All internal components and front face panels shall be replaceable by a single technician from inside the VMS enclosure.

Utility Receptacles
The VMS housing shall contain a utility outlet circuit consisting of a minimum of three 15 A NEMA 15-R, 120 VAC duplex outlets, with ground-fault circuit interrupters. One outlet shall be located near each end of VMS housing interior, and the third outlet shall be located near the center of the housing.

LED Display Modules
The VMS shall contain LED display modules that include LED pixel array boards and mounting hardware. These modules shall be mounted adjacently in a two-dimensional array to form a continuous LED pixel matrix. Each LED display module shall be constructed as follows:

- Each LED display module shall consist of one LED pixel board and one LED driver circuit board that can be used for controlling multiple displays. The LED driver circuit board shall be mounted to the back of the LED pixel board using durable non-corrosive hardware. LED driver boards shall be electrically connected via one or more header-type connectors. The header connectors shall be keyed such that the boards cannot be connected incorrectly.
- LED display modules shall be mounted to the rear of the display's front face panels using durable non-corrosive hardware. No tools shall be required for module removal/replacement. The modules shall be mounted such that the LEDs emit light through the face panel's pixel holes and such that the face panel does not block any part of the viewing cone of any of the LEDs.
- LED display module power and signal connections shall be via a quick-disconnect, locking-type connector. Removal of a display module from the VMS, or a pixel board or driver circuit board from its display module, shall not require a soldering operation.
- Removal or failure of any LED module shall not affect the operation of any other LED module or VMS component. Removal of one or more LED modules shall not affect the structural integrity of any part of the VMS.
- LED display modules shall be designed to that it is not possible to mount an LED display module upside-down or in an otherwise incorrect position within the VMS display matrix.
- All LED display modules, LED pixel boards and driver circuit boards shall be identical and interchangeable throughout the VMS.

LED Pixel Boards

Each LED pixel board shall be composed of a printed circuit board to which LED pixels are soldered. The LED pixel boards shall conform to the following specifications:

- LED pixel boards shall be manufactured using a laminated fiberglass printed circuit board.
- Each LED pixel circuit board shall contain a minimum of 45 LED pixels configured in a two dimensional array. The pixel array shall be nine pixels high by five pixels wide.
- The distance from the center of one pixel to the center of all adjacent pixels, both horizontally and vertically, shall be 2.6-inches to 2.75 inches.
- Each pixel shall consist of a minimum of two independent strings of discrete LEDs. All pixels shall contain an equal quantity of LED strings.
- The failure of an LED string or pixel shall not cause the failure of any other LED string or pixel in the VMS.
- Pixels shall contain the quantity of discrete LEDs needed to output a minimum intensity of 40 candelas when operated within the forward current limits. This shall yield an overall minimum luminous intensity for the sign face of 9,200 Cd/m^2.
- Each LED pixel shall not consume more than 1.5 watts.

- All exposed metal on both sides of the LED pixel board, except connector contacts, shall be protected from water and humidity exposure by a thorough application of conformal coating. Bench level repair of individual pixels, including discrete LED replacement and conformal coating repair, shall be possible.
- All LED pixel boards shall be identical and interchangeable throughout the VMS.

Discrete LEDs

VMS pixels shall be constructed with discrete LEDs manufactured by Agilent Technologies or approved equal. Discrete LEDs shall conform to the following specifications:

- LEDs used in VMS shall be from the same manufacturer and of the same part number.
- LEDs shall be non-tinted, non-diffused, high-intensity, solid-state lamps that utilize AlInGaP semiconductor technology.
- LED lenses shall be fabricated from UV light resistant epoxy.
- The LED lens diameter shall be 0.2 inches in a T1-3/4 style LED package.
- LEDs shall emit amber light that has a peak wavelength of 590 ± 5 nm. LEDs shall be obtained from no more than two consecutive color bins. The LED manufacturer shall perform color sorting of the bins.
- All pixels shall have equal color and on-axis intensity. All pixels, including spare parts, shall have equal color and on-axis intensity. The method used to provide the equal color and intensity shall be included in the submittals and approved by the Engineer.
- The various LED color and intensity bins shall be distributed evenly throughout the VMS and shall be consistent from pixel to pixel. Random distribution of the LED bins shall not be accepted.
- LEDs shall have a nominal viewing cone of 30° with a half-power angle of 15° measured from the longitudinal axis of the LED. Viewing cone tolerances shall be as specified in the LED manufacturer's specifications and shall not exceed ± 3°.
- The LEDs shall be driven with a nominal 20 mA current.

LED Driver Circuit Board

An electronic driver circuit board shall be provided for each LED pixel module and shall individually control all pixels on that module. The driver circuit boards shall conform to the following specifications:

- LED driver boards shall be manufactured using a laminated fiberglass printed circuit board.
- All exposed metal on both sides of the LED driver board, except connector contacts, shall be protected from water and humidity exposure by a thorough application of acrylic conformal coating or silicone resin conformal coating.
- Bench level repair of individual components, including conformal coating repair, shall be possible.

- LED driver boards shall be microprocessor-controlled and shall communicate with the VMS controller via a wire or fiber optic communication network using an addressable network protocol. The microprocessor shall process commands from the VMS controller to display data, perform diagnostic tests, and report pixel and diagnostic status.
- Constant current LED driver ICs shall be used to prevent LED forward current from exceeding the maximum discrete LED drive current when a forward voltage is applied.
- LED pixels shall be directly driven using PWM of the drive current to control the display intensity. This LED driver circuitry shall vary the current pulse width to achieve the proper display intensity levels for all ambient light conditions. The drive current pulse shall be modulated at a frequency high enough to provide flicker-free operation and a minimum of 200 brightness levels.
- LED driver boards shall be capable of receiving updated display data at a minimum rate of ten frames per second from the VMS controller.
- LED driver boards shall be capable of receiving multiple power feeds from a minimum of two independent power supplies.
- LED driver boards shall contain a microprocessor-controlled power regulation circuit that controls the voltage applied to the LED strings. The power regulation circuit shall automatically adjust the forward voltage of the LEDs to optimize power consumption efficiency as the temperature changes. Indicator LEDs shall be provided to indicate the status of each power source. The power regulation circuit shall monitor the incoming power supply feeds and automatically select one or more to power the LEDs. If any of the incoming power sources fail, the power system shall automatically switch to one or more of the remaining power sources. The voltage of each power input shall be measured to the nearest tenth of a volt and reported to the VMS controller upon request.
- LED driver boards or shall contain a temperature sensor and shall report the temperature to the VMS controller upon request.
- The LED driver circuitry shall be capable of detecting that individual LED strings or pixels are in an off state and shall report the pixel status to the VMS controller upon request.
- Each LED driver board shall contain a seven segment numeric LED display that indicates the functional status of the driver and pixel boards. At a minimum, it shall indicate error states of the LED pixels and communication network. The indicator shall be positioned such that a maintenance technician can easily view the status code for diagnostic purposes. The status codes shall also be reported to the VMS controller upon request.
- All driver circuit boards shall be identical and interchangeable throughout the VMS.
- Removal or failure of a single driver circuit board shall not affect the performance of any other LED display module in the VMS.

- Individual addressing of each driver circuit shall be configured via the communication wiring harness and connector. No on-board addressing jumpers or switches are allowed.

Regulated DC Power Supplies
Regulated DC power supplies shall be identical and interchangeable throughout the VMS and shall conform to the following specifications:

- Output variance: ± 10%
- Nominal maximum output power rating: 1000 watts
- Operating input voltage range: 90 to 260 VAC minimum
- Operating temperature range: -30ºF to +165ºF minimum
- Maximum output power rating shall be maintained over a minimum temperature range of –30ºF to +140ºF
- Power supply efficiency: 75% to 80% minimum
- Power supply input circuit shall be fused
- Automatic output shut down and restart capability if the power supply overheats or one of the following output faults occurs: over-voltage, short circuit, or over-current
- Power supplies shall be UL listed
- Printed circuit boards shall be protected by an acrylic conformal coating or silicone conformal coating

The LED pixel display modules shall be powered with auto-ranging, regulated, switching, power supplies that convert the incoming AC to DC at a nominal voltage of 12 or 24 volts DC. Power supplies shall be wired in a redundant parallel configuration that uses multiple supplies for the VMS display matrix.

Power supplies within each pair shall be redundant and rated such that if one supply fails, the remaining supply shall be able to operate 100% of the pixels in that display region at 100% brightness when the internal VMS air temperature is +140ºF or less.

The power supplies shall be sufficient to maintain the appropriate LED display intensity throughout the entire operating input voltage range.

The output of each power supply shall be connected to multiple circuits that provide power to the LED modules. Each output circuit shall not exceed 15 A.

Each group of power supplies shall be monitored by a microprocessor-controlled circuit. This circuit shall monitor the voltage of each power supply and the status of each output circuit's fuse. The power supply voltages and fuse states shall be reported via a CAN communication network to the VMS controller upon request.

Environmental Monitoring Systems
The VMS shall include sensors that monitor external light level, internal and external temperature, and internal humidity.

Sensors that measure the outdoor ambient light level and the outdoor ambient temperature at the VMS site shall be mounted in-line with the VMS housing walls. This ambient light and temperature measurement system shall consist of three electronic light sensors.

Two of the light sensors shall be placed such that they measure the ambient light levels striking the front and rear of the VMS. The third light sensor shall be mounted to the floor of the VMS housing and shall face the ground. The VMS controller shall continuously monitor the light sensors and adjust the LED display matrix intensity to a level that displays a legible message on the VMS face.

A minimum of one ambient temperature sensor shall be mounted to either the rear wall or bottom of the VMS housing and shall be placed such that it is never in direct contact with sunlight. The external temperature sensor reading shall be continuously monitored by the VMS controller and shall be reported to the VMS control software upon request.

A minimum of one temperature sensor shall be mounted near the top of the VMS interior. The sensor shall measure the temperature of the air in the cabinet over a minimum range of -40°F to +176°F. The internal temperature sensor output shall be continuously monitored by the VMS controller and shall be reported to the VMS control software upon request.

The VMS shall contain one sensor that measures the relative humidity of the air inside the VMS cabinet. The sensor shall monitor the humidity from 0 to 100%. The humidity sensor output shall be continuously monitored by the VMS controller and shall be reported to the VMS control software upon request.

Interior VMS Environmental Control
The VMS shall contain systems for internal ventilation, face panel fog and frost prevention, and safe over-temperature shutdown.

Housing Ventilation/Exhaust System
The VMS shall contain a ventilation system designed to keep the internal VMS air temperature lower than +140°F when the outdoor ambient temperature is +115°F or less.
One filtered air intake port shall be provided for each exhaust port. Intake ports shall be located on the rear VMS wall. Each intake port shall be covered with a filter that removes airborne particles measuring 500 microns and larger in diameter. Each exhaust port shall be located near the top of the rear VMS wall.

One or more ball bearing-type fans shall be mounted at each intake port. These fans shall create positive pressure inside the VMS cabinet.

Fans and air filters shall be removable and replaceable from inside the VMS housing.

An aluminum hood shall cover each air intake and exhaust port. Openings shall be screened to prevent the entrance of insects and small animals. All intake and exhaust hoods shall be sealed to prevent water from entering the VMS.

A thermostat or multiple temperature sensors shall be used to activate the ventilation system.

A manual override timer switch shall be located inside the access door or centrally located to manually activate the ventilation system. The switch shall be adjustable from zero to four hours.

Front Face Panel Defog/Defrost System
The VMS shall contain a defog/defrost system that automatically warms the VMS front face when the internal VMS relative humidity is near condensation levels. This system shall keep the front face polycarbonate panel free of frost and condensation. The heat generated by the defog/defrost system shall not damage any part of the VMS. A thermostat or temperature sensors shall automatically activate the defog/defrost system.

Over Temperature Safety Shutdown
The VMS shall automatically shut down the LED modules to prevent damaging the LEDs if the measured internal cabinet air temperature exceeds a maximum threshold temperature. The threshold temperature shall be configurable and shall have a default factory setting of 140°F.

VMS Controller Signal Interface
For systems with controllers mounted inside the VMS cabinet, the controller to VMS interface shall use shielded Category 5 copper cable. There shall be an access panel for laptop connections mounted at the base of the truss base or in the nearest cabinet for remote access to the sign controller. If CAT 5 cable is used for connection to the external access panel, there shall be a data surge installed and will be the responsibility of the sign manufacturer. The minimum requirements for the surge device will be stated in this document.

Wiring and Power Distribution
Power and Signal Entrances
Two threaded conduit hubs shall be located on the rear wall of the VMS housing. One hub shall be for incoming AC power and the other shall be for incoming VMS signal cabling or a communications line.

Load Center
The VMS shall contain a power load center and circuit breakers that meet the following minimum requirements:

- Service entrance-rated
- Minimum of 20 circuit breaker mounting positions
- Short circuit rating of 22,000 amps for the main breaker
- Short circuit rating of 10,000 amps for the branch circuit breakers
- UL listed load center and circuit breakers

Internal Wiring
Wiring for the LED display module control, environmental control circuits, and other internal VMS components shall be installed in the VMS housing in a neat and professional manner. Wiring shall not impede the removal of display modules, power supplies, environmental control equipment, or other VMS components. Wires shall not make contact with or bend around sharp metal edges. All wiring shall conform to the NEC.

Earth Grounding
The VMS manufacturer shall provide one lug to be used as an earth ground that is electrically bonded to the VMS housing. The lug shall be installed near the power entrance location on the VMS housing rear wall. The Contractor shall provide the balance of materials and services needed to properly ground the VMS to earth. All earth grounding shall conform to the NEC.

Transient Protection
The VMS controller signal and power inputs shall be protected from electrical spikes and transients as follows:

- Site AC Power - The AC power feed shall be protected at the load center by a parallel-connected surge suppressor rated for a minimum surge of 10 kA.
- Control Equipment AC Power - A series-connected surge suppressor capable of passing 15 amps of current shall protect the VMS controller and other control and communication equipment. This surge suppressor shall conform to the following requirements:
    - Withstand a peak 50,000 ampere surge current for an 8x20 μs wave form
    - Maximum continuous operating current of 15 amps at 120 VAC, 60 Hz
    - Series inductance of 200 micro henrys (nominal)
    - Temperature range of –40ºF to +158°F
    - Approximate dimensions of 3" Wide x 5" Long x 2" High
    - The device shall be UL-1449 listed
    - UL 1449 surge rating of 400 V or less
- Communication Signals- Transient voltage surge suppressors shall protect all communication signals connecting to the control equipment from off-site sources using other cables. Transient voltage surge suppressors shall protect all communication lines used to pass data between the VMS controller and VMS.

PRODUCT TESTING
The VMS manufacturer shall provide documentation indicating that the VMS has been tested to the standards below. It is acceptable for the testing to be performed on scale-sized versions of the actual VMS provided that the test unit is functionally and structurally equivalent to the full size VMS.

Third party test reports shall be submitted for the following:

- *NEMA Standards Publication TS 4, Hardware Standards for Dynamic Message Signs (DMS), with NTCIP Requirements* – Section 2, Environmental Requirements. Test report shall detail results of mechanical vibration and shock, electrical noise and immunity,

temperature, and humidity.

- UL 48 Standard for Electric Signs, UL 50 Enclosures for Electrical Equipment, and UL 1433 Standard for Control Centers for Changing Message Type Electric Signs. The UL report numbers for all VMS and control equipment manufactured by the VMS manufacturer shall be listed by UL or an accredited third party testing organization, such as ETL Semko, and shall bear the organization's mark.
- NTCIP 1201:1996, NTCIP Global Object Definitions (including Amendment 1)
- NTCIP 1203:1997, Object Definitions for Dynamic Message Signs (including Amendment 1)
- NTCIP 2101:2001, Point to Multi-Point Protocol Using RS-232 Subnetwork Profile.
- NTCIP 2103 (Draft v1.13), Point-to-Point Protocol over RS-232 Subnetwork Profile.

The test reports shall include testing of sub-network communications, objects in all mandatory conformance groups, and a subset of the remaining objects as deemed appropriate by the testing organization.

When required by the testing standards, the tests shall be performed by independent third party testing facilities. Certified test reports signed by the testing facility personnel shall be submitted for verification by the Engineer.

VMS HOUSING STRUCTURAL CERTIFICATION

A Registered Professional Engineer shall analyze the VMS structural design and shall certify that the VMS is:

- Engineered to 2001 AASHTO and NCHRP Report 411 specifications for basic wind speeds up to 140 mph and centerline sign heights up to 40 feet.
- Engineered to withstand group loading combinations as outlined in *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, Fourth Draft, 2001* including: VMS weight, repair personnel and equipment, snow (40 psf), ice and wind loads, and shall also meet strength requirements for truck-induced gusts as specified in *NCHRP Report 412*.
- Compliant with the fatigue resistance requirements of *NCHRP Report 412, Fatigue-Resistant Design of Cantilevered Signal, Sign, and Light Supports*.
- Capable of withstanding the temporary effects of being lifted by the lifting eyebolts or lifting angles provided

The Professional Engineer shall analyze the complete VMS structural design. This includes the housing, mounting brackets, lifting eyebolts/angles, and bracket-to-housing mounting hardware (nuts, bolts, washers, direct tension indicators, etc.) provided by the VMS manufacturer. Analysis shall include, but shall not be limited to:

- The quantity and type of mounting brackets to be provided
- The quantity and type of hardware (nuts, bolts, washers) used to attach the mounting brackets to the VMS
- Verification that no problem due to the use of dissimilar metals will exist and/or affect the structural integrity of the VMS-to-bracket attachment points

- A recommendation of the number of attachment points and the attachment locations that the installing contractor should use when mounting the VMS to its support structure
- The quantity and type of lifting eyebolts or lifting angles to be provided

The VMS manufacturer shall include a sealed and signed copy of the Professional Engineer's P.E. certification and all supporting calculations after the submittal is approved by KYTC.

Requirements for VMS Controllers
This section describes the minimum specifications for the VMS controllers to be provided with this contract. Each VMS shall include a VMS controller and associated equipment. The contractor shall provide all the materials, software, and services necessary to install VMS controllers and associated equipment that fully comply with the functional requirements specified herein, including incidental items required for operation that may have been inadvertently omitted.

General Requirements
Each VMS shall be controlled and monitored by an individual VMS controller. One controller shall be provided for each VMS. The VMS controller shall be a stand-alone microprocessor-based system, which does not require continuous communication with VMS control software in order to perform most VMS control functions.

The VMS controller shall meet the following operational requirements:

- Communicate using the NTCIP protocol
- Contain memory for storing changeable and permanent messages, schedules, and other necessary files for controller operation
- Include a front panel user interface with LCD and keypad for direct operation and diagnostics
- Contain a minimum of three NTCIP-compliant RS232 communication ports
- Contain a minimum of one NTCIP-compliant Ethernet port with RJ45 connector
- Contain a built-in Hayes-compatible modem with standard RJ11 connector
- Contain VMS-specific control firmware (embedded software) that monitors all external and internal sensors and communication inputs and controls the display modules as directed by external control software and the front panel interface

NTCIP shall be supported in the VMS controller. External protocol converter or translator devices shall not be allowed

Controller Location
For systems with controllers mounted inside the VMS cabinet, the controller to sign interface shall use shielded Category 5 copper cable. There shall be an access panel for laptop connections mounted at the base of the truss base or in the nearest cabinet for remote access to the sign controller. If CAT 5 cable is used for connection to the external access panel, there shall be a data surge installed and will be the responsibility of the sign manufacturer. The minimum requirements for the surge device will be stated in this

document.

Environmental
The VMS controller shall meet the following requirements defined in *NEMA Standards Publication TS 4, Hardware Standards for Dynamic Message Signs (DMS), with NTCIP Requirements.*

VMS Controller Operational Requirements
This section describes the VMS Controller Operational Requirements
Front Panel User Interface
The VMS controller's front panel shall include a keypad and LCD. These devices shall be used to perform the following functions with the VMS controller and VMS:

- Monitor the current status of the VMS controller, including the status of all sensors and a monochromatic WYSIWYG representation of the message visible on the display face
- Perform diagnostics testing of various system components, including pixels, power systems and sensors
- Activate messages stored in memory
- Configure display parameters, including display size and colors
- Configure communications port settings and NTCIP options

The front panel interface shall also include:

- Power switch to turn the controller on and off
- LED power ON indicator
- Local/Remote switch that places the controller in local mode such that it can be controlled from the front panel interface
- LED to indicate state of the Local/Remote mode switch
- Reset switch to quickly restart the controller
- LED "Active" indicator that blinks when the controller is operating correctly
- LED to indicate when any of the NTCIP communication channels are active

Memory
The VMS controller shall have non-volatile, electronically-changeable memory. This memory shall be flash or battery-backed static RAM ICs that retain the data in memory for a minimum of 30 days following a power loss. This changeable memory shall be used to store messages and schedules. The controller memory shall be capable of storing a minimum of 100 changeable messages in non-volatile RAM.

Internal Clock
The VMS controller shall contain a computer-readable clock that has a battery backup circuit. The battery shall keep the clock operating properly for at least five years without external power, and the clock shall automatically adjust for daylight savings time and leap year using hardware, software, or a combination of both. The clock shall be set electronically by the VMS controller microprocessor and shall be accurate to within one minute per month.

Communications
All remote communication ports shall be NTCIP-compatible as defined in the "Requirements for NTCIP Compatibility" section of these specifications.

Communication Modes
VMS controller shall be capable of receive instructions from and provide information to a computer containing VMS control software using the following communication modes:

- Remotely, via direct or dial-up communications, with a remote computer. The system communications backbone and all field modems and signal converters shall provide the VMS controller with an RS232 signal.
- Locally, via direct connection with a laptop computer that is connected directly to the VMS controller using an RS232 null modem connection.

Serial Communication Ports
The VMS controller shall contain a minimum of three NTCIP-compatible RS232 communication ports. These ports shall support multiple communication interfaces, including, but not limited to, direct null-modem (for local laptop control), dial-up and leased-line modems, radio systems, cellular modems, and fiber optic modems. The RS232 ports shall all have standard DB9M connectors.

The baud rate, connection type, and NTCIP communication protocol shall be configurable. Each port shall support all standard serial baud rates ranging from 1200 to 115,200 baud. Each port shall be capable of supporting either NTCIP 2101 (PMPP) or NTCIP 2103 (PPP) sub network profiles. Each port shall also be capable of supporting either NTCIP 2201 (Null) or NTCIP 2202 (Internet) transport profiles. Only one each of the transport and sub network profiles shall be active at any time on a port.

Ethernet Port
The VMS controller shall contain a minimum of one 10/100Base-T Ethernet communication port. This port shall be available for optional use for communicating from the central control system to the VMS controller when an Ethernet network is available. The Ethernet port shall have a standard RJ45 connector.

Communications via the Ethernet port shall be NTCIP-compatible using the NTCIP 2202 Internet transport profile and the NTCIP 2104 Ethernet sub network profile. This shall permit the controller to be operated on any typical Ethernet network using TCP/IP and UDP/IP.

Dial-Up Modem Communication Port
The VMS controller shall include one dial-up modem. The modem port shall have a standard RJ11 connector.

The modem shall be capable of supporting either NTCIP 2101 (PMPP) or NTCIP 2103 (PPP) sub network profiles. The modem port shall also be capable of supporting either

NTCIP 2201 (Null) or NTCIP 2202 (Internet) transport profiles. Only one each of the transport and sub network profiles shall be active at any time on the port.

The modem shall be configurable to support both incoming and outgoing calls as supported by NTCIP. The modem shall support a minimum communication speed range from 1200 baud to 28,800 baud. The modem shall support the following protocols at a minimum: AT command set, MNP5, MNP10, and V.42bis.

Controller Addressing
The VMS controller shall use whatever addressing scheme is appropriate for the NTCIP network types used for communications. The controller addressing shall be configurable through the front panel user interface.

NTCIP 2101 (PMPP) networks shall be configured with an address in the range 1 to 255 with a default address of 1. NTCIP 2104 (Ethernet) networks shall use a static IP address. Both the IP address and subnet shall be configurable. NTCIP 2103 (PPP) networks shall not require network addressing.

Transient Protection
The RS232 and Ethernet communication ports in the VMS controller shall be protected with surge protection between each signal line and ground. The telephone communication port shall be protected by a series/parallel two-stage suppression device that protects the modem from over-voltage and over-current conditions.

VMS Control Outputs
The VMS controller shall transmit and receive data packets to and from the VMS via dedicated communication cables. These cables shall be either multi-mode fiber optic cable with ST-style connectors or stranded, twisted pair, optically-coupled, 300 V, shielded cable. This network will communicate with all sensors, drivers, and other devices utilizing a CAN bus network running throughout the VMS.

Data transferred shall include pixel states, sensor values, and I/O readings from various devices, such as door sensors and power supply monitors. Pixel data shall include the information to be displayed on the VMS face as well as diagnostic data retrieved from the LED drivers.

Messaging
The VMS controller shall have the ability to display messages on the VMS display face
Message Presentation on the VMS Display Matrix
The VMS controller shall control the LED drivers such that the appropriate message is displayed on the VMS. At a minimum, the VMS controller shall support the following features

- *Display of alpha numeric characters, including letters, numbers, and punctuation*
- Selection of particular character fonts
- Horizontal alignment of test on the display, including left, center, and right justification

- Vertical alignment of text on the display, including top, middle, and bottom justification
- Adjust the spacing horizontally between characters or vertically between lines of text
- Alternate between pages of a multiple-page message
- Display graphic bitmaps of various sizes ranging from very small to the size of the entire VMS matrix

Message Effects
The VMS shall be capable of displaying messages using the following types of effects:

- Static Message – The selected message is displayed continuously on the VMS face until the VMS controller blanks the VMS or causes the display of another message
- Flashing Message – All or part of a message is displayed and blanked alternately at a rate between 0.1 seconds and 9.9 seconds. The flash rate shall be user programmable in increments of 0.1 seconds
- Scrolling Message – The message moves across the display face from one side to the other. The direction of travel shall be user selectable as either left-to-right or right-to-left with variable display speeds.
- Multiple-Page Message – A message contains up to six different pages of information, with each page filling the entire pixel matrix. Each page's display time shall be user programmable from 0.1 seconds to 25.5 seconds, and adjustable in increments of 0.1 seconds.

Message Activation
Messages shall be capable of being activated on a VMS in three ways:

- Manual – An operator using the front panel LCD/keypad interface or NTCIP-compatible control software manually instructs a particular message to be activated.
- Schedule – The internal time-based scheduler in the VMS shall be capable of being configured to activate messages at programmable times and dates. Prior to activation, these messages and their activation times and dates shall be configured using the control software.
- Events – If configured by the control software, certain events, like a power loss, may trigger the activation of pre-configured messages when they occur.

A displayed message shall remain on the VMS until one of the following occurs:

- The duration of the message expires
- The controller receives a command to change the message
- The controller receives a command to blank the VMS
- The schedule stored in the controller's memory indicates that it is time to activate a different message
- A special event, such as a loss of communication, occurs that is linked to message activation

It shall be possible to confer a "priority" status onto any message, and a command to display a priority message shall cause any non-priority message to be overridden.

Schedule Activation
The VMS controller shall support the activation of messages based on a time/date-based schedule. The format and operation of the message scheduler shall be per the NTCIP 1201 and NTCIP 1203 standards.

Display of Alphanumeric Text
The VMS controller shall support the storage and use of a minimum of 12 fonts with which messages can be formatted and displayed. Each font shall support up to 255 characters. All text font files shall, at a minimum, include the following characters:

- The letters "A" through "Z", in both upper and lower case
- Decimal digits "0" through "9"
- A blank space
- Eight directional arrows
- Punctuation marks, such as: . , ! ? – ‘ ’ “ ” : ;
- Special characters, such as: # & * + / ( ) [ ] < > @

The VMS manufacturer shall equip the VMS controller with the fonts in Table 2 preinstalled. The controller shall support changing or replacing these fonts from the central software using NTCIP.

Table 2: Fonts

Font Name	Character Height	Character Width (avg.)	Variable or Fixed Width	Stroke Width
7x4	7	4	Variable	Single
7x5	7	5	Fixed	Single
7x6	7	6	Variable	Double
Graphic 7	7	N/A	Variable	N/A
8x4	8	4	Variable	Single
8x6	8	6	Variable	Double
9x6	9	6	Variable	Double
11x7	11	7	Fixed	Double
14x8	14	8	Fixed	Double
14x10	14	10	Variable	Triple
16x8	16	8	Variable	Double
16x10	16	10	Variable	Triple

Display of Graphic Images
The VMS control software shall support the inclusion of graphics in messages. If the NTCIP 1203 v2 standard has not reached a "recommended" or "approved" state by the time of contract award, the manufacturer shall support graphics using manufacturer-specific objects and MULTI tags.

If a manufacturer-specific means of supporting graphics is used, the manufacturer shall commit to provide NTCIP 1203 v2 firmware updates at no cost to the cabinet. These updates shall include all current requirements of these specifications and standard graphics support. The updates shall be installed by the vendor no later than six months after the NTCIP 1203 v2 standard reaches the "approved" state.

VMS Intensity Control
The VMS controller shall provide means to change the brightness of the display matrix automatically. This automatic intensity control mode shall monitor the ambient light sensors or photo circuit of the VMS. The control shall have a minimum of 100 intensity levels, which can be communicated to the LED drivers in the VMS.

System Status Monitoring and Diagnostic Testing
The VMS controller shall be capable of monitoring the status of the VMS components and subsystems in real-time and/or manual modes, depending on the component or subsystem. The following sections detail the status and diagnostic information that shall be provided by the controller. The status and diagnostic data shall be available via the front panel LCD screen and shall be transmitted via NTCIP to control software upon request.

Message Display Status
The VMS controller shall be capable of monitoring and displaying the currently active message (if any) on the controller's front panel LCD display. This display shall be in a WYSIWYG format.

LED Pixel Testing
Upon command from either the front panel control interface or via NTCIP using remote software, the VMS controller shall direct all of the LED modules to perform diagnostic tests of all their pixels. The controller shall then collect and report the results of the pixel testing.

The VMS controller shall be capable of real-time, automatic detection of the on/off status of each of the display's pixels and reporting of such information as required. This monitoring shall take place without interfering with the display on the VMS face.

Power Supply Operation
The VMS controller shall be capable of full time monitoring and have the ability to report the voltage (to the nearest tenth of a volt) of each regulated DC power supplies located in the VMS by monitoring diagnostic outputs located on the supplies.

Door States
The VMS controller shall monitor and report the open/closed status of each of the VMS housing's doors (if equipped with door sensors). If a control equipment cabinet is present and is equipped with door sensors, the VMS controller shall also monitor the status of the control cabinet door(s).

Environmental Conditions
The VMS controller shall be capable of monitor and reporting the readings of constantly? All light, temperature, and humidity sensors installed in the VMS housing.

Error Notification
The VMS controller shall be capable of automatically informing a maintenance operator (via the local LCD panel) and a central control system (via NTCIP communication) of the occurrence of events and subsystem failures.

All component and subsystem errors shall be indicated on the controller's LCD front panel.

The VMS controller shall be capable of sending event notifications to the central control system via SNMP traps as allowed by NTCIP. When an event occurs, the VMS controller shall create a data packet for transmission to the central controller that contains details about the event. The transmission of traps shall be governed by the NTCIP standards. The controller shall be configurable to enable or disable the transmission of traps for each event or error type. This configuration shall include the automatic initiation of these traps, including establishing communications if appropriate, when the NTCIP network permits transmission initiation by the VMS controller.

Error Reporting
The following sections list errors and events that the controller shall report as defined above.

- Over Temperature Shutdown - The VMS controller shall continuously monitor the VMS housing's temperature sensors and shall automatically shut down the VMS if the internal cabinet temperature exceeds a safety threshold. This threshold shall have a default value of +140ºF and shall be configurable at the controller. If the temperature exceeds that threshold, the controller shall trigger a warning notification event. This event shall completely turn it off the LEDs.
- Controller Restart - When the VMS controller detects that it has been restarted due to a manual reset or error condition, it shall send a trap notification to the central system. It shall also automatically activate the NTCIP reset message if it is configured to do so.
- Power Loss - When the VMS controller detects that it has lost power, it shall automatically be indicated on the front panel LCD. If configured to do so, it shall send a trap notification to the central system and activate the NTCIP power loss message.
- Power System Failure - The VMS controller shall automatically monitor the power systems in the VMS and detect any failures. Any failures shall be reported on the front panel LCD and transmitted to the central system in the form of a trap.

- Door Opened - When the VMS controller detects that one of the VMS cabinet or control cabinet doors has been opened, it shall transmit a trap to the central system indicating which door has opened.
- Communication Loss - The VMS controller shall monitor the frequency of communication packets from the central system. If the controller detects that communication has not occurred between the controller and central system for longer than a user configured amount of time, the VMS controller shall automatically activate a communication loss message as defined by NTCIP. This communication loss message shall be configurable and may be disabled as allowed by NTCIP. A trap shall be sent to the central system.

Requirements for VMS Control Software

This section describes the minimum specifications for the VMS control software. The contractor shall provide all software, software media, licenses, and documentation necessary to install and operate a VMS control system that fully complies with the functional requirements herein, including incidental items required for operation that may have been inadvertently omitted.

General Specifications

VMS control software shall, at a minimum, comply with the following:

- Operate on desktop and laptop computers with Intel Pentium III or better processors and Microsoft Windows NT 4.0, 2000 Professional, XP Professional, Windows 7 operating systems
- Provide a user-friendly, multi-color, GUI
- Be written as a native 32-bit Windows program using Microsoft-certified software development tools (compilers, etc.)
- Be capable of controlling a network of at least 250 VMS
- Utilize a client-server architecture with the client connecting to the server via LAN or WAN and the server handling VMS communications
- Support VMS communications via any combination of dedicated hardwired serial network, fiber-optic network, dial-up telephone lines, leased phone lines, cellular telephone, CDPD, spread spectrum radio, Ethernet, or other
- Support VMS control, monitoring, and diagnostic functions
- Control VMS both remotely from a remote location and locally at the VMS site using a laptop computer
- Be accompanied by a software installation utility
- Furnish an operations manual that includes detailed instructions for configuring and using all parts of the software
- Contain an on-line help system that includes documentation for every screen or dialog box present in the software. The software shall also be context sensitive such that pressing the help button or [F1] key on any screen will launch the help page for that particular screen
- Be fully compliant with the communications protocol requirements of the NTCIP Special Provision

Software Security

VMS control software shall support the creation of user IDs and passwords for up to 100 system users. Only a System Administrator shall be permitted to create users and assign user access rights.

Before a system operator can use the VMS control software, the software shall request a username and password. If the correct username and password are not provided, access to the software shall be declined. The software shall lockout a user after failing to log in after a specified number of attempts.

Client-Server Architecture

The software shall be of a modular design including a server and multiple client modules. The server shall control all VMS communication and shall store all data and messages. The client software modules shall be capable of sending requests to and receive responses from the server over any TCP/IP-based network, including LANs and WANs. Separate clients shall be provided for each of the following software functions:

- Shell client that handles user login and logout and launching the other clients
- Display control client for controlling VMS messaging, monitoring system status, and performing VMS diagnostics
- Message editor client for creating and editing VMS messages
- Message scheduler client for creating time and date schedules for activating messages
- Administration client for VMS system configuration and administration

VMS Control

The VMS control software shall provide a user interface that presents the system's VMS status in both list and graphical formats. The software shall allow the VMSs to be grouped as needed by the administrator. The VMS list and map interfaces shall include only the VMSs for the group currently selected.

List and Map Interfaces

The VMS status list shall clearly display the following information about each VMS:

- VMS identification number, as "1" through "250"
- VMS name, in a descriptive text format
- Icon representation of the type of communication network used for the VMS (e.g. direct or dial-up)
- Name and priority level of message file being displayed
- Date and time of last communication between the control software and the VMS controller
- Error and warning status, including pixel errors, power failures, communication errors, etc.
- Configurable bitmaps that may be used to show all or parts of the system geographically
- Icons for each VMS that may be placed anywhere on the map
- Icon color changes to indicate the status of the VMS (i.e., yellow for warnings or red for errors)
- Icon flashes if a message is running on the VMS

- VMS name if mouse is placed over a VMS icon

Direct Control Operations
The user interface shall provide a means for users to directly perform the following tasks for each VMS:

- Send and activate stored messages from the libraries
- Blank the display
- Activate a quick message that is created immediately, not loaded from a library
- Send and activate schedules
- Retrieve both messages and schedules from the VMS
- Perform diagnostics of VMS subsystems such as power supplies, sensors, etc.
- Perform tests of pixels
- Monitoring of the VMS event log

Polling
The software shall have a feature to poll all or a set of VMS at predefined intervals or at a specific time-of-day. During a poll, the software shall retrieve the most recent status information from the VMS and present it to the user as appropriate in the list and map interfaces.

Scenarios
The administrator shall have the ability to create scenarios that act like macros or scripts to automate a series of often repeated tasks. These scenarios shall have the ability to perform the following actions:

- Send and activate stored messages from the libraries
- Blank the display
- Send and activate schedules
- Perform diagnostics of VMS subsystems such as power supplies, sensors, etc.
- Perform tests of pixels

The scenarios shall be saved to libraries where system operators may activate them through the GUI. The scenarios shall also be capable of running automatically at scheduled times if programmed by the user.

System Monitoring
The software shall be capable of monitoring and displaying to the operator the contents of any communications in progress with VMS. The status of all outgoing and incoming data packets shall be displayed.

Multi-Vendor VMS Control
The software shall be capable of controlling any NTCIP-compatible VMS regardless of the manufacturer. The software shall support all mandatory and optional features typical in LED VMS. The software shall be configurable to enable or disable support for any standard optional NTCIP objects.

Message Creation and Editing

A VMS system operator shall be able to use the VMS control software to create, edit, name, and store message files.

Message Editor Defaults
The message editor shall automatically utilize the following default settings during the creation of new message files:

- Pixel spacing between adjacent lines of text
- Pixel spacing between adjacent text characters
- Display duration of a given message page
- Color palette to be used for color-capable VMSs
- Beacon activation status (for VMS that contain flashing beacons)
- Effect to be applied to text (e.g., static, scrolling, etc.)
- Effect rate, which shall determine the speed of scrolling messages
- Flash rate, which shall determine the speed of flashing messages
- Message priority classification
- Horizontal text justification supporting left, center, or right
- Vertical text justification supporting top, middle, and bottom

Message Priorities
User-definable default settings shall allow messages to be assigned a priority classification of:

- Emergency
- High
- Normal
- Low
- Minimal

A numeric priority range shall be assigned to each of these five priority classifications. The priority shall allow two different message files to be assigned the same classification. Within that classification, one message can be identified as having higher priority.

The message editor GUI shall present a scaled image of the VMS display matrix, including a complete and accurate representation of the display matrix type (full or line) and the number of display pixels. The VMS editor image shall actively show message content in a WYSIWYG format, while a new message is being created or an existing message is being edited.

The message editor shall provide the operator with the ability to program:

- The number of pages (one to six)that the message is to contain
- Message text
- Message graphics, including pixel-by-pixel editing, lines, area fill, block move, etc.
- Character font type(s) used to construct the message
- The amount of inter-line spacing, measured in pixels
- Horizontal message justification on the VMS display matrix including left, center,

and right
- Vertical message justification on the VMS display matrix including top, middle, and bottom
- The type of entry effect (static or scrolling)
- Message page on time and off time
- Message scroll rate, if applicable
- The flash rate of all or part of a message page, if applicable
- Message priority status
- The display status of any flashing beacons mounted to the VMS

The message editor shall provide a method of incorporating data fields into a VMS message. The following data fields shall be provided:
- Time, in 12 hour format
- Time, in 24 hour format
- Temperature, in °F and °C
- Vehicle speed, in kph and mph (for VMS sites that contain speed measurement equipment)
- Day of week
- Day of the month
- Month of the year
- Calendar year, in both two-digit and four-digit formats

The message editor shall provide a convenient means for the operator to:
- Insert, add or delete message text
- Paste graphics from other programs using the Windows clipboard
- Clear the contents of the editing page
- Save the message file under its existing name or a new name
- Delete a message file
- Save all changes

It shall be possible to store message files in both the VMS control computer memory and the VMS controller memory.

The system operator shall have the ability to print any message or library of messages.

Message Libraries
VMS control software shall support the creation, editing and storage of message libraries (file directories), which allow the system operator to categorize message files by:
- VMS matrix size
- Message subject matter

The library editor shall allow a system operator to:
- Create a new library
- Store the same message in multiple libraries
- Select a message from an existing library and edit the message contents
- Search libraries for messages with specified text in message name or contents
- Copy/Paste a message from one library to another

- Delete a message file from a library
- Rename a library
- Delete a library
- Save all changes

Schedule Creation and Editing
VMS control software shall support the creation, editing and storage of message schedules, which instruct the VMS controller to run specific messages at pre-determined times and dates.

Software shall contain an editor, which allows messages to be scheduled via:

- Month of the year
- Day of the week
- Day of the month
- Time of day

The schedule editor shall provide a means for the operator to:

- Create a new schedule
- Rename an existing schedule
- Delete a schedule
- Save all change

It shall be possible to store schedule files in both the VMS control computer memory and the VMS controller memory.

Display Fonts
The software shall support a minimum of 12 fonts for each model of VMS. These fonts shall be configurable by the system administrator. The fonts used shall be selectable from a library containing a minimum of 24 fonts provided by the software vendor. Each VMS model shall be capable of using a different set of fonts. The software shall automatically adjust the available fonts in the message editor based on the VMS model configuration.

The software shall include a font editor to allow the operator to create custom fonts. The font editor shall allow the administrator to create new fonts or modify existing fonts. The operator shall have the capabilities to graphically edit each character within a font in a pixel-by-pixel manner.

All fonts provided by the software vendor or created/modified by the administrator shall be downloadable to the VMS.

Event Logging
The software shall include an event logging system that logs all system events. Each logged event shall, at a minimum, include the following:

- Event ID number
- Operator who initiated the event
- Time and date that the event occurred
- Description of the event (e.g., "Diagnostic Test Performed")

- Source of the event (e.g., VMS name)
- Additional data relevant to the event (e.g., "Failed pixel: (4, 73)")

The events logged shall include, but not be limited to, the following:

- User login/logout
- Failed login attempts
- Communication failures
- Message and schedule activation or display blanking
- Diagnostics test results
- Warning events sent from the VMS
- Other system errors

The system operator shall have the ability to view, sort by category, and print the log file at any time.

System Configuration

The VMS control software shall allow users with security access rights to configure system parameters and functions. The basic sets of configurable settings include the following:

- VMS models and individual signs
- Communication networks
- System error/warning alarms
- User security rights
- System maps and VMS icon placement
- Default system options settings
- Default message parameters
- Message priority settings

VMS Configuration

At a minimum, the following information for each VMS shall be configurable in the VMS control software:

- VMS viewing area height and width (for full-matrix VMS)
- Number of lines and each line's height and width (for line-matrix VMS)
- Color capabilities (e.g., amber, tricolor, full-color, etc.)
- Site name
- VMS identification number
- Network address
- Communication parameters

Communication Settings

Communication network control shall include the ability to configure and modify VMS communication networks with the following parameters:

- Network type (e.g., direct serial, dial-up)
- Communication port (e.g. COM4)
- Baud rate (ranging from 1200 to 115,200)

- Hardware handshaking
- NTCIP subnetwork and transport protocols
- Communication retries and timeouts

System Alarms

Configurable settings shall allow the system administrator to determine which of the following events will trigger an audio and/or visual (on-screen) alarm:

- Communication failure
- Priority status conflict
- VMS restart
- Power supply failure
- Door open

User Administration

The administrator shall have the ability to add, remove and modify users and user's access rights? The access rights of each user shall be configurable to allow or deny access to any software feature.

System Maps

It shall be possible to configure each VMS group to appear on a map within the software. The administrator shall be able to use the software to select a map, identified as a bitmap file, which can then be imported into the software. Each VMS shall have an icon that may be placed anywhere on the map.

Software Use and Reproduction Rights

The VMS manufacturer shall provide a VMS control software site license with the VMS supplied for this contract. Ten copies of the VMS control software shall be provided to the engineer on CD-ROM within 30 days of contract award. The Cabinet shall have the right to request or reproduce an unlimited number of software copies for use on the VMS system installed for this contract.

Requirements for NTCIP Conformance

This section describes the minimum specifications for the NTCIP communication capabilities of the VMS controller and VMS control software. The contractor shall provide all software, firmware, and services necessary to operate a VMS system that fully complies with the NTCIP functional requirements, including incidental items required for operation that may have been inadvertently omitted.

References

These specifications reference standards through their NTCIP designated names. Table 3 lists the current version of each of these standards.

Each NTCIP device covered by these project specifications shall implement the version of the applicable standard listed in Table 3. Refer to the NTCIP library at http://www.ntcip.org for information on the current status of NTCIP standards.

Table 3: NTCIP Document References

Document Number	Document Title	Document Status
NTCIP 1101:1996 and Amendment 1	*Simple Transportation Management Framework (STMF)*	Jointly Approved
NTCIP 1102 v1.12	*Octet Encoding Rules (OER) Base Protocol*	Recommended Standard
NTCIP 1103 v1.15	*Transportation Management Protocols*	User Comment Draft
NTCIP 1201:1996 and Amendment 1	*Global Object Definitions*	Jointly Approved
NTCIP 1203:1997 and Amendment 1	*Object Definitions for Dynamic Message Signs*	Jointly Approved
NTCIP 2001:1996 and Amendment 1	*Class B Profile*	Jointly Approved
NTCIP 2101:2001	*Point to Multi Point Protocol (PMPP) Using RS-232 Subnetwork Profile*	Jointly Approved
NTCIP 2103 v1.13	*Point-to-Point Protocol Over RS-232 Subnetwork Profile*	Jointly Approved
NTCIP 2104 v1.10	*Ethernet Subnetwork Profile*	Jointly Approved
NTCIP 2201 v1.14	*Transportation Transport Profile*	Jointly Approved
NTCIP 2202:2001	*Internet (TCP/IP and UDP/IP) Transport Profile*	Jointly Approved
NTCIP 2301:2001	*Simple Transportation Management Framework (STMF) Application Profile*	Jointly Approved

Subnetwork Profiles
Each serial or modem port on each NTCIP device shall be configurable to support both NTCIP 2101 and NTCIP 2103. Only one of these profiles shall be active at any given time. Serial ports shall also support external dial-up modems.

Each Ethernet port on the NTCIP device shall comply with NTCIP 2104.

The NTCIP devices may support additional subnet profiles at the manufacturer's option. At any one time, only one subnet profile shall be active on a given port of the NTCIP device. All response datagram packets shall use the same transport profile used in the request. The NTCIP device shall be configurable to allow a field technician to activate the desired subnet profile and shall provide a visual indication of the currently selected subnet profile.

Transport Profiles
Each serial or modem port on each NTCIP device shall be configurable to support both NTCIP 2201 and NTCIP 2202.

Each Ethernet port on the NTCIP device shall comply with NTCIP 2202.

The NTCIP devices may support additional transport profiles at the manufacturer's option. Each NTCIP device shall support the receipt of datagram's conforming to any of the supported transport profiles at any time. Response datagram packets shall use the same transport profile used in the request.

Application Profiles
Each NTCIP device shall comply with NTCIP 2301 and shall meet the requirements for Conformance Level 1.

An NTCIP device may support additional application profiles at the manufacturer's option. Responses shall use the same application profile used by the request. Each NTCIP device shall support the receipt of application data packets at any time allowed by the subject standards.

Object Support
Each NTCIP device shall support all mandatory objects of all mandatory conformance groups as defined in NTCIP 1201 and NTCIP 1203.

Each NTCIP device shall support all mandatory objects in all optional conformance groups. All optional objects listed shall be supported.

The NTCIP devices shall support the optional conformance groups listed in Table 4.

Table 4: Optional Conformance Groups

Conformance Group	Reference
Time Management	NTCIP 1201
Timebase Event Schedule	NTCIP 1201
Report	NTCIP 1201
PMPP	NTCIP 1201
Font Configuration	NTCIP 1203
VMS Configuration	NTCIP 1203
MULTI Configuration	NTCIP 1203
MULTI Error Configuration	NTCIP 1203
Illumination/Brightness Control	NTCIP 1203
Scheduling	NTCIP 1203
VMS Status	NTCIP 1203
Status Error	NTCIP 1203
Pixel Error Status	NTCIP 1203

Table 5 lists objects that are considered optional in the NTCIP standards, but are required by this specification. Table 5 also indicates modified object value ranges for certain objects.

Each NTCIP device shall provide the FSORS of all objects required by these specifications unless otherwise indicated in Table 5.

Table 5: Modified Object Ranges and Required Optional Objects

Object	Reference	Project Requirement
moduleTable	NTCIP 1201 Clause 2.2.3	Shall contain a minimum of one row with moduleType = 3 (software).
maxTimeBaseScheduleEntries	NTCIP 1201 Clause 2.4.3.1	Shall be a minimum of 28
maxDayPlans	NTCIP 1201 Clause 2.4.4.1	Shall be a minimum of 20
maxDayPlanEvents	NTCIP 1201 Clause 2.4.4.2	Shall be a minimum of 12
maxEventLogConfig	NTCIP 1201 Clause 2.5.1	Shall be a minimum of 50
eventConfigMode	NTCIP 1201 Clause 2.4.3.1	NTCIP Component shall support the onChange, greaterThanValue, and smallerThanValue event configurations
eventConfigLogOID	NTCIP 1201 Clause 2.5.2.7	FSORS
eventConfigAction	NTCIP 1201 Clause 2.5.2.8	FSORS
maxEventLogSize	NTCIP 1201 Clause 2.5.3	Shall be a minimum of 200
maxEventClasses	NTCIP 1201 Clause 2.5.5	Shall be a minimum of 16
eventClassDescription	NTCIP 1201 Clause 2.5.6.4	FSORS
maxGroupAddresses	NTCIP 1201 Clause 2.7.1	Shall be a minimum of 1
communityNamesMax	NTCIP 1201 Clause 2.8.2	Shall be a minimum of 3
NumFonts	NTCIP 1203 Clause 2.4.1.1.1.1	Shall be a minimum of 8
MaxFontCharacters	NTCIP 1203 Clause 2.4.1.1.3	Shall be a minimum of 255
defaultFlashOn	NTCIP 1203 Clause 2.5.1.1.1.3	VMS shall support the full range of these objects with step sizes between 0.1 and 0.5 seconds
defaultFlashOff	NTCIP 1203 Clause 2.5.1.1.1.4	VMS shall support the full range of these objects with step sizes between 0.1 and 0.5 seconds
defaultBackgroundColor	NTCIP 1203 Clause 2.5.1.1.1.1	VMS shall support the black background color
defaultForegroundColor	NTCIP 1203 Clause 2.5.1.1.2	VMS shall support the amber foreground color
defaultJustificationLine	NTCIP 1203 Clause 2.5.1.1.1.6	VMS shall support left, center, and right line justification
defaultJustificationPage	NTCIP 1203 Clause 2.5.1.1.1.7	VMS shall support top, middle, and bottom page justification
defaultPageOnTime	NTCIP 1203 Clause 2.5.1.1.1.8	VMS shall support the full range of this object with step sizes no larger than 0.5 seconds
defaultPageOffTime	NTCIP 1203 Clause 2.5.1.1.1.9	VMS shall support the full range of this object with step sizes no larger than 0.5 seconds
defaultCharacterSet	NTCIP 1203 Clause 2.5.1.1.1.10	VMS shall support the eight bit character set
dmsMaxChangeableMsg	NTCIP 1203 Clause 2.6.1.1.1.4	Shall be a minimum of 100

Object	Reference	Project Requirement
dmsMessageMultiString	NTCIP 1203 Clause 2.6.1.1.1.8.3	VMS shall support any valid MULTI string containing any subset of the MULTI tags listed in Table 6
dmsControlMode	NTCIP 1203 Clause 2.7.1.1.1.1	Shall support, at a minimum, the following modes: local, central, and centralOverride
dmsSWReset	NTCIP 1203 Clause 2.7.1.1.1.2	FSORS
dmsMessageTimeRemaining	NTCIP 1203 Clause 2.7.1.1.1.4	FSORS
dmsShortPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.8	FSORS
dmsLongPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.19	FSORS
dmsShortPowerLossTime	NTCIP 1203 Clause 2.7.1.1.1.10	FSORS
dmsResetMessage	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsCommunicationsLossMessage	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsTimeCommLoss	NTCIP 1203 Clause 2.7.1.1.1.12	FSORS
dmsEndDurationMessage	NTCIP 1203 Clause 2.7.1.1.1.15	FSORS
dmsMemoryMgmt	NTCIP 1203 Clause 2.7.1.1.1.16	VMS shall support the normal and clearChangeableMessages memory management modes
dmsMultiOtherErrorDescription	NTCIP 1203 Clause 2.4.1.1.1.20	If the vendor implements any vendor-specific MULTI tags, the VMS shall provide meaningful error messages within this object whenever one of these tags generates an error
dmsIllumControl	NTCIP 1203 Clause 2.8.1.1.1.1	VMS shall support photocell and manual illumination control modes
dmsIllumNumBrightLevels	NTCIP 1203 Clause 2.8.1.1.1.4	Shall be a minimum of 255
dmsIllumLightOutputStatus	NTCIP 1203 Clause 2.8.1.1.1.9	FSORS
numActionTableEntries	NTCIP 1203 Clause 2.9.1.1.1	Shall be a minimum of 200
watcdogFailureCount	NTCIP 1203 Clause 2.11.1.1.1.5	FSORS
dmsStatDoorOpen	NTCIP 1203 Clause 2.11.1.1.1.6	FSORS
fanFailures	NTCIP 1203 Clause 2.11.2.1.1.8	FSORS
fanTestActivation	NTCIP 1203 Clause 2.11.2.1.1.9	FSORS
tempMinCtrlCabinet	NTCIP 1203 Clause 2.11.4.1.1.1	FSORS
tempMaxCtrlCabinet	NTCIP 1203 Clause 2.11.4.1.1.2	FSORS
tempMinSignHousing	NTCIP 1203 Clause 2.11.4.1.1.5	FSORS
tempMaxSignHousing	NTCIP 1203 Clause 2.11.4.1.1.6	FSORS

MULTI Tags

Each NTCIP device shall support the message formatting MULTI tags in Table 6. The manufacturer may choose to support additional standard or manufacturer-specific MULTI tags.

Table 6: Required MULTI Tags

MULTI Tag	Description
F1	Field 1 time (12 hr)
F2	Field 1 time (24 hr)

MULTI Tag	Description
F8	Field 8 day of month
F9	Field 9 month
F10	Field 10 2 digit year
F11	Field 11 4 digit year
Fl (and /fl)	Flashing text on a line-by-line basis with flash rates controllable in 0.1 second increments.
Fo	Font
Jl2	Line Justification – Left
Jl3	Line Justification – Center
Jl4	Line Justification – Right
JP2	Page Justification – Top
JP3	Page Justification – Middle
JP4	Page Justification – Bottom
Mv	Moving text
Nl	New line
np	New page up to at least 5 instances in a message (i.e. up to at least 1 to 6 pages/frame in a message counting first page)
Pt	Page times controllable in 0.1-second increments

DOCUMENTATION
NTCIP documentation shall be provided on CD-ROM and contain ASCII versions of the following MIB files in ASN.1 format:

- The version of each official standard MIB module referenced by the device.
- If the device does not support the full range of any given object within a standard MIB module, a manufacturer-specific version of the official standard MIB module with the supported range indicated in ASN.1 format in the SYNTAX and/or DESCRIPTION fields of the associated OBJECT TYPE macro. The filename of this file shall be identical to the standard MIB Module except that it shall have the extension "man".
- An MIB module in ASN.1 format containing any and all manufacturer specific objects supported by the device with accurate and meaningful DESCRIPTION fields and supported ranges indicated in the SYNTAX field of the OBJECT-TYPE macros.
- An MIB containing any other objects supported by the device

ACCEPTANCE TESTING
The manufacturer shall provide certification of NTCIP-compliance as part of the pre-build submittal documentation. This certification shall be in the form of a comprehensive test plan and completed test report as performed by either the ITS integrator or a third-party testing agency. The testing shall have been completed using industry accepted test tools such as the NTCIP Exerciser, Trevilon's NTester, Intelligent Devices' Device Tester, and/or Frontline's

FTS for NTCIP. Data capture files from the FTS software during the performance of the above testing shall be furnished upon request of the Engineer.

The Engineer may perform additional NTCIP testing if desired. This testing shall be conducted on a production VMS in the manufacturer's facility during the factory acceptance test. The manufacturer shall provide a written NTCIP test procedure to the Engineer a minimum of 30 days prior to the NTCIP testing.

This item includes conduit and wiring on supporting structure. This item includes all costs for the manufacturer field engineer to perform on-site testing and setup. This item includes all costs for engineering analysis required in the VMS specifications.

INTERPRETATION RESOLUTION
If the Engineer or VMS manufacturer discovers an ambiguous statement in the standards referenced by this procurement specification, the issue shall be submitted to the NTCIP VMS Working Group for resolution. If the Working Group fails to respond within 90 days, the Engineer shall provide an interpretation of the specification for use on the project.

WARRANTY
The manufacturer shall supply at least a five year warranty of all components involved with the operations of the VMS sign. This shall include any tech support, replacement parts and shipping of replacement parts. All warranties shall be transferable and shall start when the VMS Sign is commissioned on site by the manufacturer.

INSTALLATION
VMS shall be installed in accordance with the sign and sign post manufacturers' specifications. The Contractor shall coordinate with the sign and sign post manufacturers to resolve mechanical compatibility problems prior to fabrication of either item.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT
Variable Message Sign will be measured for payment per unit each. The Department will make payment for complete, functioning, inspected, and accepted quantities. The Department will consider payment as full compensation for all work required under this section.

WIRE AND CABLE

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

MATERIALS
Unless otherwise specified, wire shall be stranded copper type USE-2. This item shall include all connectors, splicing and insulating hardware, ties, tape, labels and incidentals

required for electrical connections. The Contractor shall submit to material testing at the discretion of the Engineer.

INSTALLATION

The Contractor shall install all cable or wire runs splice-free from the controller/service location to each cabinet, VMS sign, or camera the cable or wire is feeding. All wire shall be labeled inside cabinets and junction boxes. The contractor shall not use excessive force when pulling wire through duct. The contractor shall replace all wire damaged during installation. The Engineer may require testing of wiring for damaged insulation. Wire that does not pass an insulation resistance test of a minimum of 100 hundred megohms to ground shall be replaced by the Contractor at his cost.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

Vented Rodent Barrier Detail

Vented rodent barrier – Prior to erecting tubular structures and poles on concrete foundations formed with conduit sweeps, a double lapped ring barrier of standard commercial grade 27 gauge hot dipped galvanized 1/8 inch woven wire mesh shall be placed inside the foundations bolt circle. The height of the wire mesh ring barrier shall be from the concrete foundation to the top of the leveling nuts and washers plus 1/4 inch. The Contractor shall take all necessary steps to assure the wire mesh ring will remain in place to eliminate any access through the base plate opening of the tubular structure or pole when erected and plumbed. The Contractor shall not weld or drill to the base plate of the pole. Optional vented rodent barrier designs and materials may be used when approved by the Engineer and at no additional cost to the Department.

Vented Rodent Barrier

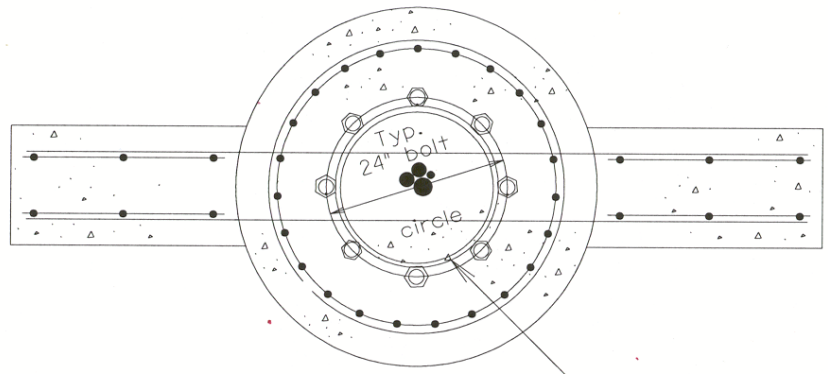
Notes:

1) Wire Mesh Ring
   - 1/8" Woven Hardware Cloth
   - 27 Gauge (Commerical Grade)
   - Hot dipped galvanized
   - Doubled Lapped
   - Length & Height determined by field measurements
   - Secured with Wire Twist Ties

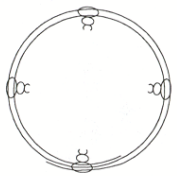
2) Wire mesh ring shall be placed inside the bolt circle before pole is erected and plumbed.

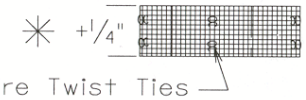
3) Wire mesh ring shall be compressed between pole base plate, concrete foundation and bolt circle. Take all necessary steps to assure the wire mesh ring will remain in place and any access through the pole base plate opening is eliminated.

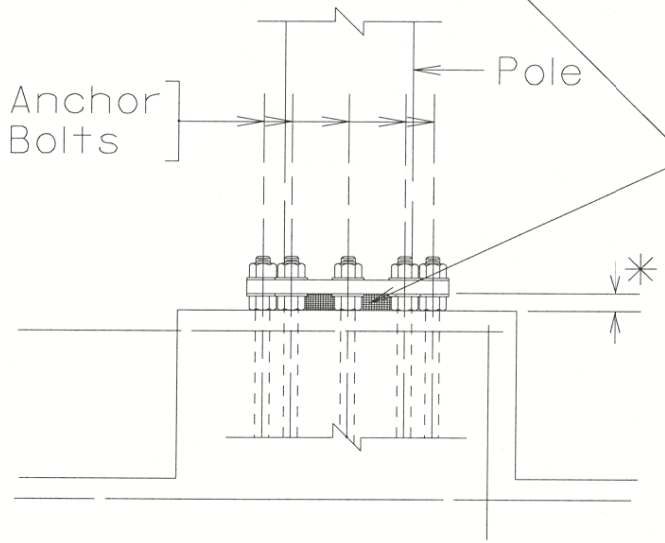
4) Welding or drilling is not permitted on base plate of pole.



DETAIL "A"







SCALE: NONE

Vented Rodent Barrier

...\Spec\CADD\special\RATBAR~1.DGN 04/08/2004 09:52:45 AM

GLOSSARY

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

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

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

- NTSC - National Transmission Standards Committee
- Object – An NTCIP term referring to an element of data in an NTCIP-compatible device that can be manipulated to control or monitor the device.
- OER – Octet Encoding Rules
- OSHA – Occupational Safety and Health Administration
- OTDR – Optical Time Domain Reflectometer
- Page – An NTCIP term referring to the data that is displayed on the VMS display matrix at a given moment in time. Also referred to as a frame.
- P frames – Forward Predicted Frames
- PCB – Printed Circuit Board
- Pixel – Picture element. The smallest changeable (programmable) portion of a VMS display matrix
- PMPP – Point to Multi-Point Protocol
- PPP – Point to Point Protocol
- PSELFEXT – Power Sum Equal Level Far End Cross Talk
- PSNEXT – Power Sum Near End Crosstalk
- PTZ – Pan/Tilt/Zoom
- PVC – Polyvinyl Chloride
- PWM – Pulse Width Modulation
- QSIF – Quarter Source Input Format
- RAM – Random Access Memory
- RARP – Reverse Address Resolution Protocol
- RGB – Red-Green-Blue
- Schedule – A set of data that determines the time and date when a VMS sign controller will cause a stored message to be displayed on the VMS
- SDRAM – Synchronous Dynamic Random Access Memory
- SIF – Source Input Format
- SNMP – Simple Network Management Protocol
- STMP – Simple Transportation Management Framework
- Stroke – Refers to the vertical and horizontal width of the lines and curves of a display font. Single stroke denotes character segments that are one pixel wide. Double stroke denotes character segments that are two pixels wide.
- TFTP – Trivial File Transfer Protocol
- TIA - Telecommunications Industry Association
- TMA – Truck Mounted Attenuator
- TOC – Traffic Operations Center
- UL – Underwriters Laboratories
- UPS – Uninterruptible Power Supply
- USB – Universal Serial Bus
- VLAN – Virtual Local Area Network
- VMS – Variable Message Sign. A type of VMS that is fully programmable such that the content of its messages are fully changeable remotely and electronically.
- VMS Controller – A stand-alone computer that is located at a VMS site, which

controls a single VMS. A sign controller receives commands from and sends information to a control computer

- WAN – Wide Area Network
- WYSIWYG – What You See Is What You Get. More specifically, what you see on the VMS control computer monitor is a scaled representation of how a message will appear when it is being displayed on the VMS. Similarly, after a pixel diagnostic test routine has been run, what you see on the control computer monitor is a scaled representation of the functional status of each pixel in the VMS display matrix.

FIBER OPTIC CABLE AND FIBER TERMINATION RACK

DESCRIPTION

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

MATERIALS

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

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

Fiber optic cable shall be Optical Cable Company BX12 165AD SLX 900 OFNR or approved equal. Fiber optic cable, jumper cables, and distribution equipment shall be fabricated by a certified ISO 9001 manufacturer.

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

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

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

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

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

Optical fibers shall be contained inside a loose buffer tube. Each buffer tube shall contain 12 fibers. The buffer tubes shall allow free movement of the fibers without fiber damage during installation or normal operation, including expansion and contraction of the buffer tubes. The diameter of all buffer tubes in a cable shall match.

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

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

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

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

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

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

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

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

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

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

- Factory order number
- Job number
- Ship date
- Manufacturer's cable code

- Type of cable (single mode, outdoor, indoor)
- Beginning and ending length markings
- Measured length and attenuation

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

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

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

- Have less than 0.2 dB loss when subjected to EIA/TIA-455-1A, 300 cycles, 0.5 kg
- Have an Aramid yarn strength member
- Have a rugged PVC sheathing
- Have a minimum bend radius of 12.5 inches following installation, 25 inches during installation
- Have a minimum tensile strength of 100 lbs
- Have connectors with strain relief pre-wired by the manufacturer
- Comply with NEC requirements for indoor fiber optic cable

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

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

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

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

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

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

INSTALLATION

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

The Contractor shall install fiber optic cable as a continuous run, without splices, between the cable ends identified. The Contractor shall label fiber optic cables at each end of the cable run, at the points where the cable enters and exits the cabinet for mid-cable access locations, and in all junction boxes. Labels for fiber optic cable shall identify the cable number and the string numbers of the fiber contained within the cable.

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

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

Prior to the installation of any fiber optic cable in conduit, the Contractor shall provide the cable manufacturer's recommended and maximum pulling tensions to the Engineer.

Included with these pulling tensions shall be a list of the cable manufacturer's approved pulling lubricants. Lubricants shall be used in quantities and in accordance with the procedures recommended by the lubricant manufacturer.

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

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

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

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

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

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

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

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

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

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

TESTING

Fiber optic cables shall be tested by the manufacturer in conformance with the procedures of TIA/EIA-526-7A. Submittal of test data shall include a summary sheet that clearly illustrates measured loss versus budgeted loss. Each test result on the summary sheet shall be identified by cable number(s) and begin and end locations. The

Contractor shall identify any unacceptable losses and perform corrective work at no additional cost. The maximum permissible loss for cables other than jumpers, terminations, and connector modules is 0.05 dB. Any cable not compliant shall be replaced in its entirely and re-tested for compliance. A copy of the final, summarized, post-installation test results shall be placed in a protective sleeve approved by the Engineer and attached to the rack or door.

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

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

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAFFIC MANAGEMENT PLAN

County: Pulaksi Item No.: 08-0059.25

Federal Project No.: FD52 100-0461-000-004, NHPP 4611-009

Project Description:

:Improve KY 461 from KY 80 to Buck Creek including Interchange

Roadway Classification: ☐ Urban ☒ Rural

☐ Local ☐ Collector ☒ Arterial ☐ Interstate

ADT (current) 19,159 AM Peak Current 1200 PM Peak Current 1900 % Trucks 17.3

Project Designation: ☒ Significant ☐ Other: _____

Traffic Control Plan Design:

Taper and Diversion Design Speeds 45mph

Minimum Lane Width 10ft Minimum Shoulder Width 2ft

Minimum Bridge Width 28ft

Minimum Radius 3,270ft Maximum Grade 4.6%

Minimum Taper Length 45:1 Minimum Intersection Level of Service N/A

Existing Traffic Queue Lengths N/A Projected Traffic Queue Lengths N/A

Comments:

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAFFIC MANAGEMENT PLAN

Item No. 08-0059.25

Discussion:

1) Public Information Plan	
a) Prepare with assistance from ☒ KYTC or ☐ _____	
b) Identify Trip Generators — Referenced	f) Railroad Involvement — N/A
c) Identify Types of Road Users — Referenced	g) Address Pedestrians, Bikes Mass Transit — N/A
d) Public Information Message — Referenced	h) Address Timing, Frequency, Updates, Effectiveness of Plan — Referenced
e) Public Information Strategies to be used — Referenced	i) Police & Other Emergency Services — Referenced

See Public Information Plan References attached

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAFFIC MANAGEMENT PLAN

Item No. 08-0059.25

2) Temporary Traffic Control Plan (For Each Phase of Construction)
Phase I

Exposure Control Measures		**Positive Protection Measures**	
a) Is Road Closure Allowed Type:	Referenced	a) Address Drop Off Protection Criteria	Referenced
b) Detour Conditions	Referenced	b) Temporary Barrier Requirements	Referenced
c) Working Hour Restrictions	Referenced	c) Evaluation of Existing Guardrail Conditions	Referenced
d) Holiday or Special Event Work Restrictions	Referenced	d) Address Temporary Drainage	Referenced
e) Evaluation of Intersection LOS	Referenced	**Uniformed Law Enforcement Officers**	Referenced
f) Evaluation of Queue Lengths	Referenced	**Payment for Traffic Control***	
g) Evaluation of User Costs and Incentives/Disincentives	Referenced	a) Method of Project Bidding	Referenced
h) Address Pedestrians, Bikes, Mass Transit	Referenced	b) Special Notes	Referenced
Work Vehicles and Equipment	Referenced	*Payment for traffic control items shall be in accordance with the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction	

Comments:

See Sheets R143 - R166.

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAFFIC MANAGEMENT PLAN

Item No. 08-0059.25

2) Temporary Traffic Control Plan (For Each Phase of Construction)
Phase 2

Exposure Control Measures		Positive Protection Measures	
a) Is Road Closure Allowed Type:	Referenced	a) Address Drop Off Protection Criteria	Referenced
b) Detour Conditions	Referenced	b) Temporary Barrier Requirements	Referenced
c) Working Hour Restrictions	Referenced	c) Evaluation of Existing Guardrail Conditions	Referenced
d) Holiday or Special Event Work Restrictions	Referenced	d) Address Temporary Drainage	Referenced
e) Evaluation of Intersection LOS	Referenced	**Uniformed Law Enforcement Officers**	Referenced
f) Evaluation of Queue Lengths	Referenced	**Payment for Traffic Control***	
g) Evaluation of User Costs and Incentives/Disincentives	Referenced	a) Method of Project Bidding	Referenced
h) Address Pedestrians, Bikes, Mass Transit	Referenced	b) Special Notes	Referenced
Work Vehicles and Equipment	Referenced	*Payment for traffic control items shall be in accordance with the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction	

Comments:

See Sheets R143-R145, R167-R180.

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAFFIC MANAGEMENT PLAN

Item No. 08-0059.25

2) Temporary Traffic Control Plan (For Each Phase of Construction)
Phase 3

Exposure Control Measures		Positive Protection Measures	
a) Is Road Closure Allowed Type:	Referenced	a) Address Drop Off Protection Criteria	Referenced
b) Detour Conditions	Referenced	b) Temporary Barrier Requirements	Referenced
c) Working Hour Restrictions	Referenced	c) Evaluation of Existing Guardrail Conditions	Referenced
d) Holiday or Special Event Work Restrictions	Referenced	d) Address Temporary Drainage	Referenced
e) Evaluation of Intersection LOS	Referenced	**Uniformed Law Enforcement Officers**	Referenced
f) Evaluation of Queue Lengths	Referenced	**Payment for Traffic Control***	
g) Evaluation of User Costs and Incentives/Disincentives	Referenced	a) Method of Project Bidding	Referenced
h) Address Pedestrians, Bikes, Mass Transit	Referenced	b) Special Notes	Referenced
Work Vehicles and Equipment	Referenced	*Payment for traffic control items shall be in accordance with the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction	

Comments:

See Sheets R143 - R145, R181 - R195.

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAFFIC MANAGEMENT PLAN

Item No. 08-0059.25

2) Temporary Traffic Control Plan (For Each Phase of Construction)
Phase 4

Exposure Control Measures		**Positive Protection Measures**	
a) Is Road Closure Allowed Type:	Referenced	a) Address Drop Off Protection Criteria	Referenced
b) Detour Conditions	Referenced	b) Temporary Barrier Requirements	Referenced
c) Working Hour Restrictions	Referenced	c) Evaluation of Existing Guardrail Conditions	Referenced
d) Holiday or Special Event Work Restrictions	Referenced	d) Address Temporary Drainage	Referenced
e) Evaluation of Intersection LOS	Referenced	**Uniformed Law Enforcement Officers**	Referenced
f) Evaluation of Queue Lengths	Referenced	**Payment for Traffic Control***	
g) Evaluation of User Costs and Incentives/Disincentives	Referenced	a) Method of Project Bidding	Referenced
h) Address Pedestrians, Bikes, Mass Transit	Referenced	b) Special Notes	Referenced
Work Vehicles and Equipment	Referenced	*Payment for traffic control items shall be in accordance with the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction	

Comments:

See Sheets R143-R145, R196-R198.

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAFFIC MANAGEMENT PLAN

Item No. 08-0059.25

2) Temporary Traffic Control Plan (For Each Phase of Construction)
Phase 5

Exposure Control Measures		Positive Protection Measures	
a) Is Road Closure Allowed Type:	Referenced	a) Address Drop Off Protection Criteria	Referenced
b) Detour Conditions	Referenced	b) Temporary Barrier Requirements	Referenced
c) Working Hour Restrictions	Referenced	c) Evaluation of Existing Guardrail Conditions	Referenced
d) Holiday or Special Event Work Restrictions	Referenced	d) Address Temporary Drainage	Referenced
e) Evaluation of Intersection LOS	Referenced	**Uniformed Law Enforcement Officers**	Referenced
f) Evaluation of Queue Lengths	Referenced	**Payment for Traffic Control***	
g) Evaluation of User Costs and Incentives/Disincentives	Referenced	a) Method of Project Bidding	Referenced
h) Address Pedestrians, Bikes, Mass Transit	Referenced	b) Special Notes	Referenced
Work Vehicles and Equipment	Referenced	*Payment for traffic control items shall be in accordance with the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction	

Comments:

See Sheets R143-R145.
Final Surfacing, Pavement Markings, Permanent Signs and Project Clean Up Under Traffic.

Page 8 of 8

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAFFIC MANAGEMENT PLAN

Item No. 08-0059.25

APPROVAL:

Joe Bossarge — 8/21/2020
Project Manager — Date

William Lucas — 8/26/2020
Project Delivery and Preservation Manager — Date

Conley Mo — 8-27-20
Engineering Support Manager — Date

EILEEN JOHANNEMAN VAUGHAN
Digitally signed by EILEEN JOHANNEMAN VAUGHAN
Date: 2020.09.03 09:52:45 -04'00'
FHWA Representative — Date

Revisions to the TMP require review/approval by the signatories.

TRAFFIC MANAGEMENT PLAN

ITEM NO. 08-0059.25

PUBLIC INFORMATION PLAN REFERENCES

B. TRIP GENERATORS

Valley Oak Industrial Complex and other businesses along KY 461 / KY 80 Corridor

Residences and agricultural sites within the project limits

Tourism Access to Lake Cumberland

Through traffic linking the Cumberland Parkway to I-75

C. IDENTIFY TYPES OF ROAD USERS

Industrial and commercial traffic.

Commuters

Residents

Tourism

STAKEHOLDERS

- Utility Companies
  - Southeastern Water Association: 606-678-5501
  - City of Somerset Water/Wastewater Division: 606-425-5364
  - City of Somerset Natural Gas: 606-425-5374
  - South Kentucky Rural Electric Cooperative Corporation: 606-678-4121
  - East Kentucky Power: 859-754-9383
  - Spectrum: 866-874-2389
  - Kentucky Data Link (Windstream Enterprise): 606-329-6195
  - Windstream Communications: 859-357-6209
  - Kentucky Wired: 502-782-9549
- Industrial Park
  - Somerset Pulaski Economic Development Authority: 606-425-5408
- Government Agencies / Emergency Response
  - Pulaski County Judge Executive: 606-678-4853
  - Pulaski County Board of Education: 606-679-1123
  - Pulaski County Sheriff: 606-678-5145
  - Pulaski County Emergency Management: 606-679-6388

LOCAL MEDIA OUTLETS

- Commonwealth Journal - 606-678-8191/news@somerset-Kentucky.com
- Clear Channel Radio - 606-678-5151/psa@somersetradio.com
- WTLO Radio - 606-678-8151/grmoore@forchtbroadcasting.com
- WRVK - 606-256-1460/radio@wrvk1460.com
- Mount Vernon Signal - 606-256-2244/mvsignal@windstream.net

D, E, H, I - PUBLIC INFORMATION MESSAGE, STRATEGIES, UPDATES, POLICE AND OTHER EMERGENCY SERVICES

Prior to Construction

- KYTC will issue press releases and social media updates announcing the advertisement for bids and when the project is awarded.
- The contractor will prepare and submit a detailed traffic management plan to the engineer for review and approval at least one month prior to any construction activity beginning. This plan will include, but not be limited to: a public information plan to be implemented before and during construction; maintenance of traffic procedures and signage; flagging and traffic control personnel and equipment; debris clean-up crews and equipment; construction equipment to be used on and around road work; passage or restriction of wide loads; and safety of traffic and construction personnel.
- Initial contact by the awarded contractor will be made to all stakeholders listed previously to inform them of the time the construction will begin, the expected times and dates of roadway and lane closures, any other anticipated impacts to travel and access, and where to find and follow information about the project. This contact is to be made sufficiently ahead of time to allow each stakeholder time to adjust to the changes.
- A public information campaign, communicating by way of local radio, newspaper, TV stations, portable changeable message boards, and the District 8 social media presence on Facebook and Twitter will be made to inform the traveling public at large of the impending construction. The information should include: anticipated lane closures, roadway closures, and the dates and times they are expected. The awarded contractor will initiate the campaign and work through the District Public Information Officers to disseminate information.
- Anticipated times of lane restrictions and total closures should be adjusted, if necessary, to accommodate special needs of the stakeholders or public at large.

During Construction

- The public information campaign will continue, using the same methods as prior to construction. Updates to travel impacts will be made, including those times which no closures are anticipated (such as periods of construction inactivity and holidays).
- The awarded contractor will provide a contact name and number to all identified stakeholders to allow for individual updates and information during regular business hours. A 24-hour, 7-days a week name and number will also be made available for contact in emergency situations.

- The Engineer and contractor will regularly review both the public information campaign and maintenance of traffic plan to ensure the needs and safety of the public are being met. This would include both method and timing of traffic management procedures.
- In addition to the normal placement of signs, variable message boards should be placed well in advance of the project to forewarn long-distance travelers who may not have had advance warning through local media.
- The project maintenance of traffic plan is referenced as well.

KENTUCKY TRANSPORTATION CABINET
Department of Highways
DIVISION OF RIGHT OF WAY & UTILITIES

TC 62-226
Rev. 01/2016
Page 1 of 1

RIGHT OF WAY CERTIFICATION

☒ **Original** ☐ **Re-Certification** — **RIGHT OF WAY CERTIFICATION**

ITEM #	COUNTY	PROJECT # (STATE)	PROJECT # (FEDERAL)
08-59.25	Pulaski	12F0 FD52 67808 13R	NHPP 4611 (009)

PROJECT DESCRIPTION

Improve KY 461 from KY 80 to Buck Creek Bridge, Including Interchange at KY 80.

☐ **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	55	EXCEPTION (S) Parcel #	ANTICIPATED DATE OF POSSESSION WITH EXPLANATION
Number of Parcels That Have Been Acquired			
Signed Deed	51		
Condemnation	4		
Signed ROE	4		

Notes/ Comments (Text is limited. Use additional sheet if necessary.)

Parcel 300-KYTC is in possession of the real estate, the cell tower is still in place. The anticipated date of removal expected on or before 60 days of this certification. The construction proposal will state "no work" on Parcel 300 before 01 January 2021. This will not affect letting or construction of the project.
Parcels 10, 11, 13, 14, 18, 22, 25, 29, 30, 39, 41, 42, & 68 have improvements to be removed. Asbestos inspection has been completed and anticipated asbestos abatement is August 28, 2020. Demolition contract is currently advertised and will be awarded to contractor as soon as possible after abatement. Anticipated date for removal of all improvements is November 30, 2020. This will not affect letting or construction of the project.

LPA RW Project Manager		Right of Way Supervisor	
Printed Name		Printed Name	
Signature		Signature	2020.08.20 13:11:36 -04'00'
Date		Date	

Right of Way Director		FHWA	
Printed Name		Printed Name	
Signature	DM Loy Digitally signed by DM Loy Date: 2020.08.21 10:45:08 -04'00'	Signature	TODD A JETER Digitally signed by TODD A JETER Date: 2020.08.27 10:06:35 -04'00'
Date		Date	

SPECIAL NOTE

For Right of Way

Pulaski County

IMPROVE KY-461 FROM KY-80 TO BUCK CREEK BRIDGE, INCLUDING INTERCHANGE AT KY-80

Item No. 8-59.25/.26

Parcel 300-KYTC is in possession of the real estate, the cell tower is still in place. The anticipated date of removal is expected on or before 60 days of the right of way certification (08/27/2020). There will be no work on Parcel 300 before 01 January 2021 unless the Division of Right of Way certifies that the parcel is clear before 01 January 2021.

UTILITIES AND RAIL CERTIFICATION NOTE

Pulaski County
0NHPP4611009
FD52 100 6780808U
Mile point: 0.000 TO 3.879
IMPROVE KY-461 FROM KY-80 TO BUCK CREEK BRIDGE, INCLUDING INTERCHANGE AT KY-80. (18CCR)
ITEM NUMBER: 08-59.25

PROJECT NOTES ON UTILITIES

For all projects under 2000 Linear feet which require a normal excavation locate request pursuant to KRS 367.4901-4917, the awarded contractor shall field mark the proposed excavation or construction boundaries of the project (also called white lining) using the procedure set forth in KRS 367.4909(9)(k). For all projects over 2000 linear feet, which are defined as a "Large Project" in KRS 367.4903(18), the awarded contractor shall initially mark the first 2000 linear feet minimally of proposed excavation or construction boundaries of the project to be worked using the procedure set forth in KRS 367.4909(9)(k). This temporary field locating of the project excavation boundary shall take place prior to submitting an excavation location request to the underground utility protection Kentucky Contact Center. For large projects, the awarded contractor shall work with the impacted utilities to determine when additional white lining of the remainder of the project site will take place. This provision shall not alter or relieve the awarded contractor from complying with requirements of KRS 367.4905 to 367.4917 in their entirety.

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

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs. The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

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

UTILITIES AND RAIL CERTIFICATION NOTE

Pulaski County
0NHPP4611009
FD52 100 6780808U
Mile point: 0.000 TO 3.879
IMPROVE KY-461 FROM KY-80 TO BUCK CREEK BRIDGE, INCLUDING INTERCHANGE AT KY-80. (18CCR)
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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.

Utility coordination efforts determined that no significant utility relocation work is required to complete the project. Any work pertaining to these utility facilities is defined in the bid package and is to be carried out as instructed by the Kentucky Transportation Cabinet. The contractor will be responsible for any coordination or adjustments that are discussed or quantified in the proposal.

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

Not Applicable

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

THE FOLLOWING FACILITY OWNERS ARE RELOCATING/ADJUSTING THEIR FACILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

East Kentucky Power Cooperative (EKPC) – Electric: Work Completed May 1, 2020

South Kentucky Rural Electric Cooperative Corporation (SKRECC) – Electric: Work in progress, estimated to be complete September 15, 2020.

THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE OWNER OR THEIR SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

AT&T Legacy – Communication

AT&T will be relocating existing buried fiber optic lines located north of, and approximately parallel to, KY 80 temporarily overhead to eliminate conflicts with the road project. This move will be followed in the future by an additional future move to bury these lines after private easements are secured.

Estimated Clearance Date – February 1, 2021

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Spectrum – CATV

Spectrum Communications will be hanging new cable on RECC's new poles. They will remove the existing cable from old poles.

Estimated Clearance Date – January 1, 2021

Windstream – Communications

Windstream Communications will be hanging new fiber and copper communication lines on RECC's new poles. They will remove the existing fiber and copper cables from old poles.

Estimated Clearance Date – January 1, 2021

Kentucky Data Link Group, a Division of Windstream – Communications

Kentucky Data Link Group will be relocating existing fiber communication lines to RECC's new poles.

Estimated Clearance Date – January 1, 2021

Kentucky Communications Network Authority - Kentucky Wired – Communications

Kentucky Wired will be hanging new fiber communication lines on RECC's new poles. They will remove the existing fiber cables from old poles and remove the old poles when the move is complete.

Estimated Clearance Date – January 1, 2021

SPEDA – Private Communications Line – Communications

SPEDA will be hanging new fiber communication lines on RECC's new poles. They will remove the existing fiber cables from old poles and remove the old poles when the move is complete.

Estimated Clearance Date – January 1, 2021

Southeastern Water Association – Water

Southeastern Water Association will be laying new water lines throughout the project. Notice of Award was sent to Weddle Enterprises, Inc. on 8-21-2020.

Estimated Clearance Date – March 1, 2021

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City of Somerset – Water

City of Somerset Water will be laying new water lines from approximate station 180+00 to approximate station 228+00. Notice of Award was sent to Hubert Excavating & Contracting, LLC on 8-19-2020. Somerset Utilities (gas, water, and sewer) are combined in one relocation contract.

Estimated Clearance Date – March 1, 2021

City of Somerset – Sewer

City of Somerset Sewer will be laying new sewer lines from approximate station 180+00 to approximate station 228+00. Notice of Award was sent to Hubert Excavating & Contracting, LLC on 8-19-2020. Somerset Utilities (gas, water, and sewer) are combined in one relocation contract.

Estimated Clearance Date – March 1, 2021

City of Somerset – Natural Gas

City of Somerset gas will be laying new sewer lines from approximate station 180+00 to approximate station 228+00. Notice of Award was sent to Hubert Excavating & Contracting, LLC on 8-19-2020. Somerset Utilities (gas, water, and sewer) are combined in one relocation contract.

Estimated Clearance Date – March 1, 2021

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

Not Applicable

RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

• **No Rail Involvement** • **Rail Involved** • **Rail Adjacent**

UTILITIES AND RAIL CERTIFICATION NOTE

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AREA FACILITY OWNER CONTACT LIST:

Facility Owner	Address	Contact Name	Phone	Email
AT&T Legacy - Communication	7555 East Pleasant Valley Road Independence OH 44131	Mike Diederich	O: (216) 750-0135 M: (216) 212-8556	MD4145@att.com
		Don Garr	M: (502) 741-8374	Dongarr@outlook.com
City of Somerset - Natural Gas	City Hall/Energy Center 306 E. Mt. Vernon St. Somerset Ky 42501	Bruce Neely	O: (606) 425-5374 M: (606) 875-4766	bneely@cityofsomerset.com
City of Somerset - Sewer	City Hall/Energy Center 306 E. Mt. Vernon St. Somerset Ky 42501	Dana Whitis	O: (606) 425-5364 M: (606) 875-8549	dwhitis@cityofsomerset.com
City of Somerset Water Service - Water	City Hall/Energy Center 306 E. Mt. Vernon St. Somerset Ky 42501	Dana Whitis	O: (606) 425-5364 M: (606) 875-8549	dwhitis@cityofsomerset.com
East Kentucky Power Cooperative - Electric	4775 Lexington Road P.O. Box 707 Winchester KY 40392-0707	Lucas Spencer	O: (859) 745-9383 M: (859) 771-5394	Lucas.spencer@ekpc.coop
		Kelsey Meranda	O: (859) 745-9393	kelsey.meranda@ekpc.coop

Form Revised 6/24/16

UTILITIES AND RAIL CERTIFICATION NOTE

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Kentucky Wired - Communication Kentucky Communications Network Authority (KCNA)	Ledcor	Gary Lady	M: (859) 619-9166	Gary.Lady@ledcor.com
	KY Finance Cabinet	Mike Haydon	O: (502) 782-2535	Mike.Hayden@ky.gov
Southeastern Water Association, Inc. - Water	147 E. Somerset Church Road Somerset, KY 42503	Morris Vaughn	O: (606) 678-5501	sewawater@yahoo.com
South Kentucky RECC - Electric	PO Box 910 Somerset KY 42502	Bruce Parkey	P: (800) 264-5112	brucep@skrecc.com
Time Warner Cable / Spectrum Cable - Communication	105 West Third Street Corbin KY 40701	Darrell Nave	O: (606) 425-5885 M: (606) 271-2501	Darrell.Nave@charter.com
Kentucky Data Link, a Division of Windstream Communications (KDL) - Communication	130 West New Circle Road Lexington KY 40505	Mark Ware	M: (606) 329-6195	Mark.Ware@windstream.com
Windstream Communications - Communication	130 West New Circle Road Lexington KY 40505	Steve Johnson	O: (859) 357-6209 M: (859) 321-2035	Steve.Johnson@windstream.com

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SPEDA – Private Communications	306 E. Mt. Vernon St. Suite 316 Somerset, KY. 42501	Chris Girdler	O: (606) 425-5409 M: (859) 321-2035	Chris@speda.org

Form Revised 6/24/16

N O T I C E

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
(LETTER OF PERMISSION & LOP WQC AUTHORIZATION)

PROJECT: Pulaski County, Item No. 8-59.25
KY-80/KY-461 Interchange

The Section 404 & 401 activities for this project have been previously permitted under the authority of the Department of the Army Letter of Permission (LOP) & Division of Water LOP Water Quality Certification. In order for these authorizations to be valid, the attached conditions must be followed. The contractor shall post a copy of this LOP Permit & LOP WQC 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 Corps of Engineers. A copy of any request to the Corps of Engineers 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

May 19, 2020

Regulatory Division
South Branch (RDS)
ID No. LRL-2020-00091

Mr. Roy Collins
Kentucky Transportation Cabinet, DEA
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Collins:

This is in regard to your application for a Department of the Army (DA) permit concerning a proposal to construct a new interchange and widen Kentucky Highway 461 and Kentucky Highway 80 near Somerset in Pulaski County, Kentucky. We have reviewed your application 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. Therefore, you are authorized, in accordance with 33 USC 403, to place fill material into approximately 1,380 linear feet of Big Spring Branch, 1,638 linear feet of Flat Lick Creek, 199 linear feet of an unnamed tributary to Buck Creek and 1,784 linear feet of an unnamed tributary to Flat Lick Creek, respectively, and 2.43 acres of adjacent wetlands. This permission is granted with the following Special Conditions:

1) The project shall be constructed in accordance with plans included in the January 22, 2020, application for the Kentucky Transportation Cabinet, Item No. 8-59.25/.26 and all subsequent information received regarding changes to the original submittal and/or mitigation plan.

2) To compensate for stream and wetland impacts, the permittee shall provide a receipt from an approved mitigation bank within the service area for the purchase of 7,362 stream AMU's and 4.9 wetland AMU's or provide proof of purchase from the Kentucky Department of Fish and Wildlife Resources for 8,834 stream AMU's and 4.9 AMU's of wetland mitigation credit 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 the **31st of May 2025**. If you find 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) The project/permittee action must remain consistent with the processes identified in the

2015 Interim Programmatic Agreement for Forest Dwelling Bats between the Federal Highway Administration (FHWA), the KYTC, and the Service's Kentucky Field Office.

5) The permittee must commit to the minimization measures outlined in the Biological Assessment (Section 6.1) that shall be used to limit the effects to potential foraging and commuting habitat of the Gray Bat (Myotis grisescens).

6) The permittee shall comply with the enclosed transmittal of the General WQC for the Letter of Permission Authorizing Transportation Projects for the Kentucky Transportation Cabinet, dated February 28, 2020.

7) The permittee must agree to comply with the enclosed General Conditions.

8) Upon completion of construction you are to notify the District Engineer. The enclosed Completion Report form must be completed and returned to this office.

This authorization will be effective as soon as we receive your signed acceptance of these conditions. Please sign and date the duplicate copy of this letter in the space provided and return the signed copy in the enclosed envelope. Note that we also perform periodic inspections to ensure compliance with our permit conditions and appropriate Federal laws.

Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

FOR THE DISTRICT ENGINEER:

Justin Branham
Team Leader South Branch
Regulatory Division

Byrd/RDS/KY 461 LOP Ltr.docx
Branham/RDS
RECORD COPY

Enclosures

(I accept the conditions of this authorization):

_____ _____
Kentucky Transportation Cabinet Date

AUTHORIZED AGENT

Mr. Richard Clausen
Redwing Ecological Services, Inc.
1139 South Fourth Street
Louisville, Kentucky 40203

COORDINATING AGENCIES

USEPA, Region IV
WCOB c/o SESD (Room A100-13)
980 College Station Road
Athens, Georgia 30605-2720

U.S. Fish & Wildlife Service
J.C. Watts Federal Building
330 West Broadway, Suite 265
Frankfort, KY 40601

Director
Kentucky Energy & Environment Cabinet
Division of Water
300 Sower Boulevard
Frankfort, KY 40601

Mr. Doug Dawson
Ky. Dept. of Fish and Wildlife Resources
#1 Game Farm Road
Frankfort, KY 40601

Executive Director
State Historic Preservation Officer
Kentucky Heritage Council
The Barstow House
410 High Street, Frankfort, KY 40601

US ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
REGULATORY DIVISION
P. O. BOX 59
LOUISVILLE, KY 40201-0059
(502) 315-6733
COMPLETION REPORT

COE ID No. LRL- **Date.**

Permittee Name:
Corporate Name:
Address:

City **State** **Zip Code**
Telephone No.

Agent Name:
Corporate Name:
Address:

City **State** **Zip Code**
Telephone No.

Location Description:

County **State**

Linear Feet of Stream Impact: **Acres of Wetland Impact:**

Has all the work on this project been completed according to plans, specifications, and conditions of the permit? Yes_____ No_____

If not, explain: _____

_____

_____

_____

_____

_____

_____

_____

_____

Permittee Signature

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.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Kentucky Transportation Cabinet	File Number:LRL-2020-00091	Date: 05/15/2020
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
X	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Crystal Byrd US Army Corps of Engineers – Louisville District 845 Sassafras Creek Road Sassafras, KY 41759 (606) 642-3404	Appeals Officer US Army Corps of Engineers – Great Lakes and Ohio River Div CELRD-CM-O 550 Main Street, Rm 10032 Cincinnati, OH 45201-3222 (513) 684-6212

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

ANDY BESHEAR
GOVERNOR

REBECCA W. GOODMAN
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

ANTHONY R. HATTON
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

February 28, 2020

Mr. Danny Peake
Kentucky Transportation Cabinet (KYTC)
200 Mero St
Frankfort, KY 40622

Re: §401 Water Quality Certification
Letter of Permission No.: WQCLOP2020-012-7
KY 461 - Pulaski Co
KY-80/KY-461 Interchange & Widening
AI No.: 164618; Activity ID: APE20200001
KYTC Item No.: 8-59.25 & 8-59.26
USACE ID No.: LRL-2020-00091-cdb
Big Spring Branch, Flat Lick Creek, UT Flat Lick Creek, & wetlands
Pulaski County, Kentucky

Dear Mr. Peake:

This letter transmits to you a copy of our General Water Quality Certification (WQC) for the Letter of Permission Authorizing Transportation Projects for the Kentucky Transportation Cabinet – KY-80/KY-461 Interchange & Widening in Pulaski County, Kentucky, in accordance with plans included in the "Application for Permit to Construct Across or Along a Stream and/or Water Quality Certification" received January 21, 2020, additional information received February 24, 2020, and the 404/401 Permit Application Addendum received February 25, 2020, including impacts to 916 linear feet of ephemeral stream, 1,067 linear feet of intermittent stream, 3,018 linear feet of perennial stream, and 2.429 acres of wetland.

KYTC shall notify the WQC Project Manager or Supervisor of the scheduled start of construction activities at least two weeks before the start of construction and upon the substantial completion of construction no later than two week post-construction. Compensatory mitigation will be accomplished through purchasing 7,362 stream Adjusted Mitigation Units (AMUs) and 4.9 wetland AMUs through an approved mitigation bank or 8,834 stream AMUs and 5.8 wetland AMUs through the Kentucky Department of Fish and Wildlife Resources (KDFWR) Stream and Wetland Mitigation Fund, a copy of the mitigation receipt shall be submitted to the WQC Project Manager or Supervisor prior to the start of construction. As-built drawings shall be submitted within 90 days after substantial completion of construction. In-stream work shall not be conducted during the fish spawning season, April 15th through June 15th, without prior written approval.

KYTC shall submit annual monitoring report for no less than three years for Big Spring Branch (station 61+50), Flat Lick Creek (station 154+00), and the UT to Flat Lick Creek (station 147+00) beginning with the first full growing season after construction is complete. The reports shall include photos, a narrative describing the stability of the stream, and any maintenance conducted. The reports should be submitted to the WQC Project Manager or Supervisor by December 31 of each monitoring year. KYTC shall request the release from

monitoring. Request must be approved by the WQC Project Manager in order for the site to be released from monitoring requirements.

An individual WQC is not necessary for this activity provided that this project has satisfies the Transportation Letter of Permission from the U.S. Army Corps of Engineers (Letter of Permission for Transportation Projects, Corps ID No. LRL-2006-259, issued October 03, 2007 and revised October 28, 2010) and all conditions of the attached General Water Quality Certification - Letter of Permission Authorizing Transportation Projects are met. If construction does not commence within five years of the date of this letter, this certification will become void. A letter requesting renewal should be submitted to the WQC Project Manager or Supervisor at least one month prior to expiration.

Although an Individual WQC is not needed, other permits from the Division of Water may be required. 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). If the project needs to develop a Groundwater Protection Plan (GPP), impacts a Wellhead Protection Areas (WHPAs) or Sinkhole contact the Watershed Management Brach (502-564-3410).

All future correspondence on this project must reference **AI No. 164618**. Please contact Samantha Vogeler by phone at 502-782-6995 or email at samantha.vogeler@ky.gov if you have any questions.

Sincerely,

Elizabeth M Harrod, Supervisor
Water Quality Certification Section
Kentucky Division of Water

EH:SV
Attachment

cc: Roy Collins, KYTC: Frankfort (via email: RoyC.Collins@ky.gov)
Andrew Logsdon, KYTC: Frankfort (via email: Andrew.Logsdon@ky.gov)
Dave Harmon, KYTC: Frankfort (via email: Dave.Harmon@ky.gov)
Crystal Byrd, USACE: Louisville District (Crystal.D.Byrd@usace.army.mil)
Lee Andrews, USFWS: Frankfort (via email: kentuckyes@fws.gov)
Brian Crump, Columbia Regional Field Office (via email: Brian.Crump@ky.gov)
Alice Mandt, Upper Cumberland River Basin Coordinator (via email: mandt@ky.gov)
Michael Leathers, HMB Professional Engineers, Inc (via email: mleathers@hmbpe.com)

Matthew G. Bevin
Governor

Charles G. Snavely
Secretary

ENERGY AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

General Certification -- Letter of Permission Authorizing Transportation Projects (LRL-2006-259-pgj- Date: 28 Oct 2010)

This general certification is issued February 26, 2016, by the Kentucky Division of Water, 401 Water Quality Certification Program in conformity with the requirements of Sections 301, 302, 304, 306 and 401, as amended (33 U.S.C. §1341), of the Clean Water Act, as well as Kentucky Statute KRS 224.16-050 and Kentucky Administrative Regulations Title 401, Chapter 9 and 10.

For this and all general permits, the definition of surface water is as per 401 KAR 10:001 Chapter 10, Section 1(80): Surface Waters mean those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Lagoons used for waste treatment and effluent ditches that are situated on property owned, leased, or under valid easement by a permitted discharger are not considered surface waters of the commonwealth.

In addition to all the restrictions and conditions of the U.S. Army Corps of Engineers, Louisville District Letter of Permission Issuance (LRL-2006-259-pgj) hereby incorporated into this general certification (included herein), the following 401 Water Quality Certification criteria applies to all transportation projects certified under a Certified Letter of Permission issued by the Kentucky Division of Water, 401 Water Quality Certification Program:

1. The activity will not qualify for this general certification if it is proposed to occur within surface waters of the Commonwealth identified by the Kentucky Division of Water as Outstanding State or National Resource Water, Cold Water Aquatic Habitat, or Exceptional Water.

2. The activity will not qualify for this general certification if it is proposed to occur within surface waters of the Commonwealth identified as perpetually-protected (e.g. deed restriction, conservation easement) stream and/or wetland mitigation sites permitted by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.

Certification of Transportation Letter of Permission
Page 2

3. The Kentucky Division of Water may require an individual certification for any project if the project is likely to have adverse impacts to water quality or degrade the waters of the Commonwealth so that existing uses of the water body or downstream waters are precluded.
4. Activities qualifying for coverage under this General Water Quality Certification are subject to the following conditions:

- The proposed relocation of an existing stream or channel will be designed and constructed to ensure the stability of the relocated stream or channel. Stream habitat enhancements, such as bioengineering methods and/or best management practices for protecting water quality will be considered, on a case-by-case basis, during the design process. Documentation must be provided if stream habitat enhancements will not be used for the proposed stream relocation.

- Erosion and sedimentation pollution control plans and Best Management Practices must be designed, installed, and maintained in effective operating condition at all times during construction activities so that state water quality are maintained (401 KAR Chapter 10).

- Sediment and erosion control measures, such as check-dams constructed of any material, silt fencing, hay bales, etc., shall not be placed within surface waters of the Commonwealth, either temporarily or permanently, without notifying the Kentucky Division of Water. If placement of sediment and erosion control measures in surface waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in such a manner that may result in instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control devices shall be removed and the natural grade restored within the completion timeline of the activities.

- Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.

- Removal of riparian vegetation in the right-of-way shall be limited to that necessary.

- To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions.

- 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 in which such in-stream work is unavoidable, then it should be performed in low-flow or no-flow instances or in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation.

Certification of Transportation Letter of Permission
Page 3

- Fill shall not be of such composition that it will adversely affect the biological, chemical, or physical properties of the receiving waters and associated water quality standards. If rip-rap is utilized, it should be of such weight and size that bank stress or slump conditions will not be created because of its placement.

- If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the public supply system when such work will be done.

- Should evidence of stream and/or wetland pollution 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 Environmental Response Team (ERT) shall be notified immediately by calling 1-800-928-2380 or 502-564-2380.

This general certification does not have an expiration date, however if the need for changes develop or if the U.S. Army Corps of Engineers, Louisville District makes modifications to the Letter of Permission (LRL-2006-259-pgj- Date: 28 Oct 2010) then a certification modification may be issued. Non-compliance with the conditions of this general certification or failure to maintain Kentucky state water quality standards may result in civil penalties.

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

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 SWPBSupport@ky.gov

- **Projects that involve filling in the floodplain will require a floodplain construction permit from the Water Resources Branch.**
  Contact: Ron Dutta at (502) 782-6941

- **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: Elizabeth Harrod at (502) 782-6700

A complete listing of environmental programs administered by the Kentucky Department for Environmental Protection is available from Pete Goodmann by calling (502) 782-6956.

GENERAL CONDITIONS FOR WATER QUALITY CERTIFICATION

1. The Kentucky Division of Water may require submission of a formal application for an Individual Certification for any project if the project has been determined to likely have a significant adverse effect upon water quality or degrade the waters of the Commonwealth so that existing uses of the water body or downstream waters are precluded.

2. Nationwide permits issued by the U.S. Army Corps of Engineers for projects in Outstanding State Resource Waters, Cold Water Aquatic Habitats, and Exceptional Waters as defined by 401 KAR 10:026 shall require individual water quality certifications.

3. Projects requiring in-stream stormwater detention/retention basins shall require individual water quality certifications.

4. Erosion and sedimentation pollution control plans and Best Management Practices must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur.

5. Sediment and erosion control measures (e.g., check-dams, silt fencing, or hay bales) shall not be placed within surface waters of the Commonwealth, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, placement shall not be conducted in such a manner that may cause instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control measures shall be removed and the natural grade restored prior to withdrawal from the site.

6. Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.

7. To the maximum extent practicable, all in-stream work under this certification shall be performed during low flow.

8. 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 in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize re-suspension of sediments and disturbance to the channel, banks, or riparian vegetation.

9. If there are water supply intakes located downstream that may be affected by increased turbidity, the permittee shall notify the operator when work will be performed.

10. Removal of existing riparian vegetation should be restricted to the minimum necessary for project construction.

11. Should stream pollution, 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.

Kentucky Transportation Cabinet

Highway District 8

And

_____(2), Construction

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

Groundwater protection plan

For Highway Construction Activities

For

08-0059.25 KY 80 – KY 461 Interchange and Widening Project: CID ## -

Revised 3/4/2016

Project information

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

1. Owner – Kentucky Transportation Cabinet, District 8

2. Resident Engineer: (2)

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

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

4. Project Control Number (2)

5. Route (Address) KY 80 – KY 461 Pulaski County

6. Latitude/Longitude (project mid-point) 37/09/34, -84/29/52

7. County (project mid-point) Pulaski

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

9. Projected completion date: (2)

A. Site description:

1. Nature of Construction Activity: Improve KY 461 from KY 80 to Buck Creek including Interchange

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

3. Projected volume of material to be moved 2.9 Million CY

4. Estimate of total project area (acres) 346

5. Estimate of area to be disturbed (acres) 346

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

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

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

9. Receiving water name Buck Creek

10. TMDLs and Pollutants of Concern in Receiving Waters: (1 DEA)

11. Site map – Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.

12. Potential sources of pollutants:

The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include oil/fuel/grease from servicing

and operating construction equipment, concrete washout water, sanitary wastes and trash/debris. (3)

B. Sediment and Erosion Control Measures:

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

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

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

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

   - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
   - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water.

Areas that have not been opened by the contractor will be inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.

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

- Removal of Silt Traps Type B from ditches and drainways if they are protected with other BMP's which are sufficient to control erosion, i.e. Erosion Control Blanket or Permanent Seeding and Protection on moderate grades.
- Permanent Seeding and Protection
- Placing Sod
- Planting trees and/or shrubs where they are included in the project

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

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

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

- **Good Housekeeping:**

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

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

- **Hazardous Products:**

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

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

The following product-specific practices will be followed onsite:

- **Petroleum Products:**

Vehicles and equipment that are fueled and maintained on site will be monitored for leaks, and receive regular preventative maintenance to reduce the chance of

leakage. Petroleum products onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.

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

- **Fertilizers:**

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

- **Paints:**

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

- **Concrete Truck Washout:**

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

- **Spill Control Practices**

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

- Manufacturers' recommended methods for spill cleanup will be clearly posted. All personnel will be made aware of procedures and the location of the information and cleanup supplies.

- Materials and equipment necessary for spill cleanup will be kept in the material storage area. Equipment and materials will include as appropriate, brooms, dust pans, mops, rags, gloves, oil absorbents, sand, sawdust, and plastic and metal trash containers.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contract with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
- The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
- Spills of products will be cleaned up promptly. Wastes from spill clean up will be disposed in accordance with appropriate regulations.

D. Other State and Local Plans

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

E. Maintenance

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

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

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

F. Inspections

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

- All erosion prevention and sediment control measures will be inspected at least once each week and following any rain of one-half inch or more.
- Inspections will be conducted by individuals that have 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.

- 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:

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

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

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

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

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

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

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

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

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

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

(a) General information about this project is covered in the Project information;
(b) Activities that require a groundwater protection plan have been identified above;
(c) Practices that will protect groundwater from pollution are addressed in section C. Other control measures.
(d) Implementation schedule – all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity;
(e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job

function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provide to the resident engineer.

(f) Areas of the project and groundwater plan activities will be inspected as part of the weekly sediment and erosion control inspections

(g) Certification (see signature page.)

KyTC BMP Plan for Project CID ## -

Contractor and Resident Engineer Plan certification

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

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

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

Resident Engineer and Contractor Certification:

(2) Resident Engineer signature

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

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

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

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

Sub-Contractor Certification

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

Subcontractor

Name:
Address:
Address:

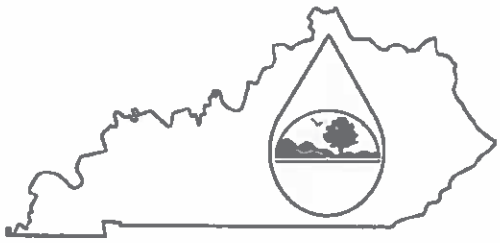
Phone:

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

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

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

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



KENTUCKY POLLUTION DISCHARGE ELIMINATION SYSTEM (KPDES)

Notice of Intent (NOI) for coverage of Storm Water Discharge Associated with Construction Activities Under the KPDES Storm Water General Permit KYR100000

Click here for Instructions
(Controls/KPDES_FormKYR10_Instructions.htm)

Click here to obtain information and a copy of the KPDES General Permit.
(http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf)

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Reason for Submittal:(*)	Agency Interest ID:	Permit Number:(✓)
Application for New Permit Coverage	Agency Interest ID	KYR10

If change to existing permit coverage is requested, describe the changes for which modification of coverage is being sought:(✓)

ELIGIBILITY:
Stormwater discharges associated with construction activities disturbing individually one (1) acre or more, including, in the case of a common plan of development, contiguous construction activities that cumulatively equal one (1) acre or more of disturbance.

EXCLUSIONS:
The following are excluded from coverage under this general permit:
1) Are conducted at or on properties that have obtained an individual KPDES permit for the discharge of other wastewaters which requires the development and implementation of a Best Management Practices (BMP) plan;
2) Any operation that the DOW determines an individual permit would better address the discharges from that operation;
3) Any project that discharges to an Impaired Water listed in the most recent Integrated Report, §305(b) as impaired for sediment and for which an approved TMDL has been developed.

SECTION I – FACILITY OPERATOR INFORMATION (PERMITTEE)

Company Name:(✓)	First Name:(✓)	M.I.:	Last Name:(✓)
Kentucky Transportation Cabinet - District 8	Tamra	K	Wilson

Mailing Address:(*)	City:(*)	State:(*)	Zip:(*)
PO	Somerset	Kentucky	42502

eMail Address:(*)	Business Phone:(*)	Alternate Phone:
Tamra.Wilson@ky.gov	5022296931	6066774017

SECTION II – GENERAL SITE LOCATION INFORMATION

Project Name:(*)	Status of Owner/Operator(*)	SIC Code(*)
Improve KY461 from KY80 to Buck Creek Bridge including Interchange	State Government	1611 Highway and Street Const

Company Name:(✓)	First Name:(✓)	M.I.:	Last Name:(✓)
Kentucky Transportation Cabinet - District 8	William	MI	Lucas

Site Physical Address:(*)
Interchange at KY461 & KY80

City:(*)	State:(*)	Zip:(*)
Somerset	Kentucky	42502

County:(*)	Latitude(decimal degrees)(*)DMS to DD Converter (https://www.fcc.gov/media/radio/dms-decimal)	Longitude(decimal degrees)(*)
Pulaski	37.159556	-84.497678

SECTION III -- SPECIFIC SITE ACTIVITY INFORMATION

Project Description:(*)
Improve KY461 from KY80 to Buck Creek Bridge including Interchange

a. For single projects provide the following information

Total Number of Acres in Project:(✓)	Total Number of Acres Disturbed (✓)
Project Acres	Disturbed Acres
Anticipated Start Date:(✓)	Anticipated Completion Date (✓)

b. For common plans of development provide the following information

Total Number of Acres in Project:(✓)	Total Number of Acres Disturbed (✓)
# Acre(s)	# Acre(s)
Number of individual lots in development, if applicable:(✓)	Number of lots in development:(✓)
# lot(s)	# lot(s)
Total acreage of lots intended to be developed (✓)	Number of acres intended to be disturbed at any one time:(✓)
Project Acres	Disturbed Acres
Anticipated Start Date (✓)	Anticipated Completion Date (✓)

List Building Contractor(s) at the time of Application:(*)

	Company Name
+	

SECTION IV – IF THE PERMITTED SITE DISCHARGES TO A WATER BODY THE FOLLOWING INFORMATION IS REQUIRED

Discharge Point(s):

	Unnamed Tributary?	Latitude	Longitude	Receiving Water Name	
1	Yes	37.178931	-84.478821	Buck Creek	Delete
2	Yes	37.185044	-84.473021	Buck Creek	Delete
3	Yes	37.187219	-84.471556	Buck Creek	Delete
4	Yes	37.191548	-84.469372	Buck Creek	Delete
5	Yes	37.192546	-84.469729	Buck Creek	Delete
6	Yes	37.198991	-84.463909	Buck Creek	Delete
7	Yes	37.203314	-84.460402	Buck Creek	Delete
8	Yes	37.204403	-84.459504	Buck Creek	Delete
9	Yes	37.153539	-84.513136	Flat Lick Creek	Delete
10	Yes	37.153739	-84.513249	Flat Lick Creek	Delete

SECTION V -- IF THE PERMITTED SITE DISCHARGES TO A MS4 THE FOLLOWING INFORMATION IS REQUIRED

Name of MS4:

Date of application/notification to the MS4 for construction site permit coverage:	Discharge Point(s):(*)
Date	Latitude / Longitude

SECTION VI -- WILL THE PROJECT REQUIRE CONSTRUCTION ACTIVITIES IN A WATER BODY OR THE RIPARIAN ZONE?

Will the project require construction activities in a water body or the riparian zone?:(*)	
If Yes, describe scope of activity: (✓)	describe scope of activity
Is a Clean Water Act 404 permit required?:(*)	

Is a Clean Water Act 401 Water Quality Certification required?:(*)	

SECTION VII – NOI PREPARER INFORMATION

First Name:(*)	M.I.:	Last Name:(*)	Company Name:(*)
Jami	B	West	Kentucky Transportation Cabinet - District 8

Mailing Address:(*)	City:(*)	State:(*)	Zip:(*)
PO Box 780	Somerset	Kentucky	42502

eMail Address:(*)	Business Phone:(*)	Alternate Phone:
jamib.west@ky.gov	6066774017	2705850109

SECTION VIII -- ATTACHMENTS

Facility Location Map:(*)	Upload file
Supplemental Information:	Upload file

SECTION IX -- CERTIFICATION

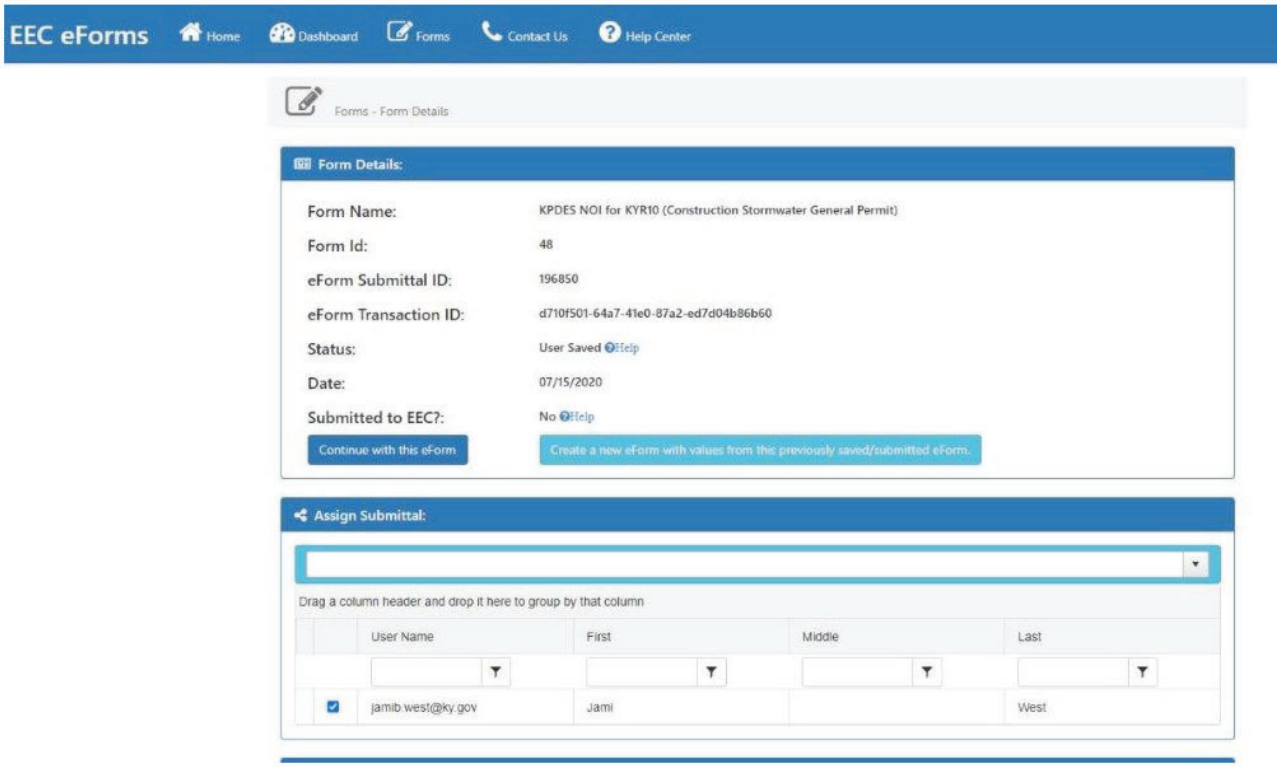
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:(*)	Title:(*)
Tamra K Wilson	Chief District Engineer

First Name:(*)	M.I.:	Last Name:(*)
Tamra	K	Wilson

eMail Address:(*)	Business Phone:(*)	Alternate Phone:	Signature Date:(*)
Tamra.Wilson@ky.gov	5022296931	Phone	Date

Click to Save Values for Future Retrieval | Click to Submit to EEC


EEC eForms
Home
Dashboard
Forms
Contact Us
Help Center
Forms - Form Details
Form Details:
Form Name:
KPDES NOI for KYR10 (Construction Stormwater General Permit)
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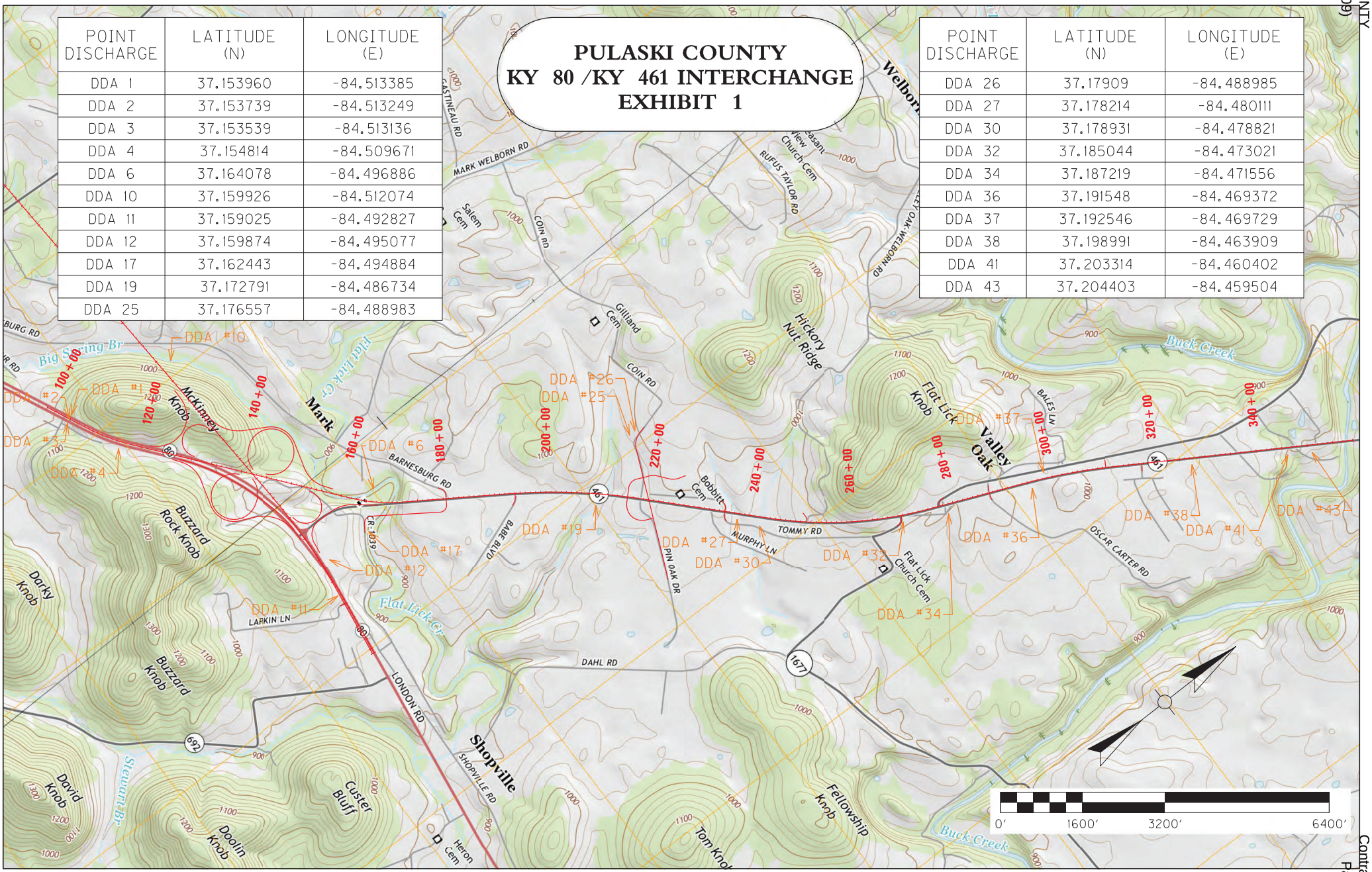
Status:
User Saved Help
Date:
07/15/2020
Submitted to EEC?:
No Help
Continue with this eForm
Create a new eForm with values from this previously saved/submitted eForm.
Assign Submittal:
Drag a column header and drop it here to group by that column
User Name
First
Middle
Last
jamib.west@ky.gov
Jami
West

PULASKI COUNTY
KY 80 /KY 461 INTERCHANGE
EXHIBIT 1

POINT DISCHARGE	LATITUDE (N)	LONGITUDE (E)
DDA 1	37.153960	-84.513385
DDA 2	37.153739	-84.513249
DDA 3	37.153539	-84.513136
DDA 4	37.154814	-84.509671
DDA 6	37.164078	-84.496886
DDA 10	37.159926	-84.512074
DDA 11	37.159025	-84.492827
DDA 12	37.159874	-84.495077
DDA 17	37.162443	-84.494884
DDA 19	37.172791	-84.486734
DDA 25	37.176557	-84.488983

POINT DISCHARGE	LATITUDE (N)	LONGITUDE (E)
DDA 26	37.17909	-84.488985
DDA 27	37.178214	-84.480111
DDA 30	37.178931	-84.478821
DDA 32	37.185044	-84.473021
DDA 34	37.187219	-84.471556
DDA 36	37.191548	-84.469372
DDA 37	37.192546	-84.469729
DDA 38	37.198991	-84.463909
DDA 41	37.203314	-84.460402
DDA 43	37.204403	-84.459504



CAP NOTES:

1. Parcel 27 (Eldridge) – Place C/A fencing prior to start of construction activities

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 2019* and *Standard Drawings, Edition of 2020.*

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

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SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

2.0 MATERIALS.

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

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

2.2 Sign and Controls. All signs must:

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

1I

12) Allow an on-off flashing sequence at an adjustable rate.
13) Provide a sight to aim the message.
14) Provide a LED display color of approximately 590 nm amber.
15) Provide a controller that is password protected.
16) Provide a security device that prevents unauthorized individuals from accessing the controller.
17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

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

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

2.3 Power.

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

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

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

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

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

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

1I

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

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

Code	Pay Item	Pay Unit
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

11D

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 Standard Specifications for Road and Bridge Construction, current edition.

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.

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.

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

11E

SPECIAL NOTE FOR BORING AND JACKING STEEL PIPE WITHOUT CARRIER PIPE

This Special Note will apply where 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. Bore and jack steel pipe. Use this note when no carrier pipe will be encased.

2.0 MATERIALS.

2.1 Pipe. Provide plain end steel pipe with a specific minimum yield strength, SMYS, of at least 35,000 psi and tensile strength of 60,000 psi per API-5L grade B material. The steel pipe supplied shall be manufactured by the seamless, electric-weld, submerged-arc weld or gas metal-arc well process as specified in API –5L. Certification of 35,000 psi SMYS shall be furnished by the supplier through the Contractor to the Engineer to retain 3 copies.

MINIMUM WALL THICKNESS FOR STEEL PIPE	
Nominal Diameter (Inches)	Wall Thickness (Inches)
18 or less	0.375
24	0.500
30	0.500
36	0.532
42	0.625

2.2 Grout. Conform to Subsection 601.03.03.

2.3 High Grade Bentonite. Conform to the following:

API 13A Section 4		
Requirement	Specification	Result
Viscometer Dial Reading at 600 rpm	30, minimum	40
Yield Point/Plastic Viscosity Ratio	3, maximum	3.00 maximum
Filtrate Volume	15 cm3, maximum	14.50 maximum
Residue greater than 75 micrometers	4.0 wt percent maximum	1.0-1.5 %
Moisture	10.0 wt percent maximum	9.0-9.5%

3.0 CONSTRUCTION. Perform the following:

1. Locate a suitable pit and obtain the Engineer's approval.
2. Excavate the pit or trenches for the BORE AND JACK operation and for placing the end joints of pipe, when required. Securely sheet and brace the pits or trenches to prevent caving, where necessary.

3. When installing pipe under railroads, highways, streets, or other facilities by Bore and Jack, perform construction without interfering with the facility operation or weakening the roadbed or structure.
4. Place excavated material near the top of the working pit and dispose of it as required. Use water or other fluids with the boring operation to lubricate the cuttings. Do not perform jetting.
5. In unconsolidated soil formations, use a gel-forming collodial drilling fluid with at least 10 percent of high grade bentonite to consolidate excavated material, seal the walls of the hole, and lubricate subsequent removal of material and immediate pipe installation.
6. Ensure that the diameter of the excavation conforms to the outside diameter of the pipe as closely as possible.
7. Pressure grout voids that develop during the installation operation and that the Engineer determines are detrimental to the Work.
8. To force the pipe through the roadbed into the bored space, use a jack with a head constructed to apply uniform pressure around the ring of the pipe, which shall be square cut.
9. Set the pipe to be jacked on guides, braced together to properly support the pipe section and to direct it to the proper line and grade.
10. When the installation is made by concurrent boring and jacking, solidly weld all joints. Ensure the weld is strong enough to withstand the forces exerted from the boring and jacking operations as well as the vertical loading imposed on the pipe after installation and that it provides a smooth, non-obstructing joint in the interior of the pipe.
11. When the pipe is installed in open trench, bed and backfill according to Section 701.
12. The line and grade from the pipe's final position, as shown on plans, may vary no more than 2 percent in lateral alignment and one percent in vertical grade. Ensure that the final grade of the flow line is in the direction indicated on the Plans.
13. Use a cutting edge around the head end. Extend it a short distance beyond the pipe end with inside angles or lugs to keep the cutting edge from slipping back into the pipe.
14. Once the pipe installation begins, proceed with the operation without interruption to prevent the pipe from becoming firmly set in the embankment.
15. Remove and replace pipe damaged in jacking operations.
16. After completing the installation, backfill the excavated pits and trenches with flowable fill according to Section 601.03.03 B) 5 a) if the pit is in median area where it will have pavement over it.

4.0 MEASUREMENT. The Department will measure the completed length of Bore and Jacked pipe through the flowline from end to end in linear feet. The Department will not measure pressure grouting voids or removal and replacement of pipe damaged in jacking operations for payment and will consider it incidental to Bore and Jack. When abandoning a bore hole due to mechanical malfunction, improper alignment, or other problems due to construction operations, the Department will not measure the backfill and relocation for payment and will consider it incidental to this item of work. When abandoning a bore hole due to an unforeseen physical obstruction or situation, the Department will measure the work according to a negotiated supplemental agreement.

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

11E

Code	Pay Item	Pay Unit
----	Bore and Jack, Size Pipe	Linear Foot

The Department will consider payment as full compensation for all materials, earthwork, shoring, pipe and work required under this section.

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 Standard Specifications for Road and Bridge Construction, current edition.

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).

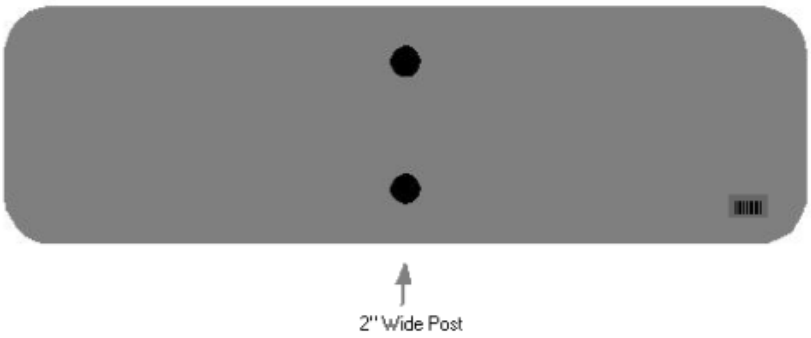
The installation of the permanent sign will be measured in accordance to Section 715.

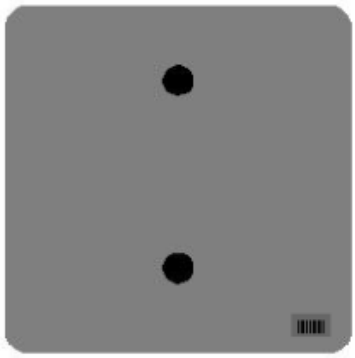
5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
24631EC	Barcode Sign Inventory	Each

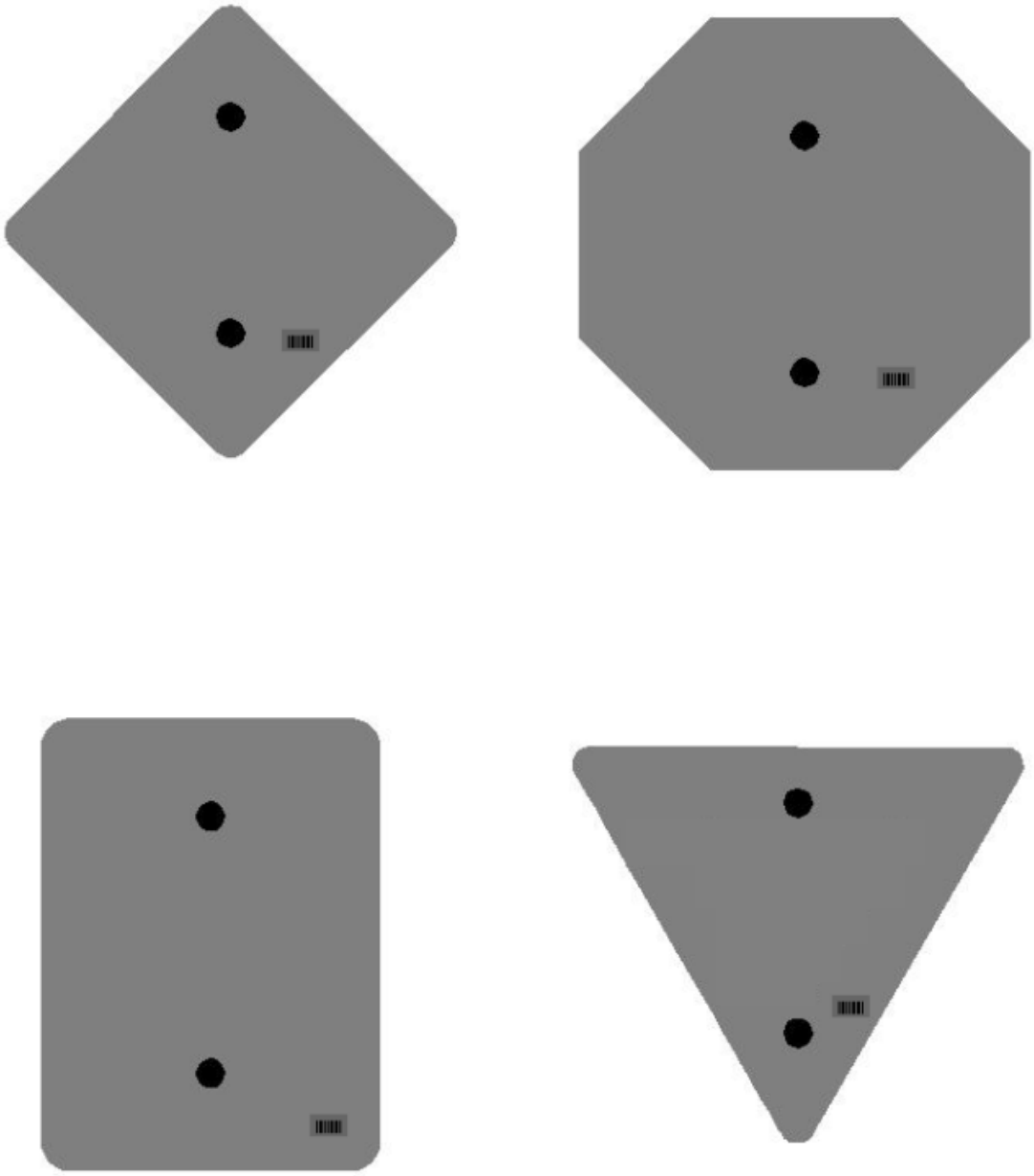
The Department will not make payment for this item until all barcodes are installed and sign inventory is complete on every permanent sign installed on the project. The Department will make payment for installation of the permanent sign in accordance to Section 715. The Department will consider payment as full compensation for all work required under this special note.

One Sign Post

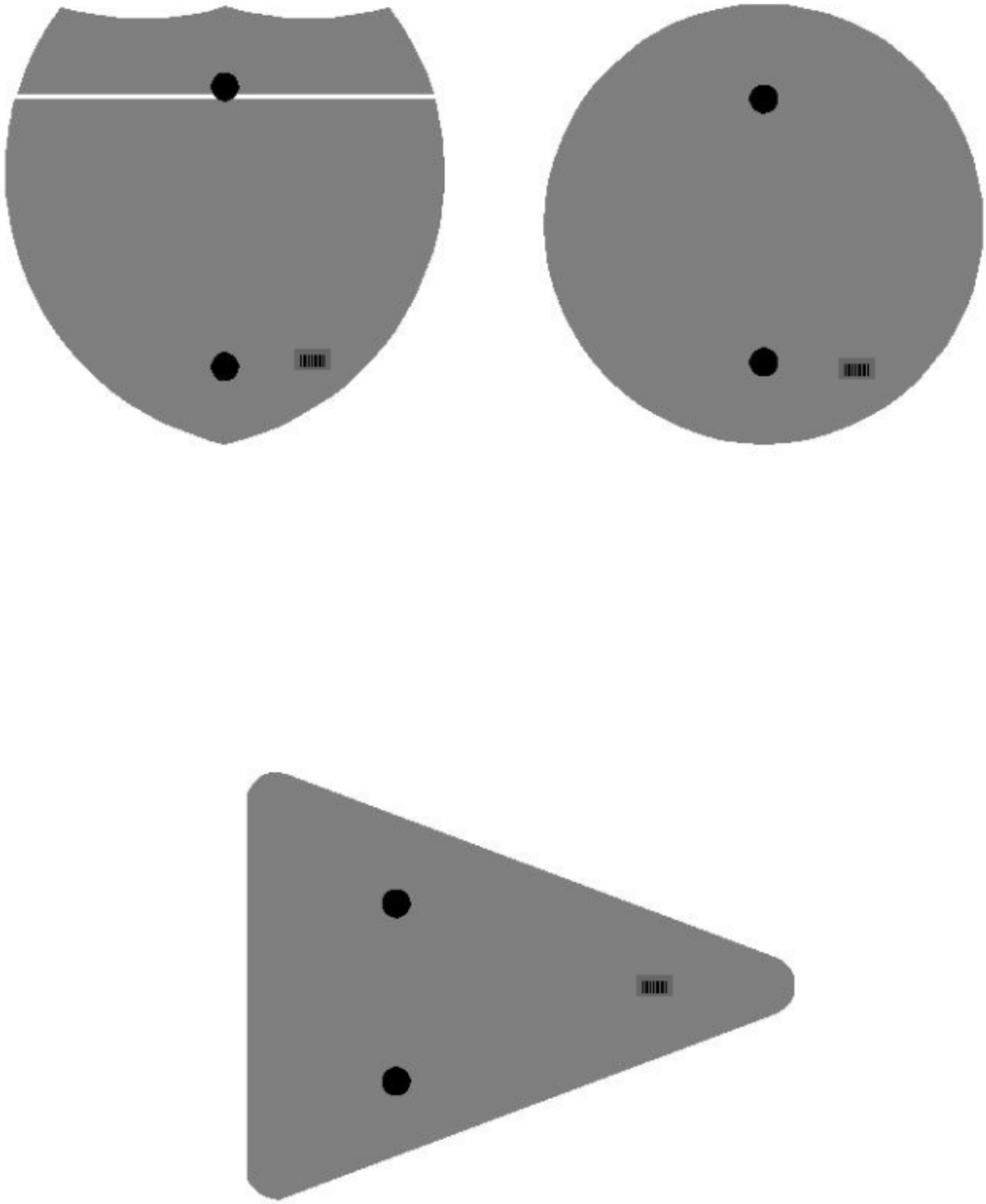




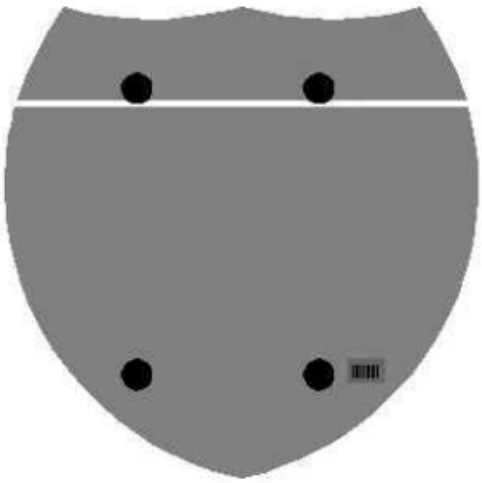
One Sign Post



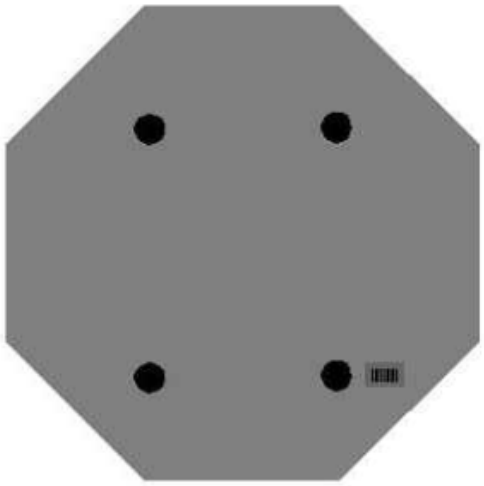
One Sign Post



Double Sign Post

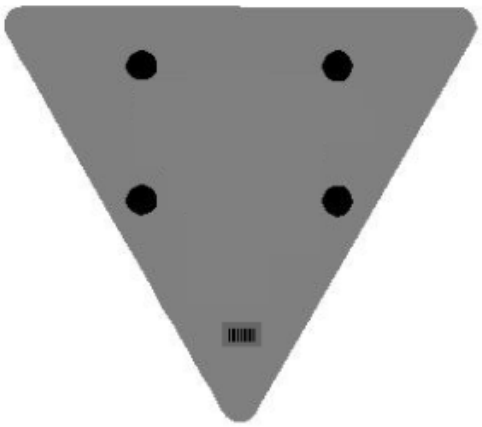


Interstate
Shield



48" Stop

2 Post Signs



11N

SPECIAL NOTE FOR LONGITUDINAL PAVEMENT JOINT ADHESIVE

1. DESCRIPTION. This specification covers the requirements and practices for applying an asphalt adhesive material to the longitudinal joint of the surface course of an asphalt pavement. Apply the adhesive to the face of longitudinal joint between driving lanes for the first lane paved. Then, place and compact the adjacent lane against the treated face to produce a strong, durable, waterproof longitudinal joint.

2. MATERIALS, EQUIPMENT, AND PERSONNEL.

2.1 Joint Adhesive. Provide material conforming to Subsection 2.1.1.

2.1.1 Provide an adhesive conforming to the following requirements:

Property	Specification	Test Procedure
Viscosity, 400 ° F (Pa·s)	4.0 – 10.0	ASTM D 4402
Cone Penetration, 77 ° F	60 – 100	ASTM D 5329
Flow, 140 ° F (mm)	5.0 max.	ASTM D 5329
Resilience, 77 ° F (%)	30 min.	ASTM D 5329
Ductility, 77 ° F (cm)	30.0 min.	ASTM D 113
Ductility, 39 ° F (cm)	30.0 min.	ASTM D 113
Tensile Adhesion, 77 ° F (%)	500 min.	ASTM D 5329, Type II
Softening Point, ° F	171 min.	AASHTO T 53
Asphalt Compatibility	Pass	ASTM D 5329

Ensure the temperature of the pavement joint adhesive is between 380 and 410 °F when the material is extruded in a 0.125-inch-thick band over the entire face of the longitudinal joint.

2.2. Equipment.

2.2.1 Melter Kettle. Provide an oil-jacketed, double-boiler, melter kettle equipped with any needed agitation and recirculating systems.

2.2.2 Applicator System. Provide a pressure-feed-wand applicator system with an applicator shoe attached.

2.3 Personnel. Ensure a technical representative from the manufacturer of the pavement joint adhesive is present during the initial construction activities and available upon the request of the Engineer.

3. CONSTRUCTION.

3.1 Surface Preparation. Prior to the application of the pavement joint adhesive, ensure the face of the longitudinal joint is thoroughly dry and free from dust or any other debris that would inhibit adhesion. Clean the joint face by the use of compressed air.

Ensure this preparation process occurs shortly before application to prevent the return of debris on the joint face.

3.2 Pavement Joint Adhesive Application. Ensure the ambient temperature is a minimum of 40 ^{o} F during the application of the pavement joint adhesive. Prior to applying the adhesive, demonstrate competence in applying the adhesive according to this note to the satisfaction of the Engineer. Heat the adhesive in the melter kettle to the specified temperature range. Pump the adhesive from the melter kettle through the wand onto the vertical face of the cold joint. Apply the adhesive in a continuous band over the entire face of the longitudinal joint. Do not use excessive material in either thickness or location. Ensure the edge of the extruded adhesive material is flush with the surface of the pavement. Then, place and compact the adjacent lane against the joint face. Remove any excessive material extruded from the joint after compaction (a small line of material may remain).

3.3 Pavement Joint Adhesive Certification. Furnish the joint adhesive's certification to the Engineer stating the material conforms to all requirements herein prior to use.

3.4 Sampling and Testing. The Department will require a random sample of pavement joint adhesive from each manufacturer's lot of material. Extrude two 5 lb. samples of the heated material and forward the sample to the Division of Materials for testing. Reynolds oven bags, turkey size, placed inside small cardboard boxes or cement cylinder molds have been found suitable. Ensure the product temperature is 400°F or below at the time of sampling.

4. MEASUREMENT. The Department will measure the quantity of Pavement Joint Adhesive in linear feet. The Department will not measure for payment any extra materials, labor, methods, equipment, or construction techniques used to satisfy the requirements of this note. The Department will not measure for payment any trial applications of Pavement Joint Adhesive, the cleaning of the joint face, or furnishing and placing the adhesive. The Department will consider all such items incidental to the Pavement Joint Adhesive.

5. PAYMENT. The Department will pay for the Pavement Joint Adhesive at the Contract unit bid price and apply an adjustment for each manufacturer's lot of material based on the degree of compliance as defined in the following schedule. When a sample fails on two or more tests, the Department may add the deductions, but the total deduction will not exceed 100 percent.

11N

Pavement Joint Adhesive Price Adjustment Schedule						
Test	Specification	100% Pay	90% Pay	80% Pay	50% Pay	0% Pay
Joint Adhesive Referenced in Subsection 2.1.1						
Viscosity, 400 º F (Pa•s)			3.0-3.4	2.5-2.9	2.0-2.4	≤1.9
ASTM D 3236	4.0-10.0	3.5-10.5	10.6-11.0	11.1-11.5	11.6-12.0	≥ 12.1
Cone Penetration, 77 º F			54-56	51-53	48-50	≤ 47
ASTM D 5329	60-100	57-103	104-106	107-109	110-112	≥ 113
Flow, 140 º F (mm) ASTM D 5329	≤ 5.0	≤ 5.5	5.6-6.0	6.1-6.5	6.6-7.0	≥ 7.1
Resilience, 77 º F (%) ASTM D 5329	≥ 30	≥ 28	26-27	24-25	22-23	≤ 21
Tensile Adhesion, 77 º F (%) ASTM D 5329	≥ 500	≥ 490	480-489	470-479	460-469	≤ 459
Softening Point, º F AASHTO T 53	≥ 171	≥ 169	166-168	163-165	160-162	≤ 159
Ductility, 77 º F (cm) ASTM D 113	≥ 30.0	≥ 29.0	28.0-28.9	27.0-27.9	26.0-26.9	≤ 25.9
Ductility, 39 º F (cm) ASTM D 113	≥ 30.0	≥ 29.0	28.0-28.9	27.0-27.9	26.0-26.9	≤ 25.9

Code	Pay Item	Pay Unit
20071EC	Joint Adhesive	Linear Foot

May 7, 2014

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:

Code	Pay Item	Pay Unit
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

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).

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.

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.

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).

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.

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.

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.

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 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.

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.

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.

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

Revised: January 25, 2017

Standard Title VI/Non-Discrimination Assurances

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, **Federal Highway Administration**, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the **Federal Highway Administration** to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the **Federal Highway Administration**, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the **Federal Highway Administration** may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the **Federal Highway Administration** may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

Standard Title VI/Non-Discrimination Statutes and Authorities

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 -- 12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

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

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

TRAINING SPECIAL PROVISIONS

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled ``Specific Equal Employment Opportunity Responsibilities," (Attachment 1), and is in implementation of 23 U.S.C. 140(a).

As part of the contractor's equal employment opportunity affirmative action program training shall be provided as follows:

> The contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of trainees to be trained under these special provisions and in this contract is shown in “Special Notes Applicable to Project” in the bid proposal.

In the event that a contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction the contractor shall submit to the Kentucky Transportation Cabinet, Department of Highways for its approval, an acceptable training program on forms provided by the Cabinet indicating the number of trainees to be trained in each selected classification. Failure to provide the Cabinet with the proper documentation evidencing an acceptable training program prior to commencing construction shall cause the Cabinet to suspend the operations of the contractor with (if applicable) working days being charged as usual against the contract time or (if applicable), no additional contract time being granted for the suspension period. The Cabinet will not be liable for the payment of any work performed during the suspension period due to the failure of the contractor to provide an acceptable training program. Said suspension period shall be terminated when an acceptable training program is received by the Cabinet. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the findings in each case. The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Kentucky Transportation Cabinet, Department of Highways and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the contractor will be reimbursed for each hour of training given an employee on this contract in accordance with an approved training program. As approved by the engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. A contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

1-1-93

"General Decision Number: KY20200107 01/03/2020

Superseded General Decision Number: KY20190107

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 $10.80 for calendar year 2020 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 $10.80 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 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on

the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2020

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

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

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, Batcher 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 to an employee at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty (40) hours in such workweek. 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 Pulaski County.

PART IV

INSURANCE

Refer to
Kentucky Standard Specifications for Road and Bridge Construction,
current edition

PART V

BID ITEMS

201305

PROPOSAL BID ITEMS

Report Date 9/22/20

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE (REVISED: 9-11-20)	176,083.00	TON		$	
0020	00020		TRAFFIC BOUND BASE	5,000.00	TON		$	
0030	00100		ASPHALT SEAL AGGREGATE	929.00	TON		$	
0040	00103		ASPHALT SEAL COAT	112.00	TON		$	
0050	00190		LEVELING & WEDGING PG64-22 (REVISED: 9-11-20)	19,501.00	TON		$	
0060	00214		CL3 ASPH BASE 1.00D PG64-22	15,761.00	TON		$	
0070	00217		CL4 ASPH BASE 1.00D PG64-22	37,913.00	TON		$	
0080	00219		CL4 ASPH BASE 1.00D PG76-22	46,111.00	TON		$	
0090	00221		CL2 ASPH BASE 0.75D PG64-22 (REVISED: 9-11-20)	3,635.00	TON		$	
0100	00301		CL2 ASPH SURF 0.38D PG64-22 (REVISED: 9-11-20)	1,302.00	TON		$	
0110	00342		CL4 ASPH SURF 0.38A PG76-22	19,529.00	TON		$	
0120	00388		CL3 ASPH SURF 0.38B PG64-22	5,641.00	TON		$	
0130	02677		ASPHALT PAVE MILLING & TEXTURING	15,869.00	TON		$	
0140	20071EC		JOINT ADHESIVE	205,825.00	LF		$	
0150	24891EC		PAVE MOUNT INFRARED TEMP EQUIPMENT	5,273,734.00	SF		$	
0160	24970EC		ASPHALT MATERIAL FOR TACK NON-TRACKING	198.00	TON		$	
0170	24986EC		HMA ELECTRONIC DELIVERY MGMT SYSTEM	1.00	L S		$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0180	00078		CRUSHED AGGREGATE SIZE NO 2	1,360.00	TON		$	
0190	01000		PERFORATED PIPE-4 IN	863.00	LF		$	
0200	01010		NON-PERFORATED PIPE-4 IN	116.00	LF		$	
0210	01020		PERF PIPE HEADWALL TY 1-4 IN	2.00	EACH		$	
0220	01028		PERF PIPE HEADWALL TY 3-4 IN	7.00	EACH		$	
0230	01032		PERF PIPE HEADWALL TY 4-4 IN	1.00	EACH		$	
0240	01691		FLUME INLET TYPE 2	9.00	EACH		$	
0250	01810		STANDARD CURB AND GUTTER	1,472.00	LF		$	
0260	01875		STANDARD HEADER CURB	216.00	LF		$	
0270	01891		ISLAND HEADER CURB TYPE 2 (REVISED: 9-11-20)	58.00	LF		$	
0280	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	116.00	EACH		$	
0290	01983		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL YELLOW	72.00	EACH		$	
0300	01986		DELINEATOR FOR BARRIER WALL-B/Y	6.00	EACH		$	
0310	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	151.00	EACH		$	
0320	01990		DELINEATOR FOR BARRIER WALL-B/W	40.00	EACH		$	
0330	02003		RELOCATE TEMP CONC BARRIER (REVISED: 9-11-20)	1,940.00	LF		$	
0340	02014		BARRICADE-TYPE III	14.00	EACH		$	

201305

PROPOSAL BID ITEMS

Report Date 9/22/20

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0350	02091		REMOVE PAVEMENT	11,775.00	SQYD		$	
0360	02159		TEMP DITCH	22,680.00	LF		$	
0370	02160		CLEAN TEMP DITCH	11,340.00	LF		$	
0380	02200		ROADWAY EXCAVATION	2,913,773.00	CUYD		$	
0390	02242		WATER	10,000.00	MGAL		$	
0400	02262		FENCE-WOVEN WIRE TYPE 1 (REVISED: 9-11-20)	21,458.00	LF		$	
0410	02268		REMOVE & REPLACE FENCE (REVISED: 9-11-20)	29,839.00	LF		$	
0420	02351		GUARDRAIL-STEEL W BEAM-S FACE	22,350.00	LF		$	
0430	02352		GUARDRAIL-STEEL W BEAM-D FACE	275.00	LF		$	
0440	02360		GUARDRAIL TERMINAL SECTION NO 1	12.00	EACH		$	
0450	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A	13.00	EACH		$	
0460	02365		CRASH CUSHION TYPE IX-A	2.00	EACH		$	
0470	02367		GUARDRAIL END TREATMENT TYPE 1	26.00	EACH		$	
0480	02369		GUARDRAIL END TREATMENT TYPE 2A	29.00	EACH		$	
0490	02381		REMOVE GUARDRAIL	6,749.00	LF		$	
0500	02387		GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	5.00	EACH		$	
0510	02391		GUARDRAIL END TREATMENT TYPE 4A	3.00	EACH		$	
0520	02429		RIGHT-OF-WAY MONUMENT TYPE 1	92.00	EACH		$	
0530	02432		WITNESS POST	22.00	EACH		$	
0540	02471		FILL AND CAP SINKHOLE	2.00	EACH		$	
0550	02488		CHANNEL LINING CLASS IV (REVISED: 9-11-20)	35,976.00	CUYD		$	
0560	02545		CLEARING AND GRUBBING APPROX 305 ACRES (REVISED: 9-22-20)	1.00	LS		$	
0570	02555		CONCRETE-CLASS B	372.75	CUYD		$	
0580	02562		TEMPORARY SIGNS	3,280.00	SQFT		$	
0590	02585		EDGE KEY	317.00	LF		$	
0600	02602		FABRIC-GEOTEXTILE CLASS 1 (FOR PIPE)	30,000.00	SQYD		$	
0610	02603		FABRIC-GEOTEXTILE CLASS 2	6,200.00	SQYD		$	
0620	02607		FABRIC-GEOTEXTILE CLASS 2 FOR PIPE	25,764.00	SQYD	$2.00	$	$51,528.00
0630	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		$	
0640	02651		DIVERSIONS (BY-PASS DETOURS)	1.00	LS		$	
0650	02671		PORTABLE CHANGEABLE MESSAGE SIGN	10.00	EACH		$	
0660	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		$	
0670	02690		SAFELOADING	288.00	CUYD		$	
0680	02692		SETTLEMENT PLATFORM	2.00	EACH		$	
0690	02696		SHOULDER RUMBLE STRIPS	93,479.00	LF		$	
0700	02701		TEMP SILT FENCE	22,680.00	LF		$	
0710	02703		SILT TRAP TYPE A	346.00	EACH		$	
0720	02704		SILT TRAP TYPE B	346.00	EACH		$	
0730	02705		SILT TRAP TYPE C	346.00	EACH		$	
0740	02706		CLEAN SILT TRAP TYPE A	346.00	EACH		$	
0750	02707		CLEAN SILT TRAP TYPE B	346.00	EACH		$	
0760	02708		CLEAN SILT TRAP TYPE C	346.00	EACH		$	
0770	02726		STAKING	1.00	LS		$	
0790	02775		ARROW PANEL	4.00	EACH		$	

201305

PROPOSAL BID ITEMS

Report Date 9/22/20

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0800	02898		RELOCATE CRASH CUSHION (REVISED: 9-11-20)	7.00	EACH		$	
0810	02929		CRASH CUSHION TYPE IX	2.00	EACH		$	
0820	03171		CONCRETE BARRIER WALL TYPE 9T (REVISED: 9-11-20)	1,140.00	LF		$	
0830	03340		STEEL PIPE-2 1/2 IN	73.50	LF		$	
0840	03343		STEEL PIPE-4 IN	73.50	LF		$	
0850	05950		EROSION CONTROL BLANKET	43,705.00	SQYD		$	
0860	05952		TEMP MULCH	1,115,078.00	SQYD		$	
0870	05953		TEMP SEEDING AND PROTECTION	836,309.00	SQYD		$	
0880	05963		INITIAL FERTILIZER	173.00	TON		$	
0890	05964		MAINTENANCE FERTILIZER	87.00	TON		$	
0900	05985		SEEDING AND PROTECTION	1,017,445.00	SQYD		$	
0910	05992		AGRICULTURAL LIMESTONE	1,037.00	TON		$	
0920	06401		FLEXIBLE DELINEATOR POST-M/W	146.00	EACH		$	
0930	06404		FLEXIBLE DELINEATOR POST-M/Y	108.00	EACH		$	
0940	06510		PAVE STRIPING-TEMP PAINT-4 IN	62,500.00	LF		$	
0950	06511		PAVE STRIPING-TEMP PAINT-6 IN	513,050.00	LF		$	
0960	06514		PAVE STRIPING-PERM PAINT-4 IN	14,390.00	LF		$	
0970	06540		PAVE STRIPING-THERMO-4 IN W (REVISED: 9-11-20)	7,920.00	LF		$	
0980	06541		PAVE STRIPING-THERMO-4 IN Y (REVISED: 9-11-20)	7,815.00	LF		$	
0990	06546		PAVE STRIPING-THERMO-12 IN W	4,010.00	LF		$	
1000	06547		PAVE STRIPING-THERMO-12 IN Y	310.00	LF		$	
1010	06550		PAVE STRIPING-TEMP REM TAPE-W	25,120.00	LF		$	
1020	06551		PAVE STRIPING-TEMP REM TAPE-Y	26,120.00	LF		$	
1030	06556		PAVE STRIPING-DUR TY 1-6 IN W	1,444.00	LF		$	
1040	06557		PAVE STRIPING-DUR TY 1-6 IN Y	1,050.00	LF		$	
1050	06568		PAVE MARKING-THERMO STOP BAR-24IN	355.00	LF		$	
1060	06574		PAVE MARKING-THERMO CURV ARROW	123.00	EACH		$	
1070	06588		PAVEMENT MARKER TY IVA-BY TEMP	434.00	EACH		$	
1080	08100		CONCRETE-CLASS A (FOR PIPE COLLARS)	59.43	CUYD		$	
1090	08150		STEEL REINFORCEMENT	447.00	LB		$	
1110	08903		CRASH CUSHION TY VI CLASS BT TL3	2.00	EACH		$	
1120	10020NS		FUEL ADJUSTMENT	805,043.00	DOLL	$1.00	$	$805,043.00
1130	10030NS		ASPHALT ADJUSTMENT	583,930.00	DOLL	$1.00	$	$583,930.00
1140	20000ES724		TREE	1,070.00	EACH		$	
1150	20001ES724		SHRUB	416.00	EACH		$	
1160	20100ES842		PAVE MARK TEMP PAINT LINE ARROW	50.00	EACH		$	
1170	20191ED		OBJECT MARKER TY 3	29.00	EACH		$	
1180	21430ES508		CONC MEDIAN BARRIER TYPE 12C(50)	546.50	LF		$	
1190	23010EN		PAVE MARK TEMP PAINT STOP BAR-24 IN	1,236.00	LF		$	
1200	23260EC		PAVE MARK-THERMO-24 IN Y	2,718.00	LF		$	
1210	23274EN11F		TURF REINFORCEMENT MAT 1	2,334.00	SQYD		$	
1220	23484EC		PIPE LINER ACCEPTANCE TESTING	1.00	LS		$	
1230	23607EC		PAVE MARK THERMO-LANE REDUCTION ARROW	3.00	EACH		$	
1240	24489EC		INLAID PAVEMENT MARKER	2,228.00	EACH		$	
1250	24679ED		PAVE MARK THERMO CHEVRON	455.00	SQFT		$	

PROPOSAL BID ITEMS

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1260	24768EC		LANE SEPARATOR CURB	140.00	LF		$	
1270	24814EC		PIPELINE INSPECTION	6,808.00	LF		$	
1280	24862EC		PVC FOLD AND FORM PIPE LINER-18 IN (REVISED: 9-11-20)	223.00	LF		$	
1290	24863EC		PVC FOLD AND FORM PIPE LINER-24 IN	239.00	LF		$	
1300	24864EC		PVC FOLD AND FORM PIPE LINER-30 IN	109.00	LF		$	
1310	24865EC		PVC FOLD AND FORM PIPE LINER-36 IN	653.00	LF		$	
1320	25008EC		PAVE STRIPING-THERMO-6 IN W-WET REFLECT	83,374.00	LF		$	
1330	25009EC		PAVE STRIPING-THERMO-6 IN Y-WET REFLECT	87,516.00	LF		$	
1340	25019EC		GROOVE FOR PAVE STRIPING - 7 IN	155,657.00	LF		$	
1350	25100ED		CONSTRUCTED RIFFLES	2,415.00	SQYD		$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1360	00441		ENTRANCE PIPE-18 IN	248.00	LF		$	
1370	00443		ENTRANCE PIPE-24 IN (REVISED: 9-11-20)	252.00	LF		$	
1380	00445		ENTRANCE PIPE-30 IN	134.00	LF		$	
1390	00462		CULVERT PIPE-18 IN	564.00	LF		$	
1400	00464		CULVERT PIPE-24 IN	2,044.00	LF		$	
1410	00466		CULVERT PIPE-30 IN	198.00	LF		$	
1420	00468		CULVERT PIPE-36 IN	302.00	LF		$	
1430	00470		CULVERT PIPE-48 IN (REVISED: 9-11-20)	98.00	LF		$	
1440	00471		CULVERT PIPE-54 IN	188.00	LF		$	
1450	00472		CULVERT PIPE-60 IN	1,061.00	LF		$	
1460	00521		STORM SEWER PIPE-15 IN	1,270.00	LF		$	
1470	00522		STORM SEWER PIPE-18 IN	111.00	LF		$	
1480	00526		STORM SEWER PIPE-30 IN	937.00	LF		$	
1490	01204		PIPE CULVERT HEADWALL-18 IN	12.00	EACH		$	
1500	01208		PIPE CULVERT HEADWALL-24 IN	19.00	EACH		$	
1510	01210		PIPE CULVERT HEADWALL-30 IN	5.00	EACH		$	
1520	01212		PIPE CULVERT HEADWALL-36 IN	8.00	EACH		$	
1530	01216		PIPE CULVERT HEADWALL-48 IN	6.00	EACH		$	
1540	01220		PIPE CULVERT HEADWALL-60 IN	6.00	EACH		$	
1550	01451		S & F BOX INLET-OUTLET-24 IN	3.00	EACH		$	
1560	01452		S & F BOX INLET-OUTLET-30 IN	2.00	EACH		$	
1570	01453		S & F BOX INLET-OUTLET-36 IN	1.00	EACH		$	
1580	01456		CURB BOX INLET TYPE A	7.00	EACH		$	
1590	01487		CURB BOX INLET TYPE F	1.00	EACH		$	
1600	01490		DROP BOX INLET TYPE 1	2.00	EACH		$	
1610	01493		DROP BOX INLET TYPE 2	1.00	EACH		$	
1620	01505		DROP BOX INLET TYPE 5B	5.00	EACH		$	
1630	01511		DROP BOX INLET TYPE 5D	5.00	EACH		$	
1640	01517		DROP BOX INLET TYPE 5F	4.00	EACH		$	
1650	01608		CONC MED BARR BOX INLET TY 12B1	5.00	EACH		$	
1660	01650		JUNCTION BOX	6.00	EACH		$	

PROPOSAL BID ITEMS

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1670	01756		MANHOLE TYPE A	2.00	EACH		$	
1680	01767		MANHOLE TYPE C	1.00	EACH		$	
1685	23124EN		BORE AND JACK PIPE-48 IN (ADDED: 9-11-20)	153.00	LF		$	
1690	23952EC		DRAINAGE JUNCTION BOX TY B	2.00	EACH		$	
1700	24026EC		PIPE CULVERT HEADWALL-54 IN	4.00	EACH		$	
1710	25116EC		BORE AND JACK PIPE-54 IN	68.00	LF		$	

Section: 0004 - BRIDGE - #28314 - KY 461 STA 142+27.90 (TWIN)

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1720	02231		STRUCTURE GRANULAR BACKFILL	1,812.00	CUYD		$	
1730	02998		MASONRY COATING	5,090.00	SQYD		$	
1740	03299		ARMORED EDGE FOR CONCRETE	313.00	LF		$	
1750	08002		STRUCTURE EXCAV-SOLID ROCK	582.00	CUYD		$	
1760	08003		FOUNDATION PREPARATION (#28314)	1.00	LS		$	
1770	08020		CRUSHED AGGREGATE SLOPE PROT	1,236.00	TON		$	
1780	08033		TEST PILES	156.00	LF		$	
1790	08039		PRE-DRILLING FOR PILES	150.00	LF		$	
1800	08046		PILES-STEEL HP12X53	2,669.00	LF		$	
1810	08094		PILE POINTS-12 IN	96.00	EACH		$	
1820	08100		CONCRETE-CLASS A	1,483.50	CUYD		$	
1830	08104		CONCRETE-CLASS AA	1,675.80	CUYD		$	
1840	08150		STEEL REINFORCEMENT	184,766.00	LB		$	
1850	08151		STEEL REINFORCEMENT-EPOXY COATED	551,584.00	LB		$	
1860	08160		STRUCTURAL STEEL (1,905,110 LBS)	1.00	LS		$	
1870	08170		SHEAR CONNECTORS (16,650)	1.00	LS		$	
1880	08269		ELECTRICAL CONDUIT (#28314)	1.00	LS		$	
1890	25028ED		RAIL SYSTEM SINGLE SLOPE - 40 IN	2,100.00	LF		$	

Section: 0005 - BRIDGE - #28315 - COIN ROAD STA 50+00

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1900	02231		STRUCTURE GRANULAR BACKFILL	343.00	CUYD		$	
1910	02998		MASONRY COATING	1,334.00	SQYD		$	
1920	03299		ARMORED EDGE FOR CONCRETE	99.50	LF		$	
1930	08002		STRUCTURE EXCAV-SOLID ROCK	41.00	CUYD		$	
1940	08003		FOUNDATION PREPARATION (28315)	1.00	LS		$	
1950	08020		CRUSHED AGGREGATE SLOPE PROT	240.00	TON		$	
1960	08033		TEST PILES	41.00	LF		$	
1970	08046		PILES-STEEL HP12X53	250.00	LF		$	
1980	08094		PILE POINTS-12 IN	18.00	EACH		$	
1990	08100		CONCRETE-CLASS A	371.50	CUYD		$	
2000	08104		CONCRETE-CLASS AA	377.60	CUYD		$	

PROPOSAL BID ITEMS

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2010	08150		STEEL REINFORCEMENT	52,361.00	LB		$	
2020	08151		STEEL REINFORCEMENT-EPOXY COATED	125,562.00	LB		$	
2030	08269		ELECTRICAL CONDUIT (COIN ROAD)	1.00	LS		$	
2040	08633		PRECAST PC I BEAM TYPE 3	1,126.50	LF		$	
2050	25028ED		RAIL SYSTEM SINGLE SLOPE - 40 IN	458.50	LF		$	

Section: 0006 - BRIDGE - #28316 - MARK SHOPVILLE ROAD

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2060	02231		STRUCTURE GRANULAR BACKFILL	246.00	CUYD		$	
2070	02998		MASONRY COATING	1,276.60	SQYD		$	
2080	03299		ARMORED EDGE FOR CONCRETE	85.00	LF		$	
2090	08002		STRUCTURE EXCAV-SOLID ROCK	74.00	CUYD		$	
2100	08003		FOUNDATION PREPARATION (MARK SHOPVILLE ROAD)	1.00	LS		$	
2110	08019		CYCLOPEAN STONE RIP RAP	1,280.00	TON		$	
2120	08033		TEST PILES	51.00	LF		$	
2130	08046		PILES-STEEL HP12X53	371.00	LF		$	
2140	08094		PILE POINTS-12 IN	20.00	EACH		$	
2150	08100		CONCRETE-CLASS A	247.10	CUYD		$	
2160	08104		CONCRETE-CLASS AA	301.10	CUYD		$	
2170	08150		STEEL REINFORCEMENT	41,502.00	LB		$	
2180	08151		STEEL REINFORCEMENT-EPOXY COATED	103,673.00	LB		$	
2190	08634		PRECAST PC I BEAM TYPE 4	877.00	LF		$	
2200	25028ED		RAIL SYSTEM SINGLE SLOPE - 40 IN	448.50	LF		$	

Section: 0007 - BRIDGE - #28317 - KY 461 OVER FLAT LICK CREEK - RCBC STA 169+34 T

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2210	02403		REMOVE CONCRETE MASONRY	173.00	CUYD		$	
2220	08002		STRUCTURE EXCAV-SOLID ROCK	64.00	CUYD		$	
2230	08003		FOUNDATION PREPARATION (KY 461 - STA 169+34)	1.00	LS		$	
2240	08100		CONCRETE-CLASS A	608.60	CUYD		$	
2250	08150		STEEL REINFORCEMENT	90,660.00	LB		$	
2260	23931EC		EPS FOAM BLOCK	220,711.00	CUFT		$	

Section: 0008 - BRIDGE - #28318 - KY 461 OVER UNNAMED STREAM - RCBC STA 210+92

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2270	02403		REMOVE CONCRETE MASONRY	22.00	CUYD		$	
2280	08002		STRUCTURE EXCAV-SOLID ROCK	122.00	CUYD		$	
2290	08003		FOUNDATION PREPARATION (KY 461 - STA 210+92)	1.00	LS		$	
2300	08100		CONCRETE-CLASS A	130.30	CUYD		$	
2310	08150		STEEL REINFORCEMENT	7,838.00	LB		$	

Section: 0009 - BRIDGE - #28319 - KY 461 OVER UNNAMED STREAM - RCBC STA 242+35

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2320	02403		REMOVE CONCRETE MASONRY	28.00	CUYD		$	
2330	08002		STRUCTURE EXCAV-SOLID ROCK	34.00	CUYD		$	
2340	08003		FOUNDATION PREPARATION (KY 461 - STA 242+35)	1.00	LS		$	
2350	08100		CONCRETE-CLASS A	72.70	CUYD		$	
2360	08150		STEEL REINFORCEMENT	7,071.00	LB		$	

Section: 0010 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2370	06400		GMSS GALV STEEL TYPE A	4,513.00	LB		$	
2380	06405		SBM ALUMINUM PANEL SIGNS	2,330.00	SQFT		$	
2390	06406		SBM ALUM SHEET SIGNS .080 IN	932.00	SQFT		$	
2400	06407		SBM ALUM SHEET SIGNS .125 IN	1,127.00	SQFT		$	
2410	06410		STEEL POST TYPE 1	4,675.00	LF		$	
2420	06424		OSS ALUMINUM 65 FT TRUSS	1.00	EACH		$	
2435	06436		OSS ALUMINUM 75 FT TRUSS (ADDED: 9-22-20)	1.00	EACH		$	
2440	06441		GMSS GALV STEEL TYPE C	6,921.00	LB		$	
2445	06445		OSS ALUMINUM 90 FT TRUSS (ADDED: 9-22-20)	1.00	EACH		$	
2460	06490		CLASS A CONCRETE FOR SIGNS	109.80	CUYD		$	
2470	06491		STEEL REINFORCEMENT FOR SIGNS	7,498.00	LB		$	
2480	20419ND		ROADWAY CROSS SECTION	11.00	EACH		$	
2490	20912ND		BARRIER WALL POST	3.00	EACH		$	
2500	21596ND		GMSS TYPE D	8.00	EACH		$	
2510	24631EC		BARCODE SIGN INVENTORY	102.00	EACH		$	

Section: 0011 - LIGHTING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2520	04714		POLE 120 FT MTG HT HIGH MAST	15.00	EACH		$	
2530	04761		LIGHTING CONTROL EQUIPMENT	3.00	EACH		$	
2540	04797		CONDUIT-3 IN	2,490.00	LF		$	
2550	04800		MARKER	33.00	EACH		$	
2560	04820		TRENCHING AND BACKFILLING	10,158.00	LF		$	
2570	04860		CABLE-NO. 8/3C DUCTED	5,700.00	LF		$	
2580	04861		CABLE-NO. 6/3C DUCTED	5,105.00	LF		$	
2590	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	6.00	EACH		$	
2600	20392NS835		ELECTRICAL JUNCTION BOX TYPE C	12.00	EACH		$	
2610	21543EN		BORE AND JACK CONDUIT	660.00	LF		$	
2620	23161EN		POLE BASE-HIGH MAST	134.30	CUYD		$	
2630	24749EC		HIGH MAST LED LUMINAIRE	88.00	EACH		$	
2640	24851EC		CABLE-NO. 10/3C DUCTED	8,040.00	LF		$	

Section: 0012 - INTELLIGENT TRANSPORTATION SYSTEMS

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2650	04792		CONDUIT-1 IN	90.00	LF		$	
2660	04795		CONDUIT-2 IN	90.00	LF		$	
2670	04797		CONDUIT-3 IN	60.00	LF		$	
2680	04820		TRENCHING AND BACKFILLING	850.00	LF		$	
2690	04835		WIRE-NO. 4	3,530.00	LF		$	
2700	04899		ELECTRICAL SERVICE	3.00	EACH		$	
2710	06400		GMSS GALV STEEL TYPE A	3,486.00	LB		$	
2720	06490		CLASS A CONCRETE FOR SIGNS	7.08	CUYD		$	
2730	20257NC		SITE PREPARATION (KY461 SOUTHBOUND)	1.00	LS		$	
2740	20257NC		SITE PREPARATION (KY80 EASTBOUND)	1.00	LS		$	
2750	20257NC		SITE PREPARATION (KY80 WESTBOUND)	1.00	LS		$	
2760	20257NC		SITE PREPARATION (WEB CAMERA LOCATION INTERCHANGE)	1.00	LS		$	
2770	20390NS835		INSTALL COORDINATING UNIT	7.00	EACH		$	
2780	20392NS835		ELECTRICAL JUNCTION BOX TYPE C	2.00	EACH		$	
2790	20419ND		ROADWAY CROSS SECTION	3.00	EACH		$	
2800	21065ND		MODEL 334 ENCLOSURE	1.00	EACH		$	
2810	21066ND		MODEL 336 ENCLOSURE	5.00	EACH		$	
2820	21069ND		SURGE DEVICE 120 VOLT	4.00	EACH		$	
2830	21071ND		DATA SURGE DEVICE	10.00	EACH		$	
2840	21076ND		FIBER TERMINATION RACK	8.00	EACH		$	
2850	21077ED		FIBER OPTIC CABLE	1,125.00	LF		$	
2860	21079ND		TRANSFORMER 480/120	1.00	EACH		$	
2870	21458ND		FIBER TRANSCEIVER SIGN	11.00	EACH		$	
2880	21489ND		RACK MOUNTED UPS	6.00	EACH		$	
2890	21543EN		BORE AND JACK CONDUIT	60.00	LF		$	
2900	22403NN		WEB CAMERA ASSEMBLY	1.00	EACH		$	
2910	22408NN		VARIABLE MESSAGE SIGN-DYNAMIC SIDE MOUNT	3.00	EACH		$	
2920	23150NN		COMMUNICATION CABLE	150.00	LF		$	
2930	23151NN		POLE WITH LOWERING DEVICE	1.00	EACH		$	
2940	23157EN		TRAFFIC SIGNAL POLE BASE	4.32	CUYD		$	
2950	23941EC		VIDEO SURVEILLANCE CONTROLLER	1.00	EACH		$	
2960	23942EC		FIXED WEB CAMERA ASSEMBLY	3.00	EACH		$	
2970	23944EC		ADVANCED GROUNDING SYSTEM	9.00	EACH		$	
2980	24601EC		INSTALL (TYPE ATC CONTROLLER)	7.00	EACH		$	
2990	24851EC		CABLE-NO. 10/3C DUCTED	750.00	LF		$	
3000	24901EC		PVC CONDUIT-2 IN-SCHEDULE 80	1,180.00	LF		$	

Section: 0013 - TRAINEES

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT

201305

PROPOSAL BID ITEMS

Report Date 9/22/20

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3010	02742		TRAINEE PAYMENT REIMBURSEMENT (1 - GROUP 2, 3 OR 4 OPERATOR)	1,400.00	HOUR		$	
3020	02742		TRAINEE PAYMENT REIMBURSEMENT (1 - GROUP 2, 3 OR 4 OPERATOR)	1,400.00	HOUR		$	
3030	02742		TRAINEE PAYMENT REIMBURSEMENT (1 - IRONWORKER)	1,400.00	HOUR		$	

Section: 0014 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3040	02568		MOBILIZATION	1.00	LS		$	
3050	02569		DEMOBILIZATION	1.00	LS		$	