TEAM KENTUCKY
TRANSPORTATION CABINET

CALL NO. 302

CONTRACT ID. 261517

LAUREL COUNTY

FED/STATE PROJECT NUMBER FD06/FD59 063 0025 009-011

DESCRIPTION US HIGHWAY 25

WORK TYPE ASPHALT SURFACE WITH GRADE & DRAIN

PRIMARY COMPLETION DATE 6/30/2029

LETTING DATE: August 20,2026

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN DAYLIGHT TIME August 20,2026. Bids will be publicly announced at 10:00 AM EASTERN DAYLIGHT TIME.

PLANS AVAILABLE FOR THIS PROJECT.

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

TABLE OF CONTENTS

PART I SCOPE OF WORK

- PROJECT(S), COMPLETION DATE(S), & LIQUIDATED DAMAGES
- CONTRACT NOTES
- STATE CONTRACT NOTES
- INCIDENTAL SURFACING
- ASPHALT PAVEMENT RIDE QUALITY CAT B
- FUEL AND ASPHALT PAY ADJUSTMENT
- COMPACTION OPTION A
- MATERIAL TRANSFER VEHICLE (MTV)
- SPECIAL NOTE(S) APPLICABLE TO PROJECT
- TREE REMOVAL
- PIPELINE INSPECTION
- ELECTRONIC DELIVERY MANAGEMENT SYSTEM (E-TICKETING) ASPHALT
- ELECTRONIC DELIVERY MANAGEMENT SYSTEM (E-TICKETING) AGGREGATE
- EXPERIMENTAL KYCT AND HAMBURG TESTING
- DOLOMITIC POLISH-RESISTANT AGGREGATE CLASS A 0.38-IN AND 0.50-IN NOMINAL ASPHALT MIXTURES
- RECYCLED ASPHALT PAVEMENT (RAP) STOCKPILE MANAGEMENT
- INSTALLATION OF TRAFFIC COUNTING INDUCTANCE LOOPS
- RIGHT OF WAY CERTIFICATION
- UTILITY IMPACT & RAIL CERTIFICATION NOTES
- GENERAL UTILITY NOTES
- UTILITY SPECIFICATIONS
- DEPT OF ARMY - NATIONWIDE PERMIT
- WATER QUALITY CERTIFICATION
- KPDES STORM WATER PERMIT, BMP AND ENOI
- COMMUNICATING ALL PROMISES
- GUARDRAIL DELIVERY VERIFICATION SHEET

PART II SPECIFICATIONS AND STANDARD DRAWINGS

- STANDARD AND SUPPLEMENTAL SPECIFICATIONS
- [SN-1I] PORTABLE CHANGEABLE MESSAGE SIGNS
- [SN-11F] TURF REINFORCEMENT MAT
- [SN-11M] BARCODE LABEL ON PERMANENT SIGNS
- [SN-11N] LONGITUDINAL PAVEMENT JOINT ADHESIVE

PART III EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

- LABOR AND WAGE REQUIREMENTS
- EXECUTIVE BRANCH CODE OF ETHICS
- KENTUCKY EQUAL EMPLOYMENT OPPORTUNITY ACT OF 1978 LOCALITY / STATE
- PROJECT WAGE RATES / STATE FUNDED

PART IV BID ITEMS

PART I

SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 11

CONTRACT ID - 261517

FD06/FD59 063 0025 009-011

COUNTY - LAUREL

PCN - DE06300252612
FD06 063 0025 009-011

US HIGHWAY 25 US 25 CONGESTION RELIEF AND WIDENING, A DISTANCE OF 01.94 MILES.ASPHALT SURFACE WITH GRADE & DRAIN SYP NO. 11-00147.00.

GEOGRAPHIC COORDINATES LATITUDE 37:06:14.00 LONGITUDE 84:03:46.00

ADT 20,692

COMPLETION DATE(S):

COMPLETED BY 05/01/2027	APPLIES TO MILESTONE 1 - SEE MOT PLAN NOTES
COMPLETED BY 06/30/2029	APPLIES TO ENTIRE CONTRACT
COMPLETED BY 07/01/2028	APPLIES TO MILESTONE 3 - SEE MOT PLAN NOTES
COMPLETED BY 11/30/2027	APPLIES TO MILESTONES 2A & 2B - SEE MOT PLAN NOTES

CONTRACT NOTES

INSURANCE

Refer to Kentucky Standard Specifications for Road and Bridge Construction, current edition.

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 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/construction-procurement). 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 state agency certifies that it is in compliance with the provisions of KRS 45A.150, "Access to contractor's books, documents, papers, records, or other evidence directly pertinent to the contract." The Contractor, as defined in KRS 45A.030, 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 agreement for the purpose of financial audit or program review. 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. Records and other prequalification information confidentially disclosed as part of the bid process shall not be deemed as directly pertinent to the agreement and shall be exempt from disclosure as provided in KRS 61.878(1)(c).

BOYCOTT PROVISIONS

If applicable, the contractor represents that, pursuant to KRS 45A.607, they are not currently engaged in, and will not for the duration of the contract engage in, the boycott of a person or an entity based in or doing business with a jurisdiction with which Kentucky can enjoy open trade. **Note:** The term Boycott does not include actions taken for bona fide business or economic reasons, or actions specifically required by federal or state law.

If applicable, the contractor verifies that, pursuant to KRS 41.480, they do not engage in, and will not for the duration of the contract engage in, in energy company boycotts as defined by KRS 41.472.

LOBBYING PROHIBITIONS

The contractor represents that they, and any subcontractor performing work under the contract, have not violated the agency restrictions contained in KRS 11A.236 during the previous ten (10) years, and pledges to abide by the restrictions set forth in such statute for the duration of the contract awarded.

The contractor further represents that, pursuant to KRS 45A.328, they have not procured an original, subsequent, or similar contract while employing an executive agency lobbyist who was convicted of a crime related to the original, subsequent, or similar contract within five (5) years of the conviction of the lobbyist.

SPECIAL NOTE FOR RECIPROCAL PREFERENCE

RECIPROCAL PREFERENCE TO BE GIVEN BY PUBLIC AGENCIES TO RESIDENT BIDDERS

By reference, KRS 45A.490 to 45A.494 are incorporated herein and in compliance regarding the bidders residency. Bidders who want to claim resident bidder status should complete the Affidavit for Claiming Resident Bidder Status along with their bid in the electronic bidding software. Submittal of the Affidavit should be done along the bid in Bid Express.

April 30, 2018

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.

ASPHALT PAVEMENT RIDE QUALITY CATEGORY B

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

FUEL AND ASPHALT PAY ADJUSTMENT

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

OPTION A

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

MATERIAL TRANSFER VEHICLE (MTV)

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

Laurel County US 25
Item Nos. 11-147.00, 11-20038.00
April 15, 2026

SPECIAL NOTE FOR BREAKING and SEATING PAVEMENT (MODIFIED RUBBLIZATION) OF PORTLAND CEMENT CONCRETE PAVEMENT

DESCRIPTION: Break and seat existing JPC pavement for full depth and full panel width. The existing pavement is a previously unbroken PCC pavement. Breaking & Seating operations are herein referred to as Breaking & Seating (Modified Rubblization) Pavement in this note and the plan sheets. The work required by this special note shall include recycling in-place the existing PCC pavement into a coarse aggregate base course, by breaking in-place with mechanical equipment and compacting and preparing the base to receive the asphalt concrete. Contrary to Section 504 of the Standard Specifications for Road and Bridge Construction, current edition, procedures, and processes for breaking and seating (modified rubblization) pavement presented in this note shall apply for this work unless addressed otherwise in the plans and bidding documents.

CONSTRUCTION REQUIREMENTS

MATERIALS AND EQUIPMENT.

Breaking Equipment. Breaking equipment shall be in accordance with requirements presented herein, except other types of equipment may be used if approved by the Engineer. The Engineer will determine if the proposed equipment has demonstrated that the pavement can be broken to the extent specified without excessive displacement of the concrete or damage to the subgrade.

Impact Hammer. Break the pavement with an impact hammer capable of delivering sufficient energy to break the pavement. Furnish a hammer having a breaker equipped with a plate-type shoe designed to prevent penetration into the existing surface. The Department may approve other equipment according to Section 108. When necessary, provide a screen for the hammer to protect vehicles in the adjacent lane from flying concrete chips during the breaking process.

Pneumatic-Tire Proof Roller. Furnish a pneumatic-tire proof roller, weighing a minimum of 35 tons, of one of the following types.

A roller having the following:

1) 4 rubber-tired wheels equally spaced across the full width and mounted in line on a rigid steel frame in such manner that all wheels carry equal loads, regardless of surface irregularities.

2) Roller tires capable of satisfactory operation at a minimum inflation pressure of 100 psi when inflated to the pressure necessary to obtain proper surface contact. pressure to satisfactorily seat pavement slabs. The Department will allow tires to contain liquid.
3) A rubber-tired prime mover for towing.
or
1) Two axles.
2) Self-propelled.
3) No more than 7 tires.
4) Tires capable of meeting inflation pressure and surface contact pressure requirements in 2) above.

CONSTRUCTION. Break and seat the existing pavement. Place specified succeeding leveling, asphalt base, and asphalt binder courses one lane at a time. Furnish and place asphalt mixtures according to Division 400 for the appropriate mixture. Exercise care during breaking and seating to prevent damage to underground utilities and drainage facilities. Where the broken and seated pavement abuts concrete pavement that is to remain intact a joint shall be saw cut full depth and load transfer devices severed at all termini prior to breaking and seating. For jointed pavements, this saw cut should be at an existing joint.

Breaking of JPC Pavement.
Size Requirements. Break the existing JPC pavement to the extent that no more than 20 percent of the broken fragments are larger than 2 feet, and no individual fragments are larger than 30 inches. Determine the extent of the breakage based on cracks visible to unaided normal vision when the pavement surface is dry. Do not use water to detect additional cracks. Accomplish breaking uniformly to produce the desired size without displacing the concrete more than 1/2 inch vertically above the original JPC pavement surface elevation. Continuously monitor the breaking operation. Make adjustments in the striking pattern, striking energy, number of passes, or other factors to continually achieve acceptable breaking throughout the project.

Test Section. Before breaking operations begin, the Engineer will designate a test section. Break the test section using varying energy and striking patterns. When necessary, repeat passes of the equipment over the pavement until the test section is acceptably broken according to requirements above. Use the extent of breakage of the test section as a guide for breaking the pavement on the remainder of the project. The Engineer may require additional test sections at any time during the course of the work when sizes do not conform to the size requirements described above.

Seating of Broken JPC Pavement. After breaking, seat the broken concrete by rolling with a pneumatic-tire proof roller. Make at least 5 one-way passes with a minimum 50-ton roller, or 7 one-way passes with a minimum 35-ton roller. Use a rolling pattern that will ensure that the entire area of the broken pavement is well seated and is thoroughly and

uniformly compacted. Remove any large rocking fragments and fragments that are displaced more than 1/2 inch above the original pavement surface elevation after seating and fill the resulting void with asphalt and compact or tamp.

Placement of Edge Drains. When the Contract includes installation of pavement edge drains, install the edge drains at least 2 weeks before breaking and seating operations.

Placement of Asphalt. Sweep the broken and seated pavement clean of foreign material using mechanical sweepers and hand brooms. Place the asphalt base following the breaking and seating operation as closely as practical according to requirements of Section 403. Do not allow the broken pavement to remain exposed for more than 24 hours. If the broken pavement is exposed more than 24 hours, suspend the breaking operations until all broken existing pavement has been covered by at least one course of asphalt base. Make any required changes to the cross slope with the paving of the base courses. Cure the first course of base at least 8 hours before placing the second course. Do not open a lane to public traffic until 2 courses of asphalt (not including leveling courses) are in place. Offset the longitudinal joints in the asphalt 6 inches according to Section 403. Perform leveling and wedging according to Section 403 on the top of the first course of asphalt, and not on the existing pavement. However, at specific locations where the Engineer deems a substantial amount of leveling is necessary, level and wedge directly on the broken and seated pavement. Correct deviations in the surface by leveling and wedging on each succeeding course unless the Engineer directs or approves in writing that the leveling and wedging be delayed until after placing the succeeding courses. Construct asphalt courses succeeding the first 2 courses according to the Contract.

Any damage to pipes, valve boxes, manholes, or other fixtures, resulting from the breaking and seating effort shall be repaired or replaced, as approved by the engineer, at the contractor’s expense. The contractor has the option of using an alternative method for breaking and seating adjacent to fixtures or above pipe. In lieu of breaking and seating, the pavement adjacent to fixtures or above pipe may be removed and the resulting void filled with filler aggregate.

MEASUREMENT.

Breaking and Seating Pavement. The Department will measure the quantity in square yards. The Department will measure the width as the actual width of the original JPC pavement, and the length as the horizontal length along the centerline of each roadway or ramp. The entire area of existing PCC pavement acceptably recycled in-place by breaking and seating as specified herein will be measured in square yards.

Leveling and Wedging. The Department will measure quantity according to Section 403.

Asphalt Mixtures. The Department will measure quantity according to Section 403 for the appropriate mixture.

PAYMENT.

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

Payment for Breaking & Seating Pavement at the contract unit price per square yard for Rubblizing Pavement shall be full compensation for all work necessary to acceptably break the existing pavement and compact the recycled pavement. This price will also be payment in full for any pre-treatment of the pavement, if required; dust abatement; pavement removals adjacent to fixtures or above pipes; removing exposed reinforcement steel; disposal of all removed material as part of the breaking and seating effort; maintaining the compacted and stabilized condition of the broken and seated pavement until overlaid with base course or pavement; and for all labor, tools and equipment necessary to complete the work.

Code	Pay Item	Pay Unit
02108	Rubblize (Breaking and Seating) Pavement	Square Yard
----	Leveling and Wedging	Section 403
----	Asphalt Mixtures	Section 403

SPECIAL NOTE

Hazardous Materials

Laurel County
US-25 congestion relief and widening, and new connector from US-25 to KY-229.
Item No. 11-147

Should suspect petroleum contaminated soils be encountered during excavation/construction they should not be reused or discarded without KYTC authorization. The Contractor shall immediately contact KYTC Division of Environmental Analysis (DEA), (Brittany Lowry) at (502) 564-7250. KYTC DEA will coordinate with a UST/Hazmat Statewide Contractor to assist the contractor in characterizing the soil and/or groundwater for removal/disposal of contaminated material. The contractor may coordinate to work in other areas until the material is removed. Parcels that KYTC has identified but is not limited to potential contamination are P-124, P-224, P-226, and P-230.

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 CONCRETE SEALING

These Notes or designated portions thereof, apply where so indicated on the plans, proposals or bidding instruction.

I. DESCRIPTION. Perform all work in accordance with the Department's 2019 Standard Specifications, and applicable Supplemental Specifications, the attached sketches, and these Notes. Section references are to the Standard Specifications.
This work consists of: (1) Furnish all labor, materials, tools, and equipment; (2) Clean the concrete (3) Seal the concrete; (4) Maintain & control traffic; and, (5) Any other work specified as part of this contract.

II. MATERIALS.

A. Sealer. Use a sealer from the KYTC list of approved materials.

B. Coverage Rate: Follow all manufacturer's recommendations for coverage rates except the application rate must not exceed the square footage coverage rate per gallon of sealer as given in the chart below. If the manufacturer recommends a coverage rate greater than given in the table below, apply sealer at the rate given in the table below for the chosen sealers silane percentage.

% Silane	Coverage rate (ft^2/gallon)
100	300
40	120
20	60

III. CONSTRUCTION.

A. Curing Compound. Contrary to Section 609.03.12 of the specifications, curing compound is not to be used on the deck due to potentially causing issues with the concrete sealer. During the deck pour, finishing, and tining operations the Class AA concrete shall be kept continuously moist with the use of a mister until burlap or curing blankets are applied to the surface. At no point should water be pooling or running off the surface or the surface of the concrete be allowed to become dry. After the burlap or curing blankets are installed, cure in accordance with the specifications. Include all costs in the unit price bid for Class AA concrete. Failure to properly cure the concrete in accordance with this note and the specifications may result in weakened or cracked concrete. If the concrete is weakened or cracked due to improper curing, the contractor will be responsible for providing alternates to fix the

issues to the Engineer for review and the contractor will be solely responsible for all costs to do so, up to complete replacement. Do not begin any construction on fixing any issues without approval of the Engineer.

B. Apply Ordinary Surface Finish. All concrete surfaces not required to have concrete sealer, in accordance to this special note, or a floated surface finish, should receive Ordinary Surface Finish in accordance with Section 601.03.18 of the Standard Specifications.

C. Application Limits:

1. Every exposed surface above a point 6" below ground or fill line of abutments, wing walls, retaining walls, sound barrier walls, end bent and pier caps, pedestals, back walls, columns, web walls, and exposed footings.
2. All exposed surfaces of concrete deck, barrier walls, parapets, curbs, and plinths.
3. Prestressed Concrete I-Girders, Concrete Beams, and Spread Prestressed Concrete Box Beams: The underneath surfaces of slab overhangs outside of exterior concrete girders and to the exterior side and bottom of exterior concrete girders and beams.
4. Adjacent Prestressed Concrete Composite Box Beams: Full length of the exterior face of all exterior beams from the top of the box beam to 1'-0" underneath the beams.
5. Prestressed Non-Composite Box Beams: All faces of all beams, excluding surfaces to be covered with a waterproofing membrane. Take care to ensure that the grout pockets are not sealed.
6. If the contract documents include the Special Note for Concrete Coating, do not apply concrete sealer to the areas where Concrete Coating is specified.

D. Contract Time. Concrete Sealing may need to be installed after contract time has elapsed in a separate mobilization and after the Engineer has declared the project otherwise complete. Liquidated damages shall not be charged provided Concrete Sealing is complete within 60 days after the last concrete pour on the structure. When the Contractor has not completed Concrete Sealing within the time frame allotted, Liquidated Damages shall be charged at 25 percent of the original contract daily charge from the expiration of the time allowed until the Contractor completes the work except the Department will not deduct liquated damages when weather limitations prohibit the Contractor from performing the work.

E. Cleaning the Concrete. Dry clean the concrete to remove all loose debris. Remove all visible hydrocarbons from the surface with detergent approved by the manufacturer of the concrete sealant. Pressure wash all surfaces to be

sealed at 2000 to 3000 psi. Install pressure gauges at each wand to verify pressure. Use 30° fan tip or as recommended by the manufacturer of the concrete sealant. Hold pressure washing wand a minimum of 45° from the concrete with a maximum stand-off distance of 12 inches.

F. Sealing the Concrete. Allow new concrete to cure a minimum 28 days prior to application of sealer. Monitor weather conditions prior to sealer application. Refer to manufacturer's recommendations for proper ambient conditions. Do not apply sealer if precipitation is anticipated within the time stated by the manufacturer. Allow the concrete to dry 24 hours (after washing or rain event) before sealer application. The deck can be reopened to traffic while drying. Sealer must be applied within 48 hours of washing or the concrete must be rewashed. Divide the concrete into predefined areas of specific square footage to aid in determining usage. Comply with manufacturer's usage recommendation. Using a low pressure pump, apply sealer and spread evenly with broom or squeegee; do not allow pooling to remain. When each predefined area is complete, measure the amount of sealer used to verify proper usage. After sealing, follow manufacturer's recommended cure time before opening to traffic. On vertical surfaces, apply the sealer in a flooding application from the bottom up, so the material runs down 6 to 8 inches below the spray pattern.

G. Inspection: Monitor all aspects of the project to assure compliance to this specification. Observe and document general conditions during the entirety of the project. Verify that each phase of work has been satisfactorily completed prior to beginning the next phase. Phases are described as follows:

1. Dry cleaning to remove loose debris, verify and document:
    a. All debris has been removed and disposed of properly.
2. Removal of hydrocarbons, verify and document:
    a. The manufacturer's recommended detergent is used for removal.
    b. Hydrocarbons have been satisfactorily removed.
3. Pressure washing, verify and document:
    a. Washing pressure at the wand.
    b. Tip size used.
    c. Wash angle and stand-off distance.
    d. The concrete is satisfactorily cleaned.
4. Sealer application, verify and document:
    a. Proper cure time for new concrete.
    b. Concrete surface is dry.
        1. Document time since washed.

2. Was deck opened to traffic after washing?

c. Ambient conditions.
   1. Document ambient temperature, surface temperature, relative humidity, and dew point.
d. Application and distribution method.
e. Coverage to be complete and even.
f. Material is not allowed to remain pooled.
g. Monitor material usage.
h. No traffic until proper cure time is allowed.

IV. MEASUREMENT

A. Concrete Sealing. The Department will measure the quantity per square feet of each area sealed.

B. Mobilization – For Concrete Surface Treatment. The Department will pay the lump sum bid for an additional mobilization when Concrete Sealing must be performed after the Engineer has deemed the project complete except for Concrete Sealing, structure is opened to traffic, and Contractor has fully demobilized.

V. PAYMENT

A. **23378EC - Concrete Sealing.** Payment at the contract unit price per square feet is full compensation for the following: (1) Furnish all labor, materials, tools, and equipment; (2) Clean the concrete; (3) Seal the concrete; (4) Maintain & control traffic; and, (5) Any other work specified as part of this contract.

B. **26233EC - Mobilization – For Concrete Surface Treatment – L.S.** Payment at the contract lump sum price bid shall be full compensation for the Contractor to remobilize on the project to perform Concrete Sealing as detailed herein this special note.

February 17, 2022

SPECIAL NOTE FOR FIBER REINFORCEMENT OF ASPHALT

PART 1 – GENERAL

1.1 DESCRIPTION

This Section includes specifications for furnishing all materials, equipment, labor, and incidentals for mixing aramid fiber reinforcements to hot mix asphalt.

1.2 DEFINITIONS

A. HMA - hot mix asphalt, without aramid fiber.
B. WMA- warm mix asphalt, without aramid fiber.
C. Reinforced HMA - hot mix asphalt including aramid fibers properly proportioned, uniformly mixed and coated with asphalt.
D. Aramid fiber - pure aramid fiber meeting the material properties of this specification, without additive materials.
E. Delivery material(s) - the material(s) combined with the pure aramid fiber to facilitate Aramid fiber and HMA/WMA proportioning, uniform mixing with the HMA/WMA, and asphalt coating of the aramid fibers.
F. Aramid product - the aramid supplier's mixture of pure aramid fiber and delivery material(s).
G. Manufacturer - the company that produces the aramid fiber from raw materials.
H. Supplier - the company that offers an aramid product.

PART 2 – PRODUCT

2.1 MATERIALS

Meet the following aramid fiber properties.

Property	Measure	Standard
Material	Aramid	ASTM D276
Form	Monofilament fibers	Manufacturer Certification
Length	0.75-1.50 inches (+/- 10%)	Manufacturer Cert.
Specific Gravity	1.44	ASTM D276
Minimum Tensile Strength	400,000 psi	ASTM D3379
Maximum Tensile Elongation	1.8 %	ASTM D3379
Degradation Temperature	800 degrees F	ASTM D276
Acid and Alkali Resistance	Inert	Manufacturer Cert.

2.2 SUBMITTALS

Submit the following.

A. Identify the mixing plant.
B. Provide a specification sheet from the aramid fiber manufacturer.
C. Provide the following from the aramid product supplier at least three weeks prior to HMA/WMA production.
    1. The supplier's specified mix rate for the aramid product.
    2. Certification that the amount of aramid fiber in the aramid product will be between 2.1 and 4.0

ounces of pure aramid fiber for each ton of hot mix asphalt.

3. Evidence showing how many times, if any, the supplier's fiber product has been successfully produced at the asphalt plant to be used for the project.
4. Proven method of introducing the aramid fibers into the hot mix asphalt which will not cause the aramid fibers to become airborne.

2.3 JOB MIX FORMULA

When aramid fiber is required as a mixture ingredient, modification to the job mix formula is not required.

PART 3 – EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

Store aramid product in a dry environment and do not allow them to be in contact with moisture.

Mix 3.0 ounces (+/- 1.0 ounces) of aramid fibers per ton of asphalt. The weight applied is for pure aramid fibers only, weight of any delivery materials is not considered.

Have a fiber supplier's representative on site during the first day of production mixing. This requirement can be waived if fiber supplier and HMA/WMA producer can supply evidence of supplier's brand of fiber product being successfully produced by the HMA/WMA producer. The fiber supplier's representative may be on site for additional days as requested by the Engineer.

Introduce the aramid product as follows:

1. Batch Plant

   When a batch type plant is used, add the aramid product dosage to the aggregate in the weigh hopper. This may be done with loose fibers and a fiber metering device, or may be done by using manual dosing equipment. If necessary, increase the batch dry mixing time to ensure the aramid fibers are uniformly distributed prior to the injection of asphalt cement into the mixer.

2. Drum Plant

   When a continuous or drier-drum type plant is used, add the aramid product to the RAP material to uniformly disperse with the aggregate and injected asphalt. Use a separate aramid product metering device feed system to proportion by weight of total mix, the required percentage of fiber reinforcement into the mixture. Control the aramid product metering system with a proportioning device to meet the dosing requirements.

   When a continuous or drier-drum type plant is used for limited production volumes, the addition of the aramid product may be done by using manual measuring tools or equipment and adding them directly onto the RAP belt or into the RAP opening on the plant. Because this is not an automated process, a written protocol must be supplied by the producer to demonstrate how they will attain the dosage requirement, and documentation must be supplied by the

material manufacturer assuring this method will produce the desired uniform aramid fiber distribution.

Mix the aramid fiber with the aggregate longer, if needed, to allow thorough distribution of aramid fibers at the end of the mixing process and to promote asphalt coating of individual strands of aramid fiber. At the start of any fiber mixing, visually observe the reinforced HMA/WMA at the plant and in first three trucks at the point of discharge and prior to delivery to the job site. Observation shall include using a shovel or other device. Look for proper distribution of aramid fibers and make mixing adjustments if needed.

WMA: Use of a feeder system will be required for both Drum and Batch plants when producing Warm Mix Asphalt to ensure correct distribution and coating of the aramid fibers. This requirement maybe waved if the asphalt producer can demonstrate complete melting of the delivery material and proper incorporation of the aramid fibers into the WMA.

3.2 ACCEPTANCE

Acceptance of the reinforced HMA/WMA will include the following factors:

1. Aramid fiber is properly proportioned based on documentation comparing fiber feed to HMA/WMA mix production. A log of the total amount of aramid fibers applied certified by fiber manufacturer/supplier shall be required daily.
2. By visual inspection at the end of the mixing process, there is no clumping of aramid fiber or aramid delivery product and the aramid fibers are uniformly distributed.
3. All other mixture and density requirement of the asphalt as detailed in the Standard Specifications, current edition, shall apply.

PART 4 - MEASUREMENT AND PAYMENT

The Department will measure the quantity of Fiber Reinforcement for HMA/WMA as ton of asphalt placed with fibers. Each ton of asphalt placed with the aramid fibers according to this special note will be measured and paid for at the contract unit bid price per ton, and shall include full compensation for furnishing all labor, tools, equipment, and incidentals for doing all the work involved in adding the fibers to HMA/WMA.

Code	Pay Item	Pay Unit
24785EC	Fiber Reinforcement for HMA	Tons

June 23, 2025

SPECIAL NOTE FOR CLASS 4A GEOTEXTILE FABRICS USED IN STRUCTURAL PAVEMENT DESIGNS

1. DESCRIPTION. This special note covers requirements for Class 4A geotextile fabrics to be used for subgrade stabilization that is a part of a structural pavement design.

2. GEOTEXTILE FABRIC. Use woven fabric consisting only of long chain polymeric filaments or yarns such as polypropylene formed into a stable network such that the filaments or yarns retain their relative position to each other. Use fabric that is inert to commonly encountered chemicals and free of defects or flaws significantly affecting its physical or filtering properties.

   Ensure that the fabric is formed in widths of at least 6 feet. When necessary, sew sheets of fabric together to form required fabric widths. Sew the sheets of fabric together at the point of manufacture or other approved locations.

   The geotextile manufacturer is responsible for establishing and maintaining a quality control program to ensure compliance with this section. The manufacturer must participate in the National Transportation Product Evaluation Program (NTPEP) for Geotextiles and Geosynthetics and the product data must be posted in NTPEP DataMine.

   2.1 PACKING. During all periods of shipment and storage, wrap the fabric in a heavy duty protective covering to protect the fabric from direct sunlight, ultraviolet rays, temperatures greater than 140 °F, mud, dirt, dust, and debris.

   2.2 PHYSICAL REQUIREMENTS. Class 4A fabrics are to meet the current requirements of AASHTO M288.

   2.3 ACCEPTANCE. Obtain the Department’s approval for all material before incorporating it into the project.

3. CONSTRUCTION. The Engineer will reject the fabric if it has defects, rips, holes, flaws, deterioration, or damage. Prepare the surface to receive the fabric to a smooth condition, free of obstructions, debris, or sharp objects that may puncture the fabric. Place the fabric smooth and free of folds, wrinkles, or creases. Do not operate equipment directly on the fabric. Protect the fabric at all times from contamination. Remove and replace any contaminated fabric with uncontaminated fabric.

   Repair or replace any fabric damage. Repair individual isolated cuts, tears, or punctures by placing a patch of geotextile fabric that extends at least 3 feet beyond the damage in all directions or by field splicing the patch. Cover the fabric with a layer of the specified material within 14 calendar days. Remove and replace fabric not covered within 14 days.

4. ACCEPTANCE PROCEDURES FOR NON-SPECIFICATION FABRIC. Ensure that all geotextile fabric conforms to the requirements of this section. However, when non-specification geotextile fabric is inadvertently incorporated into the work before completion of testing, the Department may accept the material with a reduction in pay, provided the failure is marginal and will not cause poor performance. When the failure is excessive, then remove the geotextile fabric, and replace it unless the Engineer determines that the geotextile fabric can remain in place. The Department will apply the largest payment reduction when the material fails to meet more than one specification requirement. The Department will calculate the payment reduction on the invoice cost of the material delivered at the project site. The Department will reject geotextile fabric that fails and has not been incorporated into the work.

5. FASTENER PINS. The Engineer will accept fastener pins based on visual inspection on the project. Conform to the following:

   5.1 SUBGRADE STABILIZATION AND WRAPPED AGGREGATE DRAINAGE BLANKET. Provide fastener pins that are formed of 3/16 inch diameter or heavier steel, pointed at one end, with a head on the opposite end to retain a washer with a minimum diameter of 1 ½ inches.

6. MEASUREMENT. The Department will measure the quantity in square yards. The Department will not measure fabric when the Contract indicates the fabric is incidental to the work or when the specification for another item requires incidental installation of geotextile fabric.

   The Department will not measure material in laps or seams.

   When fabric is used in conjunction with an aggregate layer, the Department will measure the quantity of (1) the area of the lower surface of the aggregate layer, (2) the area of the upper surface of the aggregate layer, and (3) the area of the sides and ends of the aggregate layer; using the dimensions specified in the Plans for each fabric type that applies to its corresponding location(s).

   The Department will not measure for payment the repair or replacement of damaged fabric or replacement of fabric not covered within 14 days.

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

Code	Pay Item	Pay Unit
02608	FABRIC-GEOTEXTILE CLASS 4A	Square Yard

SPECIAL NOTE

STRUCTURE REMOVAL and RENOVATIONS

Notice of Intent (NOI) to Division of Air Quality

Laurel County
US-25 congestion relief and widening, and new connector from US-25 to KY-229.
Item No. 11-147

The roadway contractor is required to file a Notice of Intent (NOI) to the Division of Air Quality ten (10) business days (M-F) prior to the start of any demolition or rehabilitation work on the bridge superstructure (No bridge ID. Commercial Drive over Whitley Branch). Please use the KY Environmental and Energy Cabinet eForm Portal: (https://dep.gateway.ky.gov/eForms/Account/Home.aspx) to complete this task. It is also advised that copies of the submittal are sent to the Regional Office of the Kentucky Division of Air Quality KY DAQ Regional Offices to complete the notification process.

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.

Andy Beshear
GOVERNOR

TRANSPORTATION CAB INET
200 Mero Street
Frankfort, Kentucky 406 01

Jim Gray
SECRETARY

Asbestos Inspection Survey

To: Josh Higgins

District: 11

Date: December 19, 2022

Conducted By: O'Dail Lawson

Report Prepared By: O'Dail Lawson

Project and Structure Identification

Project Number: Laurel 11-0147

Structure ID: No Bridge ID

Structure Location: Commercial Drive over Whitley Branch

Sample Description: Any suspect materials collected were negative for asbestos.

Inspection Date: December 6, 2022

Results and Recommendations

The results of the samples collected were negative for the presence of asbestos above 1%. No abatement is required at this time.

It is recommended that this report accompany the 10-Day Notice of Intent for Demolition (Notification Form DEP 7036) which is to be submitted to the Kentucky Division of Air Quality prior to abatement, demolition, or renovation of any building or structure in the Commonwealth.

MRS, INC. *MRS, Inc. Analytical Laboratory Division*
332 West Broadway / Suite # 902 (502) 495-1212
Louisville, Kentucky - 40202 - 2133 Fax: (502) 491-7111

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N# # 3212172 Address: Laurel County - 11-0147
Client Name: K Y T C
Sampled By: O'Dail Lawson

				% FIBROUS ASBESTOS				% NON-ASBESTOS FIBERS			
Sample ID	Color	Layered	Fibrous	Chrysotile	Amosite	crocidolite	Others	Cellulose	Fiberglass	Syn. Fiber	Other/Mat.
# 11-1	Brown	Yes	No				None	2%			98%

Methodology : EPA Method 600/R-93-116
Date Analyzed : 17-Dec-22
Analyst : Winterford Mensah Reviewed By: Winterford Mensah
Signature

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

AIHA # 102459 AJHA #1 02459

Chain of Custody Record

Kentucky Transportation Cabinet

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

	O'Dail Lawson o'dail.lawson@ky.gov	**Client Information**	KY TRANSPORTATION CABINET
	KYTC	Results Code:	@ Commercial Drive over Whitley Branch.
Address:	200 Mero Street	ND = None Detected	
	Frankfort KY	FTD = Filter Tampering or Damaged	
Phone:	502-782-5020 Fax: 502-564-5655	N/A = Not Applicable	
PO#:		Samplers (signature):	
Project or Subject Reference	Laurel 11-0147		

Sample ID	Sample Description	Collected Date	Collected Time	Analysis Requested	Matrix	Color	Cont. Type	Preservative
11-1	Travel on Sealant	12/6/22	13:41	Asbestos bulk	sealant	Brown		N/A

Relinquished By:		Date/Time:
Received By:	Kristyn Mercer	Date/Time: 12/13/22
Relinquished By:		Date/Time:
Received at Lab By:		Date/Time:

LAUREL COUNTY, KY
FD06/FD59 063 0065 0055011

Contract ID: 261517
Page 28 of 328

ENVIRONMENTAL TRAINING CONCEPTS, INC
P.O Box 99603 Louisville, KY 40269
(502)640-2951

Certification Number: ETC-AIR-031522-00137

O'Dail Lawson

has on 03-15-2022, attended and successfully completed the requirements and passed the examination with a score of 70% of better on the entitled course.

ASBESTOS INSPECTOR REFRESHER

Training was in accordance with 40 CFR Part 763 (AHERA) approved by the Commonwealth of Kentucky, the Indiana Department of Environmental Management, Tennessee Department of Environment & Conservation and The Arkansas Department of Environmental Quality. The above student received requisite training for Asbestos Accreditation under Title II of the Toxic Substance Act (TSCA).

Conducted at: 1220 KY Mills Drive, Louisville, KY

Name – Training Manager

Expiration Date: 03-15-2023

Name - Instructor

LAUREL COUNTY
FD06/FD59 063 0025 009-011

SPECIAL NOTE

For Tree Removal

Laurel County
REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS.
Item No. 11-147

NO CLEARING OF TREES 5 INCHES OR GREATER (DIAMETER BREAST HEIGHT) FROM **MAY 15 THROUGH 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.

SPECIAL NOTE FOR PIPELINE INSPECTION

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

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

2.1 INSPECTION FOR DEFECTS AND DISTRESSES

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

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

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

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

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

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

3.0 MANDREL TESTING. Mandrel testing will be used for deflection testing. For use on Corrugated Metal Pipe, High Density Polyethylene Pipe, and Polyvinyl Chloride Pipe, use a mandrel device with an odd number of legs (9 minimum) having a length not less than the outside diameter of the mandrel. The diameter of the mandrel at any point shall not be less than the diameter specified in Section 3.6. Mandrels can be a fixed size or a variable size.

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

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

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

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

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

3.6 AASHTO Nominal Diameters and Maximum Deflection Limits.

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

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

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

% Deflection = [(AASHTO Nominal Diameter - D2) / AASHTO Nominal Diameter] x 100%

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

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

4.2 Record and submit all data.

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

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

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

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

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

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

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

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

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 an e-Ticketing Delivery Software for weighed asphalt material delivered to the project to report loads and provide daily running totals of weighed asphalt material for pay items and incidental work during the construction processes from the point of measurement and loading to the point of incorporation to the project.

2.0 MATERIALS AND EQUIPMENT. Contractor shall supply material data in JavaScript Object Notation (JSON) documents to the KYTC e-Ticketing Delivery Software (KYTC e-Ticketing Portal) via Application Programming Interface (API) or direct connection. Test and verify that ticket data can be shared from the original source no fewer than 30 days prior to material placement activities. An e-Ticketing Delivery Software supplier 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 material data delivery capabilities. Virtual meetings may be hosted in lieu of on-site meetings when deemed appropriate by the Engineer.

Provide e-Ticketing Delivery Software that will meet the following:

1. The e-Ticketing Delivery Software shall be fully integrated with the Contractor's Load Read-Out scale system at the material source location.

2. The e-Ticketing Delivery Software shall provide real-time delivery to KYTC e-Ticketing Portal.

3. Transmit any updates to the ticket data within 5 minutes of a change.

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 software in accordance with the manufacturer's specifications.

2. Verify that all pertinent information is provided by the software 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 the project.

1. Asphalt Material

a. **Real-time Continuous Data Items**

Provide the Engineer access to JSON documents capable of being transmitted through the KYTC's e-Ticketing Portal that displays the following information in real-time with a web-based system compatible with iOS and Windows environments.

- Each Truck
  - Supplier Name
  - Supplier Address
  - Supplier Phone
  - Plant location
  - Date
  - Time at source
  - Project Location

- Contract ID#
- Carrier Name
- Unique Truck ID
- Description of Material
- Mix Design Number
- Gross, Tare and Net Weight
- Weighmaster

4.0 MEASUREMENT. The Department will not measure the electronic delivery management system.

5.0 PAYMENT. The Department will not measure this work for payment and will consider all items contained in this note to be incidental to the asphalt mixtures on the project, as applicable.

May 5, 2025

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

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 an e-Ticketing Delivery Software for weighed aggregate material delivered to the project to report loads and provide daily running totals of weighed aggregate material for pay items and incidental work during the construction processes from the point of measurement and loading to the point of incorporation to the project.

2.0 MATERIALS AND EQUIPMENT. Contractor shall supply material data in JavaScript Object Notation (JSON) documents to the KYTC e-Ticketing Delivery Software (KYTC e-Ticketing Portal) via Application Programming Interface (API) or direct connection. Test and verify that ticket data can be shared from the original source no fewer than 30 days prior to material placement activities. An e-Ticketing Delivery Software supplier 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 material data delivery capabilities. Virtual meetings may be hosted in lieu of on-site meetings when deemed appropriate by the Engineer.

Provide e-Ticketing Delivery Software that will meet the following:

1. The e-Ticketing Delivery Software shall be fully integrated with the Contractor's Load Read-Out scale system at the material source location.

2. The e-Ticketing Delivery Software shall provide real-time delivery to KYTC e-Ticketing Portal.

3. Transmit any updates to the ticket data within 5 minutes of a change.

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 software in accordance with the manufacturer's specifications.

2. Verify that all pertinent information is provided by the software 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 the project.

1. Aggregate Material

a. **Real-time Continuous Data Items**

Provide the Engineer access to JSON documents capable of being transmitted through the KYTC's e-Ticketing Portal that displays the following information in real-time with a web-based system compatible with iOS and Windows environments.

- Each Truck
  - Supplier Name
  - Supplier Address
  - Supplier Phone
  - Plant location
  - Date
  - Time at source
  - Project Location

- Contract ID#
- Carrier Name
- Unique Truck ID
- Description of Material
- Load Number
- Gross, Tare and Net Weight
- Weighmaster

4.0 MEASUREMENT. The Department will measure the 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. Payment will be full compensation for costs related to providing the e-Ticketing Delivery Software, including integration with plant load-out systems, and report viewing/exporting process. All quality control procedures including the software representative's technical support and on-site training shall be included in the Contract lump sum price.

Code	Pay Item	Pay Unit
26248EC	ELECTRONIC DELIVERY MGMT SYSTEM-AGG	LS

May 5, 2025

SPECIAL NOTE FOR EXPERIMENTAL KYCT AND FIELD RUT TESTING
June 2025 Update

1.0 General

1.1 Description. The KYCT (Kentucky Method for Cracking Test) and the IDEAL-RT/IDT-HT 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 and stability of the bituminous mixes. Additionally, the data will help the Department to create future performance-based specifications which will include the KYCT and field rutting test methods.

2.0 Equipment

2.1 KYCT Testing Equipment. The Department will require a Marshall Test Press with digital recording 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° +/- 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 Field Rutting Tests. I f t he contractor elects to perform the IDEAL-RT test, in conformance with ASTM D8360-22, the acquisition of the “Option A” or “Option B” test fixture is required. If the IDT-HT is desired, the test press utilized for the KYTC is sufficient. The Department shall approve all test configurations at their discretion.

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.

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 plant production of all surface mixtures. Conform to KYTC Specifications for Mix Design approvals. All production testing is currently informational.

3.2.1 KYCT Frequency. Obtain an adequate sample of hot mix asphalt to ensure 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 after the specified amount of oven conditioning, fabricate the KYCT samples with the gyratory compactor in accordance with Section 2.4 of this Special Note. Analysis of the KYCT specimens 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, for field specimens, fabricate three replicates for cracking resistance analyses and three replicates for rutting resistance analyses. The specimens shall be compacted at the temperature in accordance with KM 64-411.

Contrary to the Kentucky Method, plant produced bituminous material shall be short-term conditioned immediately after sampling for two hours uncovered in the oven at compaction temperature in accordance with KM 64-411.

While the fabricated specimens are allowed to cool in air (fan is permissible) for 30 minutes +/- 5 minutes, find the bulk specific gravity of each specimen according to AASHTO T166. Next, condition the replicates in a 77 °F water bath for 30 minutes +/- 5 minutes. To ensure confidence and reliability of the test results provided by KYCT testing and Field Rut testing, reheating of the asphalt mixture is prohibited.

3.2.3 Long Term Aging CT's. For long-term aging and cracking resistance considerations in mix design, mix and condition 3 specimens uncovered for 20 hours at compaction temperature in accordance with KM 64-411. Perform KYCT testing in accordance with KM 64-450 and record the results on the Long-Term KYCT tab of the latest version of the MixPack.

3.2.4 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 with 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.

3.2.5 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 Field Rut Testing. Perform the rut resistance analysis (IDEAL-RT or IDT-HT) in accordance with ASTM D8360-22 or ALDOT458, respectively. Contrary to ASTM D8360 & ALDOT458, precondition the test specimens in a water bath or forced draft oven at 50 °C +/- 1 °C for 60 +/- 5 min before completing the test.

3.3.1 Field Rut Testing Frequency. Perform one test per lot of mixture produced. The plant produced bituminous material sampled for the field rut test does not have to be obtained at the same time as the acceptance and KYCT sample. If the field rut 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 test specimens.

3.3.2 Number of Specimens and Conditioning. Fabricate in accordance with the Kentucky Method for KYCT Index Testing. Contrary to the method, for field specimens, fabricate three

replicates for rutting resistance analyses. The specimens shall be compacted at the temperature in accordance with KM 64-411. Contrary to the Kentucky Method, plant produced bituminous material shall be short-term conditioned immediately after sampling for two hours uncovered in the oven at compaction temperature in accordance with KM 64-411.

3.3.3 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. All times shall be recorded on the AMAW.

3.3.4 File Name. Record all field rut data in the latest version of the AMAW.

4.0 Data

Submit the AMAW and all test data that was obtained for acceptance, gradation, KYCT, and field rut 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 Payment

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

June 12th, 2025

SPECIAL NOTE FOR DOLOMITIC POLISH-RESISTANT AGGREGATE IN CLASS A 0.38-IN. AND 0.50-IN. NOMINAL ASPHALT MIXTURES

Contrary to Subsection 403.03.03, when utilizing a dolomitic polish-resistant aggregate as the coarse portion of the Class A 0.38-in. or 0.50-in.-nominal asphalt surface mixture, provide an asphalt mixture conforming to the following requirements:

- 70 percent of total combined aggregate is Class A polish-resistant aggregate.
- Any coarse aggregate utilized in the mixture shall be classified as Class A polish-resistant.
- Non-dolomitic substitutes from other Class A sources may be used as direct substitutes
- All mixes must have DFT testing/results submitted to Division of Materials with any supporting documentation prior to completion of the project.

Dynamic Friction Testing Procedure. Prepare samples for DFT analysis in accordance with PP 104. Friction testing shall be conducted by an AASHTO-accredited facility and data shall be provided in accordance with ASTM E1911 conforming to the following three-wheel polishing schedule. Variations to the testing frequency or methodology shall be coordinated with Division of Materials prior to testing.

Polishing Cycles
5,000
25,000
75,000
150,000

SPECIAL NOTE FOR RECYCLED ASPHALT PAVEMENT (RAP) STOCKPILE MANAGEMENT

I. GENERAL

The use of reclaimed asphalt pavement (RAP) from Department projects or other approved sources in hot mix asphalt (HMA) or warm mix asphalt (WMA) shall be subject to stockpile management and handling of material as described in this section.

The Department approves RAP on a stockpile basis, following the process set forth in this method. The contractor's responsibilities in the process are as follows:

- To obtain the Department's approval of all RAP prior to its use on a Department project and to deliver test data and samples as required
- To monitor and preserve the quality and uniformity of the approved material during storage and handling, adding no unapproved material to the existing stockpile
- To comply with the Department's requirements regarding replenishment of approved stockpiles

The Department will approve RAP based on its composition and variability in gradation and asphalt content, and on visual inspections of the stockpile, which the Department may conduct at its discretion. The Department may withdraw approval of a stockpile if the requirements of this specification are not followed in good faith.

The Maximum Percentage Allowed in a mix design will be based on these criteria and on the category of RAP source, as defined in this document.

II. APPROVAL PROCESS

Qualified asphalt producers (listed in List of Approved Materials-Asphalt Mixing Plants) may submit requests for RAP stockpile approval to the Asphalt Branch, Division of Materials, in the Annual Certification for Previously Approved Asphalt Mixing Plants and Related Equipment. The requester shall provide test results as prescribed in Part IID. The Division of Materials may, at their discretion, collect samples or inspect a RAP stockpile consistent with Section IIE.

Upon completion of the review of testing results and, if applicable, visual inspection, the Division of Materials, Asphalt Branch will approve or disapprove the material by letter and will assign a Stockpile Identification Number for each approved RAP stockpile. Note: The contractor's average gradation and asphalt content, as listed in the approval letter, shall be the gradation used in subsequent mix designs. The approval letter will state the applicable limits on the use of the material in mix designs and will summarize the Department's findings, listing the average gradation and asphalt content from the contractor's tests and the corresponding values found by the Department. Where the Maximum Percentage Allowed is low due to variability, the contractor may elect to improve the uniformity of the material by further processing and may again sample, test, and request approval for the material.

No material shall be added to a stockpile after it has been approved, except as provided in Parts V, VI, and VII below.

IIA. RAP Quality Management Plan

For a contractor to receive approval to use RAP on any department project, a RAP Quality Management Plan must first be approved by the department. The RAP Quality Management Plan shall be submitted to the

Division of Materials annually for approval as part of the Contractor's Quality Control Plan/Checklist. The Quality Management Plan is required to demonstrate how the Contractor will provide consistency and quality of material utilized in all asphalt mixes produced for use on Department projects. The Quality Management Plan shall include:

- Unprocessed RAP Stockpiles
  - Designation of stockpile(s) as single or multiple source
  - Designation of stockpile(s) as classified or unclassified
  - Designation of stockpile(s) as captive or continuously replenishing
  - Plan for how stockpile(s) is built (layers, slope, etc.)
  - Plan to minimize stockpile(s) contamination
- Processing and Crushing
  - Equipment used to feed screener or crusher
  - Excavation process based on equipment type
- Processing Millings
  - Single Project or Source
    - Screening, Fractionation, or Crushing plan
  - Multiple Source
    - Process to achieve uniform material from stockpile
    - Screening, Fractionation, or Crushing plan
- Processed RAP Stockpiles
  - Minimization of segregation
  - Minimization of moisture

IIB. RAP Stockpile Placement

All processed RAP stockpiles shall be placed on a sloped, paved surface. The requirement for a paved surface may be waived by the Cabinet if the Contractor's RAP Quality Management Plan demonstrates effective material handling that will minimize deleterious material from beneath the processed stockpile entering the plant. *No processed stockpile will be placed directly on grass or dirt.*

IIC. Stockpile Identification Signs

RAP stockpiles shall be identified with posted signs displaying the gradation of material in the stockpile (course, intermediate, or fine). These signs shall be made of weatherproof material and shall be highly visible. Numerals shall be easily readable from outside the stockpile area. If a stockpile exists in two or more parts, each part must have its own sign.

IID. Standard Approval Procedure

The Contractor shall obtain random samples representative of the entire stockpile and shall have each sample tested for gradation and asphalt content according to KM 64-426, KM 64-427, and AASHTO T308. The material samples must be in its final condition after all crushing and screening. At least one sample shall be obtained for each 1,000 tons of processed RAP, with a minimum of five samples per stockpile. Sampling shall be performed according to the method prescribed for asphalt mix aggregates in the Department's Materials Field Testing and Sampling Manual and KM 64-601. The minimum sampling size (after quartering) for tests of RAP samples is 1,500 g. except for samples containing particles more than one inch in diameter, for which the minimum is 2,000 g.

To request approval of a RAP stockpile, submit the following documents to the Division of Materials. It is the requester's responsibility to correctly address, label, and deliver these submittals:

• Submit request for approval at beginning of the paving season as part of the Annual Certification for Previously Approved Asphalt Mixing Plants and Related Equipment.

• If requesting approval after paving season begins, submit memo, including stockpile portion of the inspection list for Annual Certification for Previously Approved Asphalt Mixing Plants and Related Equipment, to Division of Materials.

• Reports of the tests prescribed above using the Stockpile <INSERT NAME> document.

• A drawing of the plant site showing the location of the stockpile to be approved *and all other stockpiles on the premises*

Mail, deliver or email the request form, with test reports and site drawing, to:

Kentucky Transportation Cabinet
Division of Materials
ATTN: Asphalt Branch Manager
1227 Wilkinson Boulevard
Frankfort, Kentucky 40601

Robert.Semones@ky.gov

IIE. Tests and inspections by the Department

The Department shall have the right to observe the collection of samples, or to perform the sampling and testing as a verification of contractor submittal. As a condition of approval, the Department may at any time inspect and sample RAP stockpiles for which approval has been requested and may perform additional quality control tests to determine the consistency and quality of the material.

The approval letter issued by the Department will include any results of verification testing performed by the Cabinet. The approved contractor results should be used by mix design technicians in the design calculations.

III. RAP STOCKPILE TIERED MANAGEMENT AND EFFECTIVE BINDER CONTENT

The stockpile management and approval requirements will be tiered based on the maximum cold feed percentages as defined in this section and Table 1. below.

Table 1. Tiered Testing Requirements

Mix Type	0-≤12%	12-≤20%	20-≤35%
Surface	Tier 1	Tier 2	Tier 3
Base	Tier 1	Tier 2	Tier 3

NOTE: All asphalt mixes and binder selection will be subject to Section 409 of the current Standard Specifications.

The following requirements will apply based on the percentage of RAP in the mix.

Tier 1

Tier 1 mixes (less than or equal to 12% RAP) will be subject to the requirements of sections IIA, IIB, and IIC.

Tier 2

Tier 2 mixes (12% to less than 20% RAP) will be subject to the requirements of Section II in its entirety and Table 2 requirements.

Tier 3

Tier 3 Asphalt Base mixes with 20% to less than 35% RAP, Tier 3 Asphalt Surface mixes with 20% to less than 30% RAP will be subject to Section II in its entirety and Table 2 requirements.

IV. MAXIMUM PERCENTAGE OF RAP ALLOWED

The Maximum Percent of RAP allowed in mix designs shall be the lowest percentage determined by the gradation and asphalt content of the RAP, as established under the criteria below, and requirements listed in Section III.

Limits according to range in gradation and bitumen content

The Maximum Percent of RAP Allowed, based on gradation and asphalt content, shall be determined by the Department using the standard deviation of these values. This standard deviation will be calculated using data provided by the contractor from at least five samples. While the contractor is required to provide the data from these tested samples, the Department retains the discretion to perform its own sampling and testing to support or verify its findings. An apparent outlier shall not be considered in determining these ranges. Where one result appears to be unrepresentative of the whole, two or more additional samples shall be tested. The outlying value of all tests shall then be excluded from the range. The maximum percentage of RAP allowable shall be the lowest percentage determined according to Table 2 below.

Table 2. Maximum Percent RAP According to Variability in Test Results

	Standard Deviation as calculated above:		
Surface			
% asphalt content	< 0.4	< 0.5	
% passing No. 200 sieve	< 1.25	< 1.5	
% passing Median Sieve	< 4.0	< 5.0	
	Allowable RAP Cold Feed %		
	Tier 3 - 20%-30%	Tier 2 - 12%-20%	Tier 1 - 0%-12%
Base			
% asphalt content	< 0.5	< 0.75	
% passing No. 200 sieve	< 1.5	< 2.25	
% passing Median sieve	< 5.0	< 7.0	
	Allowable RAP Cold Feed %		
	Tier 3 - 20%-35%	Tier 2 - 12%-20%	Tier 1 - 0%-12%

NOTE: These allowances notwithstanding, the Contractor is required to maintain the mixture within the Mixture Control Tolerances of Kentucky Method 443.
The percentage allowable in mix designs shall be limited to meet the design criteria for viscosity established in the Standard Specifications.

V. GENERAL STOCKPILE REQUIREMENTS AND REPLENISHMENT

V.A. Single Pavement Source

Early approval of material from a single pavement source. When a new stockpile is to consist entirely of millings removed from a single existing pavement, the stockpile may be approved based on samples taken during the milling and processing operations, prior to completion of milling. The initial stockpile may be approved as either a new stockpile or a new stockpile in continual replenishment status.

For continual replenishment status, samples shall be taken from the processed stockpile after it reaches 1,000 tons. A total of five initial samples, plus one additional sample for every 1,000 tons, is required. As prescribed in Part II above, the contractor shall test all samples and deliver the test results, together with a letter request for approval in Continual Replenishment status, to the address indicated. The stockpile shall be subject to initial approval as prescribed above in Part II. Once approved, it may be replenished without further approvals as provided in Part VII below.

V.B. Heterogeneous or contaminated material

Asphalt pavement millings containing traffic detection loops, raised pavement markers, or other debris must be separated and excluded before stockpiling RAP for approval for use in KYTC asphaltic concrete mixtures.

No material other than RAP from an approved stockpile shall be included in mixtures for State projects. The following materials are specifically excluded:

• Material contaminated with foreign matter such as liquids, soil, concrete, or debris

• Plant waste, especially waste containing abnormal concentrations of bitumen, drum build-up, or material from spills or plant clean-up operations

The following materials shall not be added to or placed in proximity to an approved stockpile but may be accumulated in a separate stockpile and submitted for approval according to Part III:

- Production mixtures returned to the plant for any reason.
- Mis-proportioned mixtures, especially those generated at start-up.

VI. REPLENISHMENT OF STOCKPILES

An approved RAP stockpile may be replenished with Department approval, provided the replenishment material meets all necessary requirements for approval and maintains uniformity in gradation and asphalt content as outlined in this document.

VI.A. Procedure and approval criteria

The procedure for requesting approval of a stockpile replenishment, that is not in continual replenishment status, shall be the same as for approval of an original stockpile, and the material for the replenishment shall meet all criteria for approval as a new stockpile. RAP proposed for replenishment shall be sampled and tested by the Contractor for gradation and asphalt cement as prescribed in Section II above. The Laboratory shall

review these results and provide approval for use in Department asphalt mix designs, according to Table 2 above.

VI.B. Effect of replenishment on existing approved mix designs

Replenishment of a stockpile may render certain mix designs invalid, depending on the percent RAP allowed in the design and on the difference in average properties between the old and new stockpiles. A replenished stockpile may be used as the RAP ingredient in an existing approved design provided that:

1. The Maximum Percent Allowed for the replenishment stockpile equals or exceeds the percent RAP called for in the mix design. In no case may the Maximum Percent Allowed be exceeded.

However, if a mix design calls for up to 5.0 percent more than the Maximum Percent Allowed for the replenishment, the *design* may be adjusted, with approval, to use the lower percent allowed, provided that the production mixture continues to meet all acceptance criteria. For example, a design which calls for 20 percent RAP may be adjusted and produced with 15 percent if it continues to meet for acceptance.

VII. CONTINUAL REPLENISHMENT WITHOUT RE-APPROVAL

At the request of the contractor, a previously approved stockpile may be placed in Continual Replenishment Status and may be replenished any number of times without re-approval provided that:

1. Replenishment is within six months of the last stockpile addition.
2. The contractor shall continue to monitor and test the materials added to the stockpile and shall forward these results to the Division of Materials for every 1,000 tons of RAP added to the stockpile.
3. The contractor must certify that replenishment materials are free of contaminants.
4. The Department shall be notified by letter to the Director of the Division of Materials that the stockpile is being replenished on a continual basis.
5. The RAP Maximum Percent Allowed for continual replenishment shall be limited by Sections III and IV.

Note: Upon request, one 20-pound sample bag of RAP for each Continual Replenishment Stockpile shall be submitted to the Division of Materials for petrographic analysis every 12 months.

The Department may inspect, sample, and test such stockpiles at its discretion and may, upon determining that the stockpile is unsuitable, withdraw approval of the material and all mix designs which include it. Approval of the stockpile may be withdrawn at any time based upon extreme or erratic ingredient proportions, unsuitable ingredients, or poor performance, as determined by the Division of Materials, Asphalt Branch. The Department will conduct periodic comparison testing on the opposite quarters of samples submitted by the Contractor for special replenishment approval category. The approval of the stockpile may be withdrawn if

erroneous information was found on the contractor's testing and/or improper sampling procedures were involved after a thorough investigation.

VIII. DEPLETION OF STOCKPILE AND EXPIRATION OF APPROVAL

When a stockpile has been fully depleted, the Contractor may replenish it within 24 months after the date of depletion; a depleted stockpile not replenished after 24 months will be removed from the approved list and may not be replenished.

Approval of a stockpile may be withdrawn if, in the finding of the Division of Materials, Asphalt Branch, the total amount of material used in new mixtures equals the total tonnage of the original stockpile plus all approved replenishments. Six years from the original approval of a stockpile or from its most recent replenishment, a stockpile shall be presumed to be depleted, and its approval shall expire. This shall apply to all stockpiles, regardless of status or history of use.

IX. RECORDS

The Contractor shall maintain records at the plant site on all RAP stockpiles. These records shall be available for inspection by representatives of the Department and shall include the following:

- All test results.
- The Department's approval letter for each stockpile and replenishment, together with the Contractor's requests for approval and all data submitted therewith.
- A current drawing of all stockpile locations at the plant site, including unapproved stockpiles, showing stockpile numbers of all stockpiles approved for State work.

X. RELOCATION OF STOCKPILE

If material from an approved RAP stockpile is to be moved to another location, the contractor shall seek approval from the Department prior to its further use on State projects. A letter request shall be submitted to the Division of Materials indicating the current stockpile location, the total quantity of material to be moved, and the amount, if any, to remain in the current location. The Division of Materials will issue an approval letter applicable to the new location.

June 18, 2025

LAUREL CO. KY 192 ~m.p. 20.27
~LAT/LONG N 37.10976, W 84.06899
STATION A87

SENSOR LOCATIONS ARE SCHEMATIC ONLY AND SHALL BE DETERMINED IN THE FIELD AND APPROVED BY DIVISION OF PLANNING PERSONNEL PRIOR TO ANY CONSTRUCTION.

ALL LOOPS SHALL BE 6'X6' SQUARE AND SHALL BE INSTALLED 16' FROM LEADING EDGE TO LEADING EDGE AS SHOWN. PIEZOELECTRIC SENSORS (PIEZOS) SHALL BE INSTALLED 5' FROM THE EDGE OF LOOPS WITH THE EDGE OF EACH PIEZO FLUSH WITH THE EDGE OF THE CORRESPONDING DRIVING LANE. LOOPS AND PIEZOS SHALL BE INSTALLED SPLICE-FREE TO THE CABINET AND A MINIMUM OF 2' OF WIRE FOR EACH SENSOR SHALL BE COILED AND LABELED INSIDE EACH JUNCTION BOX AND CABINET. DIVISION OF PLANNING PERSONNEL WILL CONNECT THE LOOPS AND PIEZOS INSIDE THE CABINET.

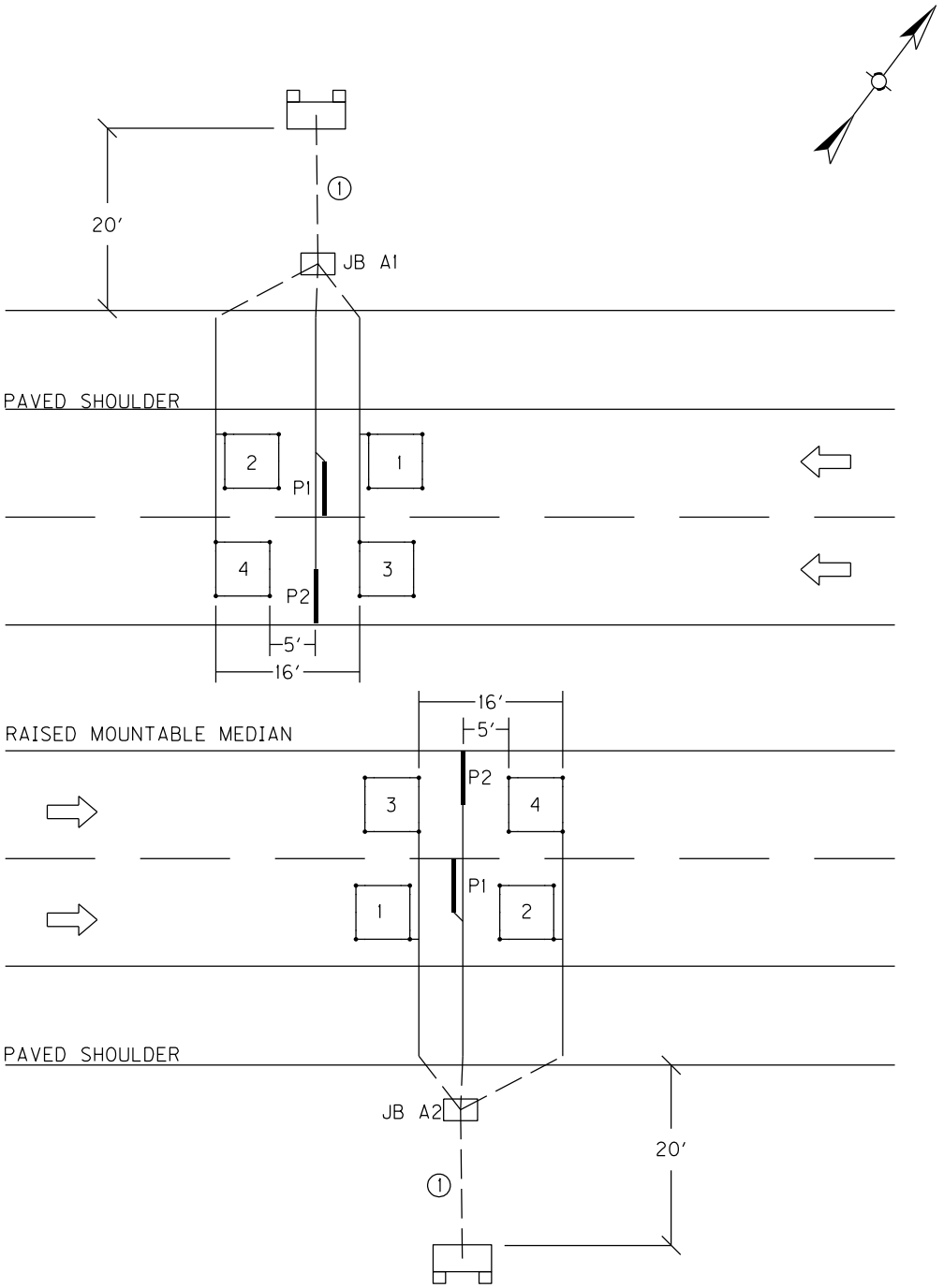
INSTALL TWO (2) TYPE A JUNCTION BOXES (JB A1 AND JB A2).

INSTALL ONE (1) 1¼" CONDUIT FROM EACH SAW SLOT TO NEAREST JUNCTION BOX.

INSTALL TWO (2) 20"x20"x8" CABINET MOUNTED TO TWO (2) WOOD POSTS EACH.

CODED NOTE:

(1) INSTALL ONE (1) 2" CONDUIT.



SCALE 1"=20'

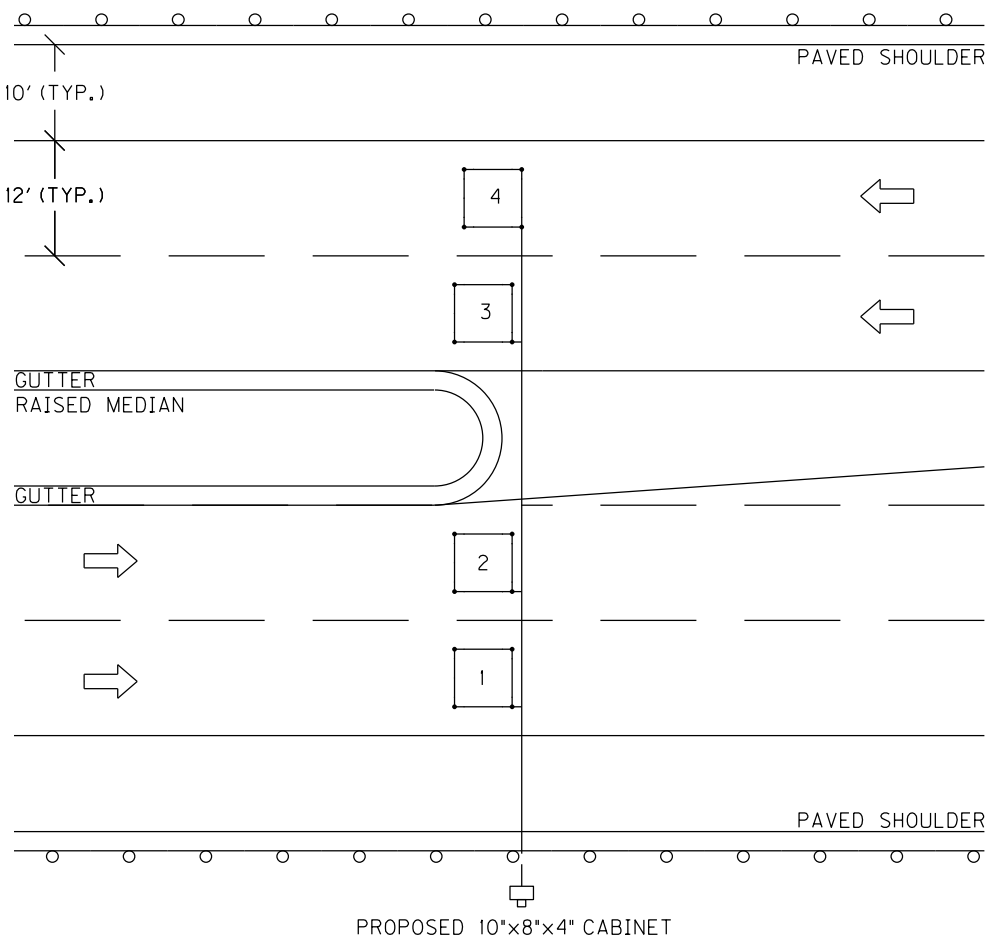
LAUREL CO. KY 192 ~m.p. 21.11
~LAT/LONG N 37.11657, W 84.05775
STATION A85

SITE LOCATION IS APPROXIMATE AND WILL BE DETERMINED IN THE FIELD AND APPROVED BY DIVISION OF PLANNING PERSONNEL PRIOR TO ANY CONSTRUCTION.

ALL LOOPS SHALL BE 6'X6' SQUARE. LOOPS SHALL BE INSTALLED SPLICE-FREE TO THE CABINET. A MINIMUM OF 2' OF WIRE FOR EACH SENSOR SHALL BE COILED AND LABELED INSIDE THE 10"x8"x4" CABINET. DIVISION OF PLANNING PERSONNEL WILL CONNECT THE LOOPS INSIDE THE 10"x8"x4" CABINET.

INSTALL ONE (1) 10"x8"x4" CABINET MOUNTED TO ONE (1) WOOD POST.

INSTALL ONE (1) 1¼" CONDUIT FROM END OF SAW SLOT TO THE 10"x8"x4" CABINET.



SCALE 1"=20'

PERMANENT TRAFFIC DATA ACQUISITION STATIONS
ESTIMATE OF QUANTITIES

Bid Item Code	Description	Unit	Quantity
4793	CONDUIT 1 ¼ INCH	LIN FT	90
4795	CONDUIT 2 INCH	LIN FT	40
4811	ELECTRICAL JUNCTION BOX TYPE B	EACH	
4820	TRENCHING AND BACKFILLING	LIN FT	118
4821	OPEN CUT ROADWAY	LIN FT	
4829	PIEZOELECTRIC SENSOR	EACH	4
4830	LOOP WIRE	LIN FT	2650
4833	WIRE – NO. 8	LIN FT	
4834	WIRE – NO. 6	LIN FT	
4850	CABLE NO. 14/1 PAIR	LIN FT	
4871	POLE – 35’ WOODEN	EACH	
4895	LOOP SAW SLOT AND FILL	LIN FT	565
4899	ELECTRICAL SERVICE	EACH	
4960	REMOVE AND REPLACE SIDEWALK	SQYD	
20213EC	INSTALL PAD MOUNT ENCLOSURE	EACH	
20359NN	GALVANIZED STEEL CABINET	EACH	2
20360ES818	WOOD POST	EACH	5
20391NS835	ELECTRICAL JUNCTION BOX TYPE A	EACH	2
20392NS835	ELECTRICAL JUNCTION BOX TYPE C	EACH	
20468EC	ELECTRICAL JUNCTION BOX 10x8x4	EACH	1
21543EN	BORE AND JACK CONDUIT – 2 INCH	LIN FT	
23206EC	INSTALL CONTROLLER CABINET	EACH	
24963ED	LOOP TEST	EACH	

MATERIAL, INSTALLATION, AND BID ITEM NOTES FOR PERMANENT TRAFFIC DATA ACQUISITION STATIONS

1. DESCRIPTION

Except as specified in these notes, all work shall consist of furnishing and installing all materials necessary for permanent data acquisition station equipment installation(s) and shall be performed in accordance with the current editions of:

- The Contract
- Division of Planning Standard Detail Sheets
- Kentucky Transportation Cabinet, Department of Highways, *Standard Specifications for Road and Bridge Construction*
- Kentucky Transportation Cabinet, Department of Highways, Standard Drawings
- National Fire Protection Association *(NFPA) 70: National Electrical Code*
- Institute of Electrical and Electronic Engineers (IEEE), *National Electrical Safety Code*
- Federal Highway Administration, *Manual on Uniform Traffic Control Devices*
- American Association of State Highway and Transportation Officials (AASHTO), *Roadside Design Guide*.
- Standards of the utility company serving the installation, if applicable

The permanent traffic data acquisition station layout(s) indicate the extent and general arrangement of the proposed installation and are for general guidance. Any omission or commission shown or implied shall not be cause for deviation from the intent of the plans and specifications. Information shown on the plans and in this proposal and the types and quantities of work listed are not to be taken as an accurate or complete evaluation of the material and conditions to be encountered during construction. The bidder must draw his own conclusion as to the conditions encountered. The Department of Highways (Department) does not give any guarantee as to the accuracy of the data and no claim will be considered for additional compensation if the conditions encountered are not in accordance with the information shown. If any modifications of the plans or specifications are considered necessary by the Contractor, details of such modifications and the reasons, therefore, shall be submitted in writing to the Engineer for written approval prior to beginning such modified work.

The Contractor shall contact all utility companies and the district utility agent prior to beginning construction to insure proper clearance and shielding from existing and proposed utilities. The Contractor shall use all possible care in excavating on this project so as not to disturb any existing utilities whether shown on the plans or not shown on the plans. Any utilities disturbed or damaged by the Contractor during construction shall be replaced or repaired to original condition by the Contractor at no cost to the department. If necessary, to avoid existing utilities, the Contractor shall hand dig areas where poles or conduit cross utilities.

The Contractor shall be responsible for all damage to public and/or private property resulting from his work.

The Contractor shall inspect the project site prior to submitting a bid and shall be thoroughly familiarized with existing conditions. Submission of a bid will be considered an affirmation of this inspection having been completed. The Department will not honor any claims resulting from site conditions.

2. MATERIALS

All proposed materials shall be approved prior to being utilized. The Contractor shall submit for material approval an electronic file of descriptive literature, drawings and any requested design data for the proposed materials. After approval, no substitutions of any approved materials may be made without the written approval of the Engineer.

Materials requiring sampling shall be made available a sufficient time in advance of their use to allow for necessary testing.

2.1. Anchoring

2.1.1. Anchor and Anchor Rod

Anchor, except rock anchor, shall be expanding type, with a minimum area of 135 square inches.

Anchor rod shall be galvanized steel, double-eye, have a minimum diameter of 5/8 inches, and a minimum length of 84 inches. Minimum holding capacity shall be 15,400 lbs.

Rock anchor shall be galvanized steel, triple-eye, expanding type, with a minimum diameter of ¾ inch, a minimum 53 inches long, and a minimum tensile strength of 23,000 lb.

2.1.2. Guy Wire and Guy Guard

Guy wire shall be Class A, Zinc-coated, 3/8 inch diameter, high strength grade steel (minimum 10,800 lb.) and galvanized per ASTM A475. Guy guard shall be 8’ long, fully-rounded, yellow, and able to be securely attached to the guy wire.

2.1.3. Strandvise for Guy Wire

Strandvise for guy wire shall be 3/8 inch and rated to hold a minimum of 90% of the rated breaking strength (RBS) of the strand used.

2.2. Asphalt

Asphalt shall be a minimum CL2 Asph Surf 0.38B PG64-22 and conform to the *Standard Specifications for Road and Bridge Construction.*

2.3. Backer Rod

Backer rod shall be ½ inch diameter, closed cell polyethylene foam and shall meet or exceed the following physical properties:

- Density (average): 2.0 lbs/cu.ft. (minimum): ASTM D 1622 test method
- Tensile Strength: 50 PSI (minimum): ASTM D 1623 test method
- Compression Recovery: 90% (minimum): ASTM D 5249 test method
- Water Absorption: 0.03 gm/cc (maximum): ASTM C 1016 test method

2.4. Cabinets

2.4.1. Galvanized Steel Cabinet

Galvanized Steel Cabinet shall be constructed of 16 or 14 gauge galvanized steel and shall meet or exceed the industry standards set forth by UL 50 and NEMA 3R. The finish shall be an ANSI 61 gray polyester powder finish inside and out over the galvanized steel. Cabinet shall have minimum inside dimensions of 20 inches high by 20 inches wide by 8 inches deep.

The cabinet shall be equipped with the following:

- Drip shield top
- Seam-free sides, front, and back, to provide protection in outdoor installations against rain, sleet, and snow
- Hinged cover with 16 gauge galvanized steel continuous stainless steel pin.
- Cover fastened with captive plated steel screws, knob or latch
- Hasp and staple for padlocking
- No gaskets or knockouts
- Back panel for terminal block installation
- Post mounting hardware
- Terminal Blocks

2.4.2. Anchor Bolt for Pad Mounted Cabinet

Anchor bolt for pad mounted cabinet shall be galvanized steel with minimum dimensions of 3/8 inch by 6 inches.

2.5. Concrete

Concrete shall be Class A and conform to the *Standard Specifications for Road and Bridge Construction.*

2.6. Conduit and Conduit Fittings

Conduit and conduit fittings shall be rigid steel unless otherwise specified.

Conduit shall be zinc galvanized inside and out and conform to the NEC, UL Standard 6, and ANSI C-80.1.

Rigid Steel Conduit Fittings shall be galvanized inside and out and conform to the NEC, UL Standard 514B, and ANSI C-80.4. Intermediate Metal Conduit (IMC) will not be approved as an acceptable alternative to rigid steel conduit.

2.7. Conduit sealant

Conduit sealant shall be weather-, mold-, and mildew-resistant and chemically resistant to gasoline, oil, dilute acids and bases. Conduit sealant shall be closed cell type and shall meet or exceed the following properties:

- Cure Time — 20 minutes max.
- Density — 64.4 kg/m3; 6 lbs/ft3
- Compressive Strength (ASTM 1691) — 13.8 MPa; 330 or 300 psi

- Tensile Strength (ASTM 1623) 15.9 MPa; 270 or 250 psi
- Flexural Strength (ASTM D790) 14.5 MPa; 460 or 450 psi
- Service Temperature -20 to 200 F

2.8. Electrical Service Meter Base

Electrical service meter base shall meet or exceed all requirements of the National Electrical Code and the local utility providing the electrical service.

2.9. Electrical Service Disconnect

Electrical service disconnect shall meet or exceed all requirements of the National Electrical Code and the local utility providing the electrical service.

2.10. Flashing Arrow

Flashing Arrow shall conform to the *Standard Specifications for Road and Bridge Construction.*

2.11. Ground Fault Circuit Interrupter (GFCI) Receptacle

Ground Fault Circuit Interrupter Receptacle shall be 2-pole, 3-wire, 20 Amp, 125 Volt, 60 Hz, NEMA 5-20R configuration and meet or exceed the following standards and certifications:

- NEMA WD-1 and WD-6
- UL 498 and 943
- NOM 057
- ANSI C-73

This item shall include a UL listed, 4 inch x4 inch x $2^{1}/_{8}$ inch box with ¾ inch side and end knockouts and a 1½ inches deep, single-receptacle cover to house the GFCI receptacle. Box and cover shall be hot rolled, galvanized steel with a minimum thickness of 0.62 inches.

2.12. Grounding

2.12.1. Ground Rod

Ground Rod shall be composite shaft consisting of a pure copper exterior (5 mil minimum) that has been inseparably molten welded to a steel core. Ground Rod shall have a minimum diameter of 5/8 inch, a minimum length of 8 feet and shall be manufactured for the sole purpose of providing electrical grounding.

2.12.2. Ground Rod Clamp

Ground rod shall be equipped with a one piece cast copper or bronze body with a non-ferrous hexagonal head set screw and designed to accommodate a 10 AWG solid through 2 AWG stranded grounding conductor.

2.13. Grout

2.13.1. Grout for Inductive Loop Installation

Grout for inductive loop installation shall be non-shrink, shall meet the requirements of the *Standard Specifications for Road and Bridge Construction*,

and shall be included on the KYTC Division of Materials, *List of Approved Materials*.

2.13.2. Grout for Piezoelectric Sensor Installation

Grout for piezoelectric sensor installation shall be per the piezoelectric sensor manufacturer's recommendation. Grout shall be suitable for installation in both asphalt and Portland cement pavements. Grout shall have a short curing time (tack free in ten minutes; open to traffic in forty minutes; and fully cured within sixty minutes) to prevent unnecessary lane closure time and should be of sufficient consistency to prevent running when applied on road surfaces with a drainage cross slope. Particulate matter within the grout shall not separate or settle and the grout shall not shrink during the curing process.

2.14. Hardware

Except where specified otherwise, all hardware such as nuts, bolts, washers, threaded ends of fastening devices, etc. with a diameter less than 5/8 inch shall be passivated stainless steel, alloy type 316 or type 304. Stainless steel hardware shall meet ASTM F593 and F594 for corrosion resistance. All other nuts and bolts shall meet ASTM A307 and shall be galvanized.

2.14.1. Conduit Strap

Conduit strap shall be double-hole, stainless steel, and sized to support specified conduit. Conduit strap shall attach to wood pole or post with two 2 ¼ inch wood screws.

2.14.2. Mounting Strap for Pole Mount Cabinet

Mounting strap for pole mount cabinet shall be ¾ inch x 0.03 inch stainless steel; equipped with clips or buckles to securely hold strap.

2.14.3. Metal Framing Channel and Fittings

Metal framing channel shall be 1 5/8 inches wide galvanized steel that conforms to ASTM A1011 and ASTM A653. One side of the channel shall have a continuous slot with in-turned edges to accommodate toothed fittings.

Fittings shall be punch pressed from steel plates and conform to ASTM A575 and the physical requirements of ASTM A1011.

2.15. Junction Box

2.15.1. Junction Box Type A, B, or C

Junction Box Type A, B, or C shall meet or exceed ANSI/SCTE 77-2007, Tier 15. Box shall have an open bottom. A removable, non-slip cover marked "PLANNING" shall be equipped with a lifting slot and attached with a minimum of two 3/8 inch stainless steel hex bolts and washers. Type A Box shall have nominal inside dimensions of 13 inches wide by 24 inches long by 18 inches deep. Type B Box shall have nominal inside dimensions of 11 inches wide by 18 inches long by 12

inches deep. Type C Box shall have nominal inside dimensions of 24 inches wide by 36 inches long by 30 inches deep.

2.15.2. Aggregate for Junction Box Type A, B, or C

Aggregate for junction box type A, B, or C shall be gradation size no. 57 and conform to the *Standard Specifications for Road and Bridge Construction*.

2.15.3. Junction Box 10x8x4

Junction Box Type 10x8x4 shall be constructed of a UV-stabilized, nonmetallic material or non-rusting metal and be weatherproof in accordance with NEMA 4X. Box shall be equipped with an overhanging door with a continuous durable weatherproof gasket between the body and door. Door shall be hinged with screws, hinge(s) and pin(s) and shall be equipped with a padlockable latch on the side opposite the hinge(s). Junction Box 10x8x4 shall have minimum inside dimensions of 10 inches high by 8 inches wide by 4 inches deep.

2.16. Maintain and Control Traffic

Materials for the bid item Maintain and Control Traffic shall conform to the *Standard Specifications for Road and Bridge Construction,* and the KYTC Department of Highways *Standard Drawings*.

2.17. Piezoelectric Sensor

Piezoelectric sensor (piezo) shall provide a consistent level voltage output signal when a vehicle axle passes over it, shall have a shielded transmission cable attached, and shall meet the following requirements:

- Dimensions: such that sensor will fit in a ¾ inch wide by 1 inch deep saw cut. Total length shall be 6 feet unless specified otherwise.
- Output uniformity: ± 7% (maximum)
- Typical output level range: 250mV (minimum) from a wheel load of 400 lbs.
- Working temperature range: -40° to 160° F.
- Sensor life: 30 million Equivalent Single Axle Loadings (minimum)

Shielded transmission cable shall be coaxial and shall meet the following requirements:

- RG 58C/U with a high density polyethylene outer jacket rated for direct burial
- Length shall be a minimum of 100 feet. Installations may exceed 100 feet so the piezo shall be supplied with a lead-in of appropriate length so that the cable can be installed splice-free from the piezo to the cabinet.
- Soldered, water resistant connection to the sensor.

One installation bracket for every 6 inches of sensor length shall also be supplied. Piezo shall be a RoadTrax BL Class I or approved equal.

2.18. Saw Slot Sealant

Saw Slot Sealant shall be non-shrink, non-stringing, moisture cure, polyurethane

encapsulant suitable for use in both asphalt and concrete pavements. It shall provide a void-free encapsulation for detector loop cables and adequate compressive yield strength and flexibility to withstand heavy vehicular traffic and normal pavement movement.

The cured encapsulant shall meet or exceed the following:

- Hardness (Indentation): 35-65 Shore A, ASTM D2240
- Tensile Strength: 150 psi minimum, ASTM D412
- Elongation: 125% minimum 2 inch/minute pull, ASTM D412
- Tack-free Drying Time: 24 hours maximum, ASTM C679
- Complete Drying Time: 30 hours maximum, KM 64-447
- Chemical Interactions (seven day cure at room temperature, 24-hour immersion, KM 64-446):
  - Motor Oil: No effect
  - Deicing Chemicals: No effect
  - Gasoline: Slight swell
  - Hydraulic Brake Fluid: No effect
  - Calcium Chloride (5%): No effect

2.19. Seeding and Protection

Material for Seeding and Protection shall be Seed Mixture Type I and conform to the *Standard Specifications for Road and Bridge Construction*.

2.20. Signs

Materials for signs shall conform to the *Standard Specifications for Road and Bridge Construction.*

2.21. Splicing Materials

2.21.1. Electrical Tape

Electrical tape shall be a premium grade, UL-listed, all-weather, vinyl-insulating tape with a minimum thickness of 7 mil. Tape shall be flame retardant and resistant to abrasion, moisture, alkalis, acids, corrosion, and weather (including ultraviolet exposure).

2.21.2. Splice Kit

Splice kit shall be inline resin-type and rated for a minimum of 600V. Resin shall be electrical insulating-type and shall provide complete moisture and insulation resistance.

2.22. Steel Reinforcing Bar

Steel reinforcing bar shall be #5 and shall conform to the *Standard Specifications for Road and Bridge Construction.*

2.23. Terminal Block

Terminal block shall be rated for a minimum of 300 V and have a minimum of six

terminal pairs with 9/16-inch nominal spacing (center to center) for connecting loop and piezoelectric sensor wires to cable assemblies. Terminal block shall have screw type terminal strips to accommodate wire with spade-tongue ends.

2.24. Warning Tape

Warning tape shall be acid and alkali resistant formulated for direct burial. Tape shall be a minimum of 3 inches wide by 4.0 mils (nominal) thick, and shall be permanently imprinted with a minimum 1 inch black legend on a red background warning of an electric line. Tape shall meet or exceed the following industry specifications:

- American Gas Association (AGA) 72-D-56
- American Petroleum Institute (API) RP 1109
- American Public Works Association (APWA) Uniform Color Code
- Department of Transportation (DOT) Office of Pipeline Safety USAS B31.8
- Federal Gas Safety Regulations S 192-321 (e)
- General Services Administration (GSA) Public Buildings Service Guide: PBS 4-1501, Amendment 2
- National Transportation Safety Board (NTSB) PSS 73-1
- Occupational Safety and Health Administration (OSHA) 1926.956 (c) (1)

2.25. Wire and Cable

All cable and wire shall be plainly marked in accordance with the National Electrical Code (NEC).

2.25.1. Loop Wire

Loop wire shall be 14 AWG, stranded, copper, single conductor, and shall conform to the International Municipal Signal Association (IMSA) Specification No. 51-7.

2.25.2. Cable No. 14/1 Pair

Cable No. 14/1 pair loop lead-in cable shall be 14 AWG, stranded, copper paired, electrically shielded conductors, and shall conform to IMSA 19-2.

2.25.3. Grounding conductor

Grounding conductor and bonding jumper shall be solid or stranded, 4 AWG bare copper.

2.25.4. Service Entrance Conductor

Service entrance conductor shall be stranded, copper, Type USE-2, sized as required to comply with the NEC.

2.25.5. Terminal for electrical wire or cable

Terminal for electrical wires or cables shall be insulated, solderless, spade tongue terminals of correct wire and stud size. Terminal for electrical wires or cables shall be incidental to the wire or cable (including piezoelectric sensor transmission cable) to be connected to terminal strips.

2.26. Wood Post

Wood post shall be Southern Pine pretreated to conform to the American Wood Preservers' Association (AWPA) C-14 or UC4B and shall have minimum dimensions of 4 inches by 4 inches by 8 feet long (for Galvanized Steel Cabinet) or 4 feet long (for Junction Box 10x8x4), sawed on all four sides with both ends square.

2.27. Wooden Pole

Wooden pole shall be a Class IV wood pole of the length specified and shall conform to the *Standard Specifications for Road and Bridge Construction* except the pole shall be treated in accordance with AWPA P9 Type A.

3. CONSTRUCTION METHODS

The plans indicate the extent and general arrangement of the installation and are for guidance. When the Contractor deems any modifications to the plans or specifications necessary, details of such changes and the reasons shall be submitted in writing to the engineer for written approval prior to beginning the modified work.

After the project has been let and awarded, the Division of Construction shall notify the Division of Planning of the scheduled date for a Pre-Construction meeting so that prior arrangements can be made to attend. This will allow the Division of Planning an opportunity to address any concerns and answer any questions that the Contractor may have before beginning the work.

The Division of Planning Equipment Management Team (502-564-7183) shall be notified a minimum of seven days before any work pertaining to these specifications begins to allow their personnel the option to be present during installation.

Unless otherwise specified, installed materials shall be new.

Construction involving the installation of loops or piezoelectric sensors shall not be performed when the temperature of the pavement is less than 38ºF.

A final inspection will be performed by a member of the Central Office Division of Planning equipment staff after the installation is complete to verify that the installation is in compliance with the plans and specifications.

Any required corrective work shall be performed per the *Standard Specifications for Road and Bridge Construction.*

3.1. Anchoring

Furnish: Anchor, anchor rod, guy wire, strand vise, guy guard.

Anchor shall be installed in relatively dry and solid soil. Rock anchor shall be installed in solid rock. Excavate the hole at a 45° to 60° angle in line with the guy (hole size shall be slightly larger than the expanded anchor – see manufacturer's recommendation). Attach rod to anchor, install assembly into hole, and expand anchor. Backfill and tamp entire disturbed area. The effectiveness of the anchor is dependent upon the thoroughness of backfill tamping. Attach guy to strand vise on pole and anchor rod and tighten to required tension. Install guy guard on guy.

3.2. Bore and Jack Pipe – 2"

Furnish: Steel Encasement Pipe, 2"

Bore and jack pipe – 2" shall conform to the Section 706 of the *Standard Specifications for Road and Bridge Construction*.

3.3. Cleanup and Restoration

Furnish: Seed Mix Type 1 (as required); fertilizer (as required); agricultural limestone (as required); mulch or hydromulch (as required); tackifier (as required).

The Contractor shall be responsible for repairing any damage to public and/or private property resulting from his work. Upon completion of the work, restore all disturbed highway features in like kind design and materials. This shall include filling any ruts and leveling ground appropriately. Contractor shall dispose of all waste and debris off the project. Sow all disturbed earthen areas with Seed Mix Type 1 per Section 212 of the *Standard Specifications for Road and Bridge Construction*. All materials and labor necessary for cleanup and restoration shall be considered incidental to other bid items.

3.4. Conduit

Furnish: Conduit; conduit fittings; bushings (grounding where required); LB condulets (as required); weatherheads (as required); conduit straps; hardware; conduit sealant.

Conduit that may be subject to regular pressure from traffic shall be laid to a minimum depth of 24 inches below grade. Conduit that will not be subject to regular pressure from traffic shall be laid to a minimum depth of 18 inches below grade.

Conduit ends shall be reamed to remove burrs and sharp edges. Cuts shall be square and true so that the ends will butt together for the full circumference of the conduit. Tighten couplings until the ends of the conduit are brought together. Do not leave exposed threads. Damaged portions of the galvanized surfaces and untreated threads resulting from field cuts shall be painted with an Engineer-approved, rust inhibitive paint. Conduit bends shall have a radius of no less than 12 times the nominal diameter of the conduit, unless otherwise shown on the plans.

Contractor shall install a bushing (grounding bushing where required) on both ends of all conduits. Cap spare conduits on both ends with caps or conduit sealant.

Conduit openings in junction boxes and cabinets shall be waterproofed with a flexible, removable conduit sealant, working it around the wires, and extending it a minimum 1 inch into the end of the conduit.

After the conduit has been installed and prior to backfilling, the conduit installation shall be inspected and approved by the Engineer.

3.5. Electrical Service

Furnish: Meter base, service disconnect, wire, GFCI AC duplex receptacle with box and cover; conduit, conduit fittings, bushings (grounding where required); LB condulets (as required); weatherhead; conduit straps; hardware; conduit sealant; ground rod with clamp; grounding conductor.

Prior to any construction, the Contractor shall initiate a work order with the local power

company for the installation of electrical service to the site. A representative from the Division of Planning and the local power company shall be consulted prior to choosing an exact location for the pole. The Contractor shall clear the right-of-way for the electrical service drop.

Contractor shall obtain electrical inspections, memberships, meter base, service disconnect and any other requirements by the utility serving the installation and pay all fees as required.

Install meter-base and disconnect panel with a 30-ampere, fused, circuit breaker inside. Install a manufactured weatherproof hub connector to connect the conduit to the top of the meter base and service disconnect.

Install a rigid ¾ inch conduit with three 8 AWG service conductors from the cabinet, through the service disconnect to the meter base and a 1¼" conduit with three 8 AWG service conductors from the meter base to a weatherhead two feet from the top of the electrical service pole. Install conduit straps 30 inches on center and provide a drip loop where the wire enters the weatherhead. Splice electric drop with service entrance conductors at the top of the pole.

The limit of conduit incidental to "Install Electrical Service" for a pad mounted cabinet is 24 inches beyond face of service pole.

Install a 120-volt, 20-amp GFCI AC duplex receptacle with box and cover in the automatic data recorder (ADR) cabinet.

Install a ground rod with clamp. Install a grounding conductor wire from the meter base, through the disconnect panel, to the ground rod clamp. Install grounding conductor in 1-¾" conduit from service disconnect to ground rod.

After completing the installation and before the electrical service is connected, obtain a certificate of compliance from the Kentucky Department of Housing, Buildings and Construction, Electrical Inspection Division.

3.6. Flashing Arrow

Furnish: Arrow Panel

Construction of Flashing Arrow shall conform to the *Standard Specifications for Road and Bridge Construction.*

3.7. Galvanized Steel Cabinet

Furnish: Cabinet; wood posts; concrete; conduit fittings; metal framing channel; pipe clamp; terminal block(s); spade tongue wire terminals; wire labels; hardware.

Where right-of-way allows, locate the cabinet such that it is outside the clear zone in accordance with the *Roadside Design Guide*. Install Cabinet such that the door of the

cabinet faces the roadway.

Excavate as required and install wood posts to a depth of 36 inches and place concrete around posts as shown on the standard detail sheets. Install metal framing channel with pipe clamp between posts.

Install Cabinet on wood posts 38 inches above the finished grade as shown on the standard detail sheets. Install a unistrut between posts when two posts are specified.

Install the required number of terminal blocks on the cabinet back plate. Install a spade tongue terminal on each loop and piezo sensor wire entering the cabinet and connect wires to terminal block(s). Wiring shall be neat and orderly. Label all wires and cables inside cabinet.

Install conduit from ground to cabinet and attach to pipe clamp. Install locknuts to attach conduit to cabinet and install a conduit bushing as shown on the standard detail sheets.

3.8. Grounding

Furnish: Ground rod with clamp; grounding conductor.

At sites with electrical or solar service, all conduits, poles, and cabinets shall be bonded to ground rods and the electrical system ground to form a complete grounded system.

Install such that top of ground rod is a minimum of 3 inches below finished grade.

Grounding systems shall have a maximum 25 ohms resistance to ground. If the resistance to ground is greater than 25 ohms, two or more ground rods connected in parallel shall be installed. Adjacent ground rods shall be separated by a minimum of 6 feet.

3.9. Install Pad Mount Enclosure

Furnish: Concrete; anchor bolts with washers and nuts; conduit; conduit fittings; conduit grounding bushings; ground rod with clamp; grounding conductor; conduit sealant; wooden stakes (where required); wire labels; hardware.

The Contractor shall be responsible for securing the enclosure from the Central Office Division of Planning Warehouse in Frankfort and transporting it to the installation site.

Where right-of-way allows, locate the enclosure such that it is outside the clear zone in accordance with the *Roadside Design Guide*.

Excavate as required, and place concrete to construct the enclosure foundation as specified on the standard detail sheets. Install enclosure on the concrete base such that the door(s) of the enclosure opens away from traffic (hinges away from traffic). Install anchor bolts, washers, and nuts to secure the enclosure to the foundation.

Install ground rod with clamp and install one ¾ inch rigid conduit from enclosure base to

ground rod. Install a grounding conductor from ground rod to enclosure base and bond to each conduit bushing in the base.

Install one ¾ inch rigid steel conduit for electrical service from the base of the enclosure to 24 inches beyond the concrete base. Make all field wiring connections to the electrical service, as applicable.

If electrical service is not provided as a bid item in the contract, plug conduit on both ends with a cap, conduit sealant, or electrical tape. Mark the location of the buried conduit end with a wooden stake labeled "3/4 in. conduit."

Install specified rigid steel conduit(s) into the base of the enclosure for sensor wire entry. Install one spare 2-inch conduit from the enclosure base to 2 feet beyond the concrete base. Plug spare conduit on both ends with a cap, conduit sealant or electrical tape.

The limit of all conduits incidental to "Install Pad Mount Enclosure" is 24 inches beyond the edge of the concrete base.

Wiring in enclosure shall be neat and orderly. Label all wires and cables inside enclosure. KYTC personnel will furnish and install terminal blocks and connect sensors to terminal blocks.

3.10. Install Controller Cabinet

Furnish: Mounting brackets; mounting straps; conduit; LB condulets; conduit fittings; conduit grounding bushings; ground rod with clamp; grounding conductor; cable staples; conduit sealant; wooden stakes (where required); wire labels; hardware.

The Contractor shall be responsible for securing the cabinet from the Central Office Division of Planning Warehouse in Frankfort and transporting it to the installation site. Any existing holes in the cabinet not to be reused shall be covered or plugged to meet NEC requirements.

Install mounting brackets and secure cabinet to pole with mounting straps.

Install a ground rod with clamp. Install grounding conductor in 1-¾" conduit form cabinet to ground rod.

Install one ¾ inch rigid steel conduit with two lb. condulets from cabinet to electrical service disconnect box. Make all field wiring connections to the electrical service, as applicable.

If electrical service is not provided as a bid item in the contract, plug conduit on both ends with cap, plumbers putty, conduit sealant, or electrical tape. Mark the location of the buried conduit end with a wooden stake labeled "3/4 in. conduit".

Install specified rigid steel conduit(s) and type LB condulet(s) into the bottom of the

cabinet for sensor wire entry. The limit of conduits incidental to "Install Controller Cabinet" is 24 inches beyond the face of the pole.

Wiring in cabinet shall be neat and orderly. Label all wires and cables inside cabinet. KYTC personnel will furnish and install terminal blocks and connect sensors to terminal blocks.

3.11. Junction Box Type 10x8x4

Furnish: Junction box; wood post; conduit fittings; wire labels; hardware.

Where right-of-way allows, locate the junction box such that it is outside the clear zone in accordance with the Roadside Design Guide.

Excavate as required and install wood post(s) to a depth of 18 inches. Install junction box on wood post such that the bottom of the box is 18 inches above the finished grade as shown on the standard detail sheets. Box shall be installed with four (4) 2½ inch wood screws and washers.

Install locknuts to attach conduit to junction box and install a conduit bushing as shown on the standard detail sheets.

Wiring inside box shall be neat and orderly. Label all wires and cables inside box.

3.12. Junction Box Type A, B, or C

Furnish: Junction box, No. 57 aggregate; grounding conductor

Excavate as required and place approximately 12 inches of No. 57 aggregate beneath the proposed junction box to allow for drainage. Install specified junction box type A, B, or C near the edge of pavement, flush with finished grade per the detail sheets. Where required, orient the box so that the dimensions comply with the National Electrical Code. Stub conduits with grounding bushings into junction box at its base to accommodate wires and connect grounding conductor to all grounding bushings. Backfill to existing grade, and restore disturbed area to the satisfaction of the Engineer.

Wiring inside box shall be neat and orderly. Label all wires and cables inside box.

3.13. Loops - Proposed

Furnish: Wire; saw slot sealant; backer rod; grout; conduit sealant.

The plans and notes specify the approximate location for loop installations. Prior to sawing slots or drilling cores, the Contractor shall meet with a representative of the Division of Planning to verify the precise layout locations on site. Avoid expansion joints and pavement sections where potholes, cracks, or other roadway flaws exist.

Upon completion of this meeting, the Contractor shall measure out and mark the proposed loop locations with spray paint or chalk such that the saw slots will be parallel

and perpendicular to the direction of traffic. Marked lines shall be straight and exact to the locations determined and sized as shown on the plans. Unless indicated otherwise, loops shall be 6 feet by 6 feet square and loops in the same lane shall be spaced 16 feet from leading edge to leading edge.

On resurfacing, rehabilitation, and new construction projects that include new asphalt pavement, the Contractor shall install loops prior to laying the final surface course. On projects with milling and texturing, the Contractor may install the loops prior to or after the milling operation; however, if installed prior to milling, the Contractor shall be responsible for ensuring that the loops are installed at a depth such that the milling operation will not disturb the newly installed loops. The Contractor shall correct damage caused by the milling operations to newly installed loops prior to placement of the final surface course at no additional cost to the Cabinet.

For projects that include the installation of new asphalt and piezoelectric sensors, the Contractor shall mark or otherwise reference all loops installed prior to the final surface course such that the loops can be accurately located when the piezoelectric sensors are installed after placement of the final surface course.

For projects that do not have asphalt surfacing, the Contractor shall install the loops in the surface of the pavement.

The Prime Contractor shall coordinate the installation of loops with the electrical sub-Contractor and the Engineer to ensure correct operation of the completed installation.

The following is a typical step by step procedure for the installation of a loop.

- Carefully mark the slot to be cut, perpendicular to the flow of traffic and centered in the lane.
- Make each saw-cut 3/8-inch wide and at a depth such that the top of the backer rod is a minimum of 2 inches below the surface of rigid (PCC/Concrete) pavement or 4 inches below the surface of asphalt pavement.
- Drill a 1½ inch core hole at each corner and use a chisel to smooth corners to prevent sharp bends in the wire.
- Clean ALL foreign and loose matter out of the slots and drilled cores and within 1 foot on all sides of the slots using a high-pressure washer.
- Completely dry the slots and drilled cores and within 1 foot on all sides of the slots using oil-free forced air, torpedo heaters, electric heaters, or natural evaporation, depending on weather conditions. Be very careful not to burn the asphalt if heat is used.
- Measure 9-12 inches from the edge of the paved surface (shoulder break or face of curb) and drill a 1½ inch hole on a 45º angle to the conduit adjacent to the roadway.
- Closely inspect all cuts, cores, and slots for jagged edges or protrusions prior to the placement of the wire. All jagged edges and protrusions shall be ground or re-cut and cleaned again.

- Place the loop wire splice-free from the termination point (cabinet or junction box) to the loop, continue around the loop for four turns, and return to the termination point.
- Push the wire into the saw slot with a blunt object such as a wooden stick. Make sure that the loop wire is pushed fully to the bottom of the saw slot.
- Install conduit sealant to a minimum of 1" deep into the cored 1½ inch hole.
- Apply loop sealant from the bottom up and fully encapsulate the loop wires in the saw slot. The wire should not be able to move when the sealant has set.
- Cover the encapsulated loop wire with a continuous layer of backer rod along the entire loop and home run saw slots such that no voids are present between the loop sealant and backer rod.
- Finish filling the saw cut with non-shrinkable grout per manufacturer's instructions. Alleviate all air pockets and refill low spaces. There shall be no concave portion to the grout in the saw slot. Any excess grout shall be cleaned from the roadway to alleviate tracking.
- Clean up the site and dispose of all waste off the project.
- Ensure that the grout has completely cured prior to subjecting the loop to traffic. Curing time varies with temperature and humidity.

Exceptions to installing loop wire splice-free to the junction box or cabinet may be considered on a case-by-case basis and must be pre-approved by the Engineer. If splices are allowed, they shall be located in a junction box and shall conform to the construction note for Splicing.

If loop lead-in cable (Cable No. 14/1 Pair) is specified, cable shall be installed splice free to the cabinet ensuring that extra cable is left in each junction box or cabinet. All wires and cables shall be labeled in each junction box and cabinet.

Loop inductance readings shall be between 100 and 300 microhenries. The difference of the loop inductance between two loops in the same lane shall be ±20 microhenries. Inductance loop conductors shall test free of shorts and grounds. Upon completion of the project, all loops must pass an insulation resistance test of a minimum of 100 million ohms to ground when tested with a 500 Volt direct current potential in a reasonably dry atmosphere between conductors and ground.

3.14. Loop Test

When noted on a data collection station layout sheet that there are existing inductive loops within the limits of the project, notify the Engineer in writing, a minimum of 14 calendar days prior to beginning milling operations. After milling and prior to placing asphalt inlay, conduct an operating test on the existing inductance loops at the control cabinet in the presence of the Engineer to determine if the inductance loop conductors have an insulating resistance of a minimum of 100 megohms when tested with a 500-volt direct current potential in a reasonably dry atmosphere between conductors and ground. The Department may also conduct its own tests with its own equipment.

If the tests indicate the loop resistances are above the specified limit and the Engineer determines the system is operable, proceed with the asphalt inlay. If the test indicates the loop resistance is not within the specified limits or if the Engineer determines the system is otherwise not operable, prior to placing the asphalt inlay install and test new loop detectors according to the station layout, notes, and Detail Drawings.

The Engineer will contact and maintain liaison with the District Planning Engineer and the Division of Planning in order to coordinate any necessary work.

3.15. Maintain and Control Traffic

Furnish (all as required): Drums, traffic cones, barricades used for channelization purposes, delineators, and object markers.

Maintain and Control Traffic shall conform to the plans, the Standard Specifications for Road and Bridge Construction, and the KYTC Department of Highways Standard Drawings.

3.16. Open Cut Roadway

Furnish: Concrete, reinforcing bars.

Excavate trench by sawing and chipping away roadway to dimensions as indicated on the detail sheets. After placing conduit, install concrete and steel reinforcing bars per the *Standard Specifications for Road and Bridge Construction*. Restore any disturbed sidewalk to its original condition.

3.17. Piezoelectric Sensor

Furnish: Piezoelectric sensor and cable; sensor support brackets; saw slot sealant; backer rod; grout; conduit sealant.

The plans and notes specify the approximate location for piezoelectric sensor (piezo) installations. Prior to sawing slots or drilling cores, the Contractor shall meet with a representative of the Division of Planning to verify the final layout on site. Avoid expansion joints and pavement sections where potholes, cracks, or other roadway flaws exist. Roadway ruts at the proposed piezo location shall not be in excess of ½ inch under a 4-foot straight edge.

Install the piezo perpendicular to traffic in the final surface course of the pavement. Locate the sensor in the lane as shown on the site layout drawing. Eleven-foot length sensors shall be centered in the lane.

The following is a typical step by step procedure for the installation of a piezo. Refer specifically to the manufacturer's instructions provided with the sensor prior to installation.

- Carefully mark the slot to be cut, perpendicular to the flow of traffic and properly positioned in the lane.

- It is strongly recommended that a ¾ inch wide diamond blade be used for cutting the slot, or that blades be ganged together to provide a single ¾ inch wide cut. The slot shall be wet cut to minimize damage to the pavement.
- Cut a slot ¾ inch wide (±1/16 inch) by 1 inch minimum deep. The slot should be a minimum of 2 inches longer than the sensor (including the lead attachment). Drop the saw blade an extra ½ inch down on both ends of the sensor. The lead out of the passive cable should be centered on the slot.
- Cut the slot for the passive cable ¼ inch wide and at a depth so that the top of the backer rod is a minimum of 2 inches below the road surface.
- Clean ALL foreign and loose matter out of the slot and within 1 foot on all sides of the slot using a high-pressure washer.
- Completely dry the slot and within 1 foot on all sides of the slot using oil-free forced air, torpedo heaters, electric heaters, or natural evaporation, depending on weather conditions. Be very careful not to burn the asphalt if heat is used.
- Measure 9-12 inches from the edge of the paved surface (shoulder break or face of curb) and drill a 1½ inch hole on a 45º angle to the conduit adjacent to the roadway.
- Place strips of 2-4-inch-wide tape strips on the pavement along the lengths of both sides of the sensor slot, 1/8 inch away from the slot.
- Wear clean, protective latex (or equivalent) gloves at all times when handling sensors. Visually inspect sensor to ensure it is straight. Check lead attachment and passive cable for cuts, gaps, cracks and/or bare wire. Verify that the correct sensor type and length is being installed by checking the data sheet. Verify there is sufficient cable to reach the cabinet. Piezo lead-in cable shall not be spliced.
- Test the sensor for capacitance, dissipation factor and resistance, according to the directions enclosed with the sensor. Capacitance and dissipation should be within ±20% of the piezo data sheet. Resistance (using the 20M setting) should be infinite. Record the sensor serial number and the test results and label “pre-installation.” This information should be stored in the counter cabinet and/or returned to Department Planning personnel.
- Lay the sensor next to the slot and ensure that it is straight and flat.
- Clean the sensor with steel wool or an emery pad and wipe with alcohol and a clean, lint-free cloth.
- Place the installation bracket clips every 6 inches along the length of the sensor.
- Bend the tip of the sensor downward at a 30° angle. Bend the lead attachment end down at a 15° angle and then 15° back up until level (forming a lazy Z).
- Place the sensor in the slot, with the brass element 3/8 inch below the road surface along the entire length. The tip of the sensor should be a minimum of 2 inches from the end of the slot and should not touch the bottom of the slot. The top of the plastic installation bracket clips should be 1/8 inch below the surface of the road. The lead attachment should not touch the bottom or sides of the slot. Ensure the sensor ends are pushed down per the manufacturer’s instructions.
- Visually inspect the length of the sensor to ensure it is at uniform depth along its length and it is level (not twisted, canted or bent).

- On the passive cable end, block the end of the slot approximately 3-5 inches beyond the end of the lead attachment area creating an adequate "dam" so that the sensor grout does not flow out.
- Use one bucket of sensor grout per piezo installation. Overfill the slot with sensor grout and allow to cure for a minimum of 10 minutes before continuing with the installation. Ensure that sensor grout fills around and beneath the sensor completely and that there is not a trough on top.
- Remove the tape along the sides of the saw slot when the adhesive starts to cure.
- Carefully remove the dam from the end of the sensor.
- Route the lead-in cable through the saw slot
- Install conduit sealant to a minimum of 1" deep into the cored 1½ inch hole.
- Cover the lead-in cable with encapsulant, backer rod, and grout.
- If necessary, after the grout has hardened, grind with an angle grinder until the profile is a 1/16-inch mound. There shall be no concave portion to the mound.
- Clean up the site and dispose of all waste off the project.
- Ensure that the sensor grout has completely cured prior to subjecting the sensor to traffic. Curing time will vary with temperature and humidity.

Upon installation, test the sensor for capacitance, dissipation factor and resistance, according to the directions enclosed with the sensor. Capacitance and dissipation should be within ±20% of the piezo data sheet. Resistance (using the 20M setting) should be infinite. Perform a functional test of the piezo with an oscilloscope to ensure that the sensor is generating a proper response to the passage of vehicles.

Record the sensor serial number and the test results and label "post-installation." This information should be stored in the counter cabinet and/or returned to Department Planning personnel.

3.18. Pole – Wooden

Furnish: Pole; anchoring equipment (as required); hardware (as required).

Excavate and install wood pole to a minimum depth of one-sixth the total pole height. Place backfill material in hole and compact until flush with existing grade. Install guy wire, guy guard, anchor, anchor rod, and strand vise, if necessary. Anchor shall be a minimum of one-third the pole height from the face of the pole. Provide temporary erosion control, seeding, protection and restoration of disturbed areas to the satisfaction of the Engineer.

3.19. Removal of Existing Equipment

The Contractor shall remove existing materials (including but not limited to: poles, anchors, cabinets, junction boxes, conduit and wire) not to be reused. Contractor shall dispose of all removed materials off the project. All materials and labor necessary for the removal of existing equipment shall be considered incidental to other bid items.

3.20. Signs

Furnish: Signs; sign standards; hardware.

Construction of **s**igns shall conform to the *Standard Specifications for Road and Bridge Construction.*

3.21. Splicing

Furnish: Splice kit; solder.

These notes describe the splicing process (if permitted) and are not intended to grant permission to splice. Permission to splice shall be determined by the Division of Planning and the locations shall be shown on the layout sheet. If splicing is needed but not shown on the layout sheet, the Contractor shall receive prior written approval from the Division of Planning.

All splices shall conform to the provisions of the NEC.

Splices for loop and loop lead-in wire shall be twisted and soldered. Abrade the outer jacket of both wires to promote good adhesion and prevent capillary leak paths. Seal the splice with an electrical sealing resin. Spliced loop conductors shall test free of shorts and unauthorized grounds and shall have an insulating resistance of at least 100 megohms when tested with a 500-volt direct current potential in a reasonably dry atmosphere between conductors and ground.

For piezos, the same type coax cable, supplied by the manufacturer, shall be used to splice to the sensor's lead-in cable. Cables shall be soldered. Abrade the outer jacket of both cables to promote good adhesion and prevent capillary leak paths. Seal the splice with an electrical sealing resin. Spliced piezo cables shall be tested and have a minimum resistance of 20 megohms, a maximum dissipation factor of 0.03, a capacitance within the manufacturer's recommended range based upon the length of additional cable. A functional test of the piezo shall be performed to ensure that the sensor is generating a proper response to the passage of vehicles.

3.22. Trenching and Backfilling

Furnish: Warning tape; seed mix type I; cereal rye or German foxtail-millet; mulch; concrete (as required); asphalt (as required).

Excavate trench and provide required cover as shown on the standard detail sheets. After placing conduit, backfill material shall be placed and compacted in lifts of 9 inches or less. Install warning tape as shown on the detail sheet. Provide temporary erosion control, seeding, protection and restoration of disturbed areas to the satisfaction of the Engineer.

3.23. Wiring

Furnish: Wire; wire labels; spade tongue wire terminals (as required).

Installation of all wiring shall conform to the NEC. Permanent identification numbers

shall be affixed to all wires in all junction boxes and cabinets (see Layout(s) for loop and piezo numbers).

Additional lengths of each loop and piezo sensor wire shall be neatly coiled in all cabinets and junction boxes as follows:

Enclosure Type	Additional length of each wire
Galvanized Steel Cabinet	2' – 3'
Pad Mount Cabinet (332)	6' - 8'
Pole Mount Cabinet (336)	3' - 4'
Junction Box Type 10x8x4	2' – 3'
Junction Box Type A, B, or C	2' – 3'

3.24. Wood Post

Furnish: Wood post; concrete (as required); seed mix type I; cereal rye or German foxtail-millet; mulch.

Excavate hole to specified depth and place concrete, if required. Install post, backfill to existing grade, and tamp backfill. Provide temporary erosion control, seeding, protection and restoration of disturbed areas to the satisfaction of the Engineer.

3.25. Remove and Replace Sidewalk

Furnish: Lumber, stakes, nails or screws, and concrete.

Remove existing sidewalk to install rigid conduit from edge of roadway to nearest junction box or cabinet. Form, pour and finish concrete in place of old existing sidewalk making sure to replace the expansion joints in their respective locations. Concrete shall conform to the *Kentucky Standard Specifications for Road and Bridge Construction* for sidewalks.

4. BID ITEM NOTES AND METHOD OF MEASUREMENT FOR PAYMENT

Only the bid items listed will be measured for payment. All other items required to complete the vehicle detection installation shall be incidental to other items of work. Payment at the contract unit price shall be full compensation for all materials, labor, equipment and incidentals to furnish and install these items.

4.1. Bore and Jack Pipe – 2”

Bore and jack pipe – 2” shall be furnished, installed, and measured for payment per the *Standard Specifications for Road and Bridge Construction*.

4.2. Conduit

Conduit shall include furnishing and installing specified conduit in accordance with the specifications. This item shall include conduit fittings, bodies, boxes, weatherheads, expansion joints, couplings, caps, conduit sealant, electrical tape, clamps, bonding straps and any other necessary hardware. Conduit will be measured in linear feet.

4.3. Electrical Service

Electrical Service shall include furnishing and installing all necessary materials and payment of all fees toward the complete installation of an electrical service which has passed all required inspections. Incidental to this item shall be furnishing and installing:

- Meter-base per utility company’s specifications
- Service disconnect panel per utility company’s specifications
- Meter base and service disconnect entrance hubs, waterproof
- Service entrance conductors
- Rigid steel conduit
- Rigid steel conduit fittings
- Conduit straps
- Weatherhead
- Duplex GFCI receptacle, 120-volt, 20-amp
- Ground rod with clamp
- Grounding conductor

Also incidental to this item shall be any necessary clearing of right of way for the electrical service drop.

Electrical service will be measured in individual units each.

4.4. Flashing Arrow

Flashing Arrow shall be furnished, installed, and measured for payment per the *Standard Specifications for Road and Bridge Construction.*

4.5. Galvanized Steel Cabinet

Galvanized Steel Cabinet shall include furnishing and installing galvanized steel cabinet on post as specified. Incidental to this item shall be furnishing and installing grounding hardware, and any necessary post/pole mounting hardware. Also incidental to this item shall be furnishing and installing the required number of terminal blocks and connection of all

sensors to the terminal blocks. Galvanized Steel Cabinet will be measured in individual units each.

4.6. Install Pad Mount Enclosure

Install Pad Mount Enclosure shall include installing a Department-furnished enclosure as specified on the detail sheets.

This item shall include obtaining the enclosure from KYTC and transporting it to the installation site and furnishing and installing the following:

- Concrete foundation (including any excavation necessary)
- Anchor bolts, lock washers, and nuts
- Conduit
- Conduit fittings (including grounding bushings)
- Weatherhead
- Terminal Strip(s)
- Ground rod with clamp
- Grounding conductor

Install Pad Mount Enclosure will be measured in individual units each.

4.7. Install Controller Cabinet

Install Controller Cabinet shall include installing a Department-furnished cabinet as specified on the detail sheets.

This item shall include obtaining the cabinet from KYTC and transporting it to the installation site and furnishing and installing the following:

- Conduit
- Conduit Fittings
- Terminal Strip(s)
- Ground rod with clamp
- Grounding conductor

Install Controller Cabinet will be measured in individual units each.

4.8. Junction Box Type 10" x 8" x 4"

Junction Box Type 10”x8”x4” shall include furnishing and installing specified junction box in accordance with the specifications. This item shall include connectors, splice sleeves, conduit fittings, mounting materials and any other items required to complete the installation. Incidental to this item shall be furnishing and installing specified post (wood, channel, metal, etc.) as required for the installation. Junction Box Type 10”x8”x4” will be measured in individual units each.

4.9. Junction Box Type A, B, or C

Junction Box Type A, B, or C shall include furnishing and installing specified junction box in accordance with the specifications. This item shall include excavation, furnishing and installing #57 aggregate, backfilling around the box, and restoration of disturbed areas to the satisfaction of the Engineer. Incidental to this item shall be furnishing and installing a

grounding conductor bonding all conduit grounding bushings in the box. Junction Box Type A, B, or C will be measured in individual units each.

4.10. Loop Saw Slot and Fill

Loop Saw Slot and Fill shall include sawing and cleaning saw slots and furnishing and installing conduit sealant, loop sealant, backer rod, grout, or other specified material. Loop Saw Slot and Fill will be measured in linear feet of sawed slot.

4.11. Maintain and Control Traffic

Maintain and Control Traffic shall be measured for payment per the *Standard Specifications for Road and Bridge Construction.*

4.12. Open Cut Roadway

Open Cut Roadway shall include excavating trench (sawing and chipping roadway) to dimensions as indicated on the detail sheets and furnishing and placing concrete, steel reinforcing bars, and asphalt. This item also includes restoring any disturbed sidewalk to its original condition. Open Cut Roadway will be measured in linear feet.

4.13. Piezoelectric Sensor

Piezoelectric sensor (piezo) shall include sawing and cleaning saw slots and furnishing and installing piezo in accordance with the specifications. This item shall include furnishing and installing lead-in wire, conduit sealant, encapsulation material, backer rod, grout, testing, and accessories. Piezo will be measured in individual units each.

4.14. Pole – 35’ Wooden

Pole – 35’ Wooden shall include excavation, furnishing and installing specified wood pole, backfilling and restoring disturbed areas to the satisfaction of the Engineer. Incidental to this item shall be furnishing and installing guy wire, anchor and anchor rod, strand vise, and guy guard, if specified.

Pole – 35’ Wooden will be measured in individual units each.

4.15. Signs

Signs shall be furnished, installed, and measured for payment per the *Standard Specifications for Road and Bridge Construction.*

4.16. Trenching and Backfilling

Trenching and Backfilling shall include excavation, warning tape, backfilling, temporary erosion control, seeding, protection and restoration of disturbed areas to original condition. This item shall include concrete, asphalt or approved replacement material for sidewalks, curbs, roadways, etc. (if required). Trenching and backfilling will be measured in linear feet.

4.17. Wire or Cable

Wire or cable shall include furnishing and installing specified wire or cable within saw slot, conduit, junction box, cabinet, or overhead as indicated on the detail sheets. Incidental to this item shall be the labeling of all wires and cables in each junction box, cabinet and splice

box, and furnishing and installing other hardware required for installing cable. Wire or Cable will be measured in linear feet.

4.18. Wood Post

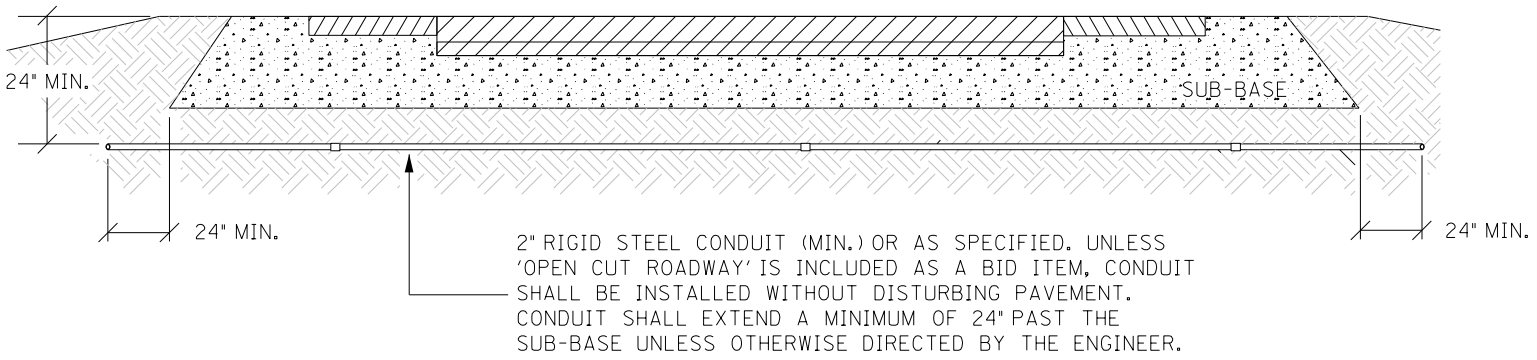
Wood Post shall include furnishing and installing wood post as specified. This item shall include excavation, furnishing and placing concrete (if required), backfilling around the post, and restoration of disturbed areas to the satisfaction of the engineer. Wood Post will be measured in individual units each.

4.19. Remove and Replace Sidewalk

Remove and Replace Sidewalk shall include removing existing sidewalk to install conduit and/or junction box (if required) and replacing old existing sidewalk with new sidewalk after installation of required items. This item includes removing old sidewalk and disposing of off the project and forming, pouring and finishing the new sidewalk after installation of required items.

4.20. Loop Test

Loop Test includes conducting an operating test on the existing inductance loops at the control cabinet in the presence of the Engineer to determine if the inductance loop conductors have an insulating resistance of a minimum of 100 megohms when tested with a 500-volt direct current potential in a reasonably dry atmosphere between conductors and ground.

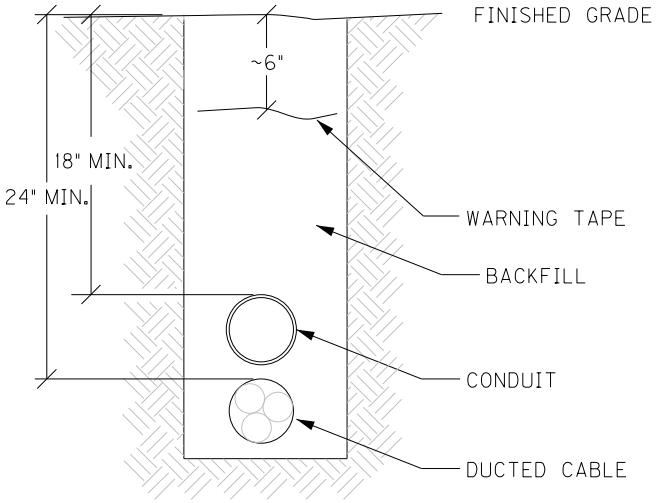


CONDUIT UNDER PAVEMENT

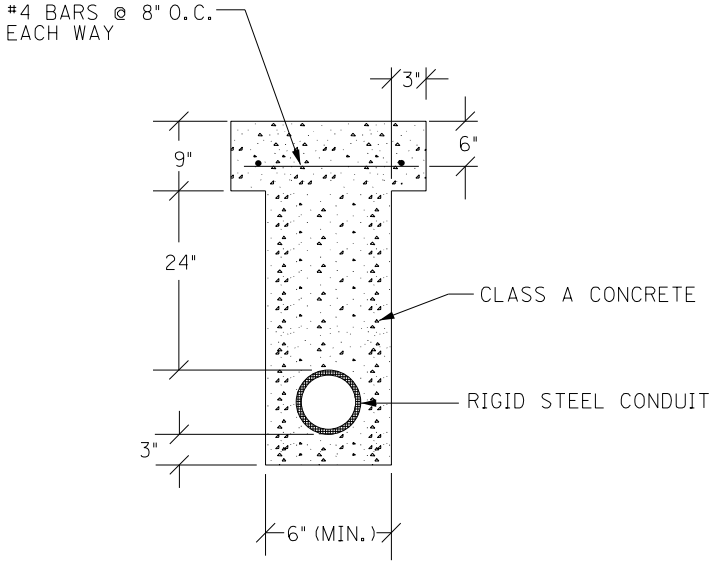
TOTAL TRENCH WIDTH SHALL BE 3" (NOM.) WIDER THAN THE SUM OF THE OUTSIDE DIAMETER(S) OF THE CONDUIT(S) INSTALLED. CONDUIT(S) SHALL BE CENTERED IN TRENCH.

CONTRACTOR SHALL PLACE BACKFILL IN LIFTS (9" MAX.) COMPACT BACKFILL, AND RESTORE DISTURBED AREA TO THE SATISFACTION OF THE ENGINEER

CONTRACTOR SHALL INSTALL UNDERGROUND UTILITY WARNING TAPE ABOVE CONDUIT AS SHOWN.



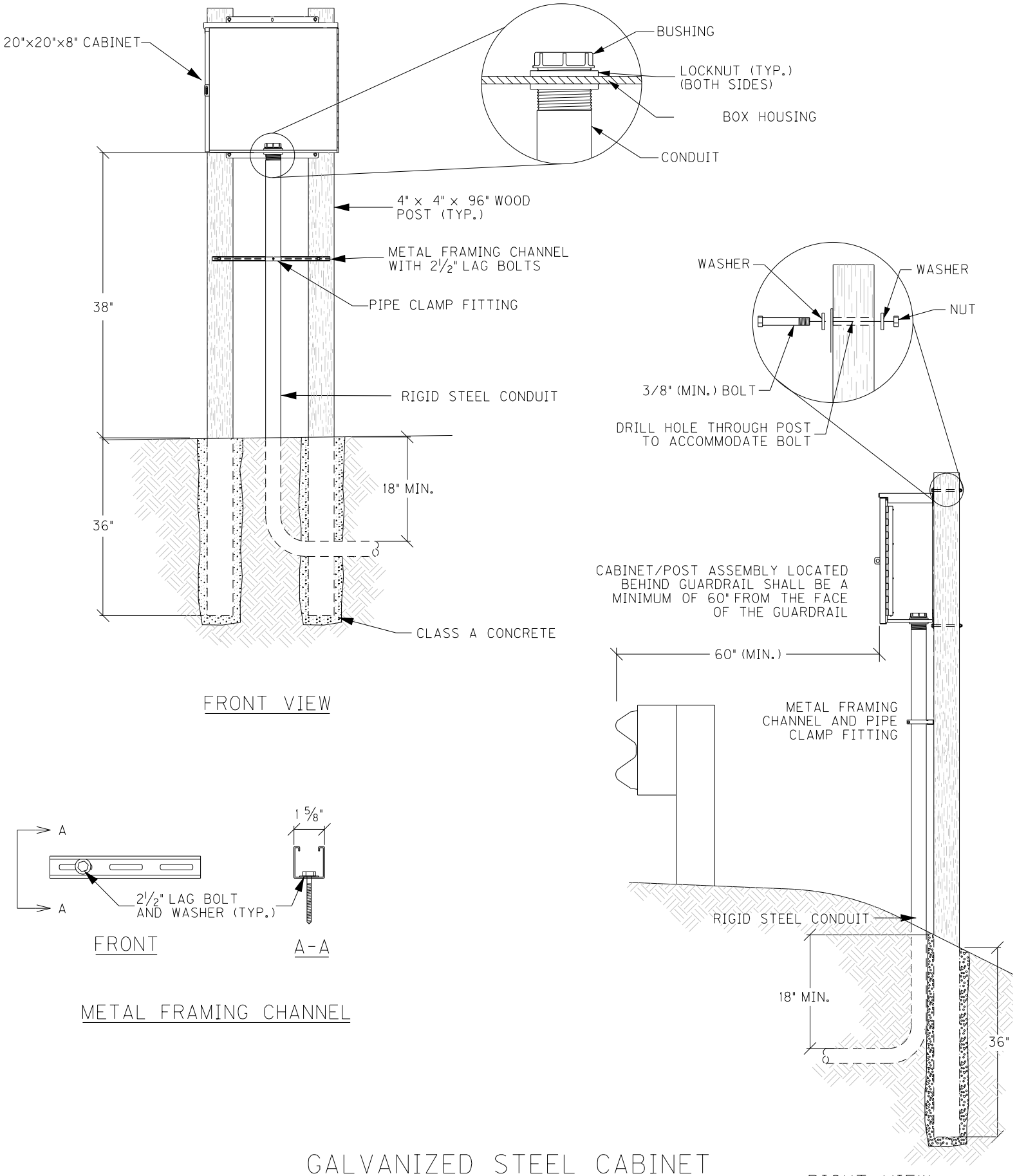
CONDUIT TRENCH



OPEN CUT PAVEMENT DETAIL

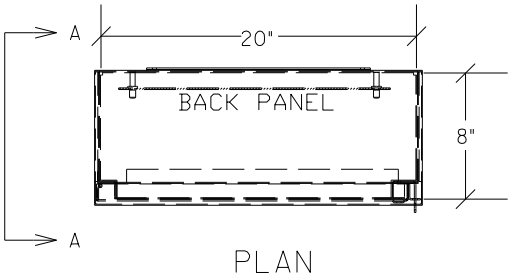
CONDUIT INSTALLATION

NOT TO SCALE

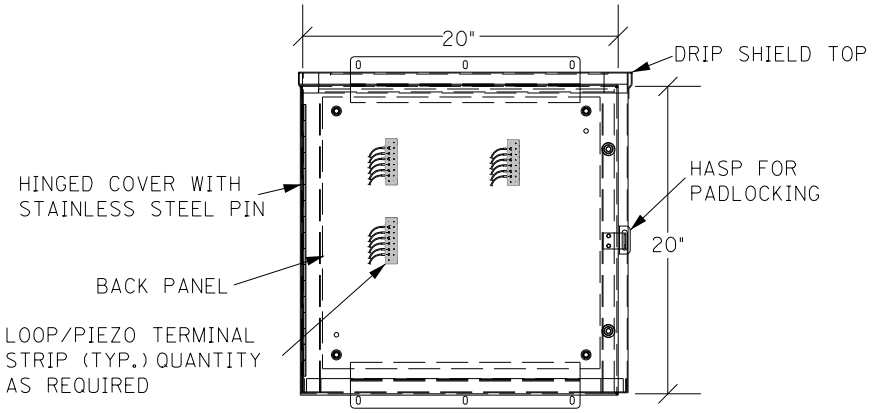


GALVANIZED STEEL CABINET
DOUBLE POST ASSEMBLY

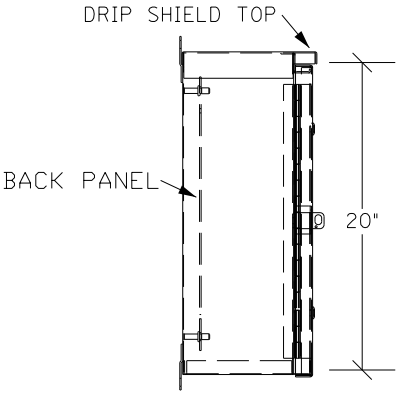
NOT TO SCALE



PLAN

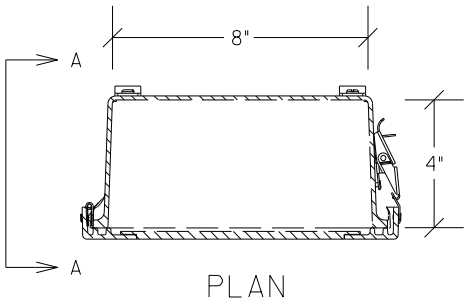


ELEVATION

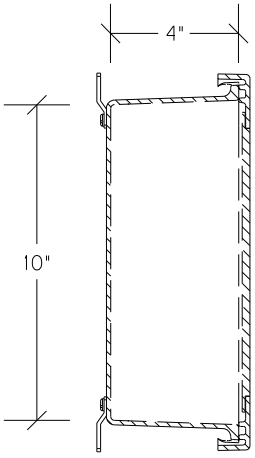


SECTION A-A

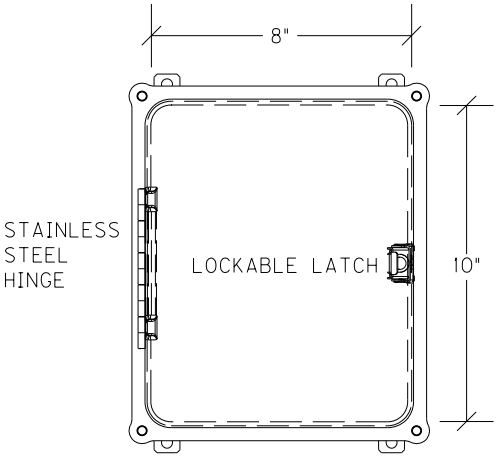
GALVANIZED STEEL CABINET



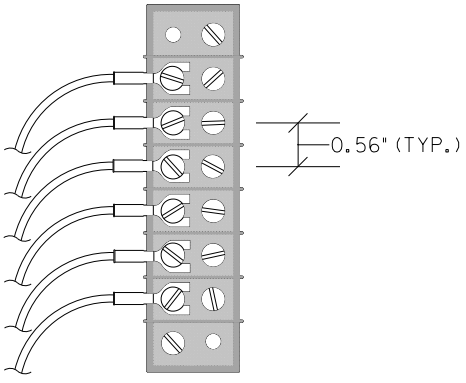
PLAN



SECTION A-A



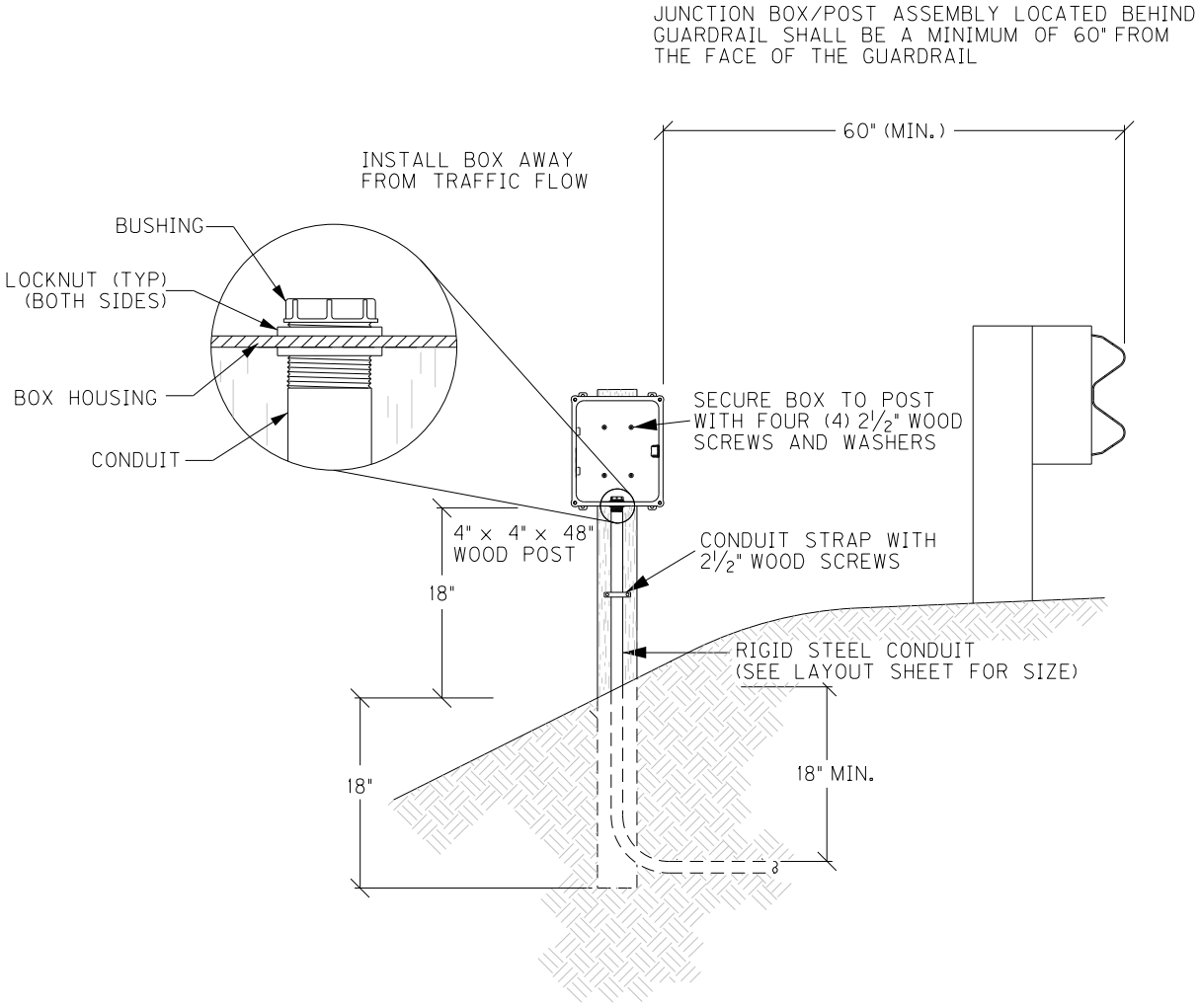
ELEVATION



TERMINAL STRIP (TYP.)

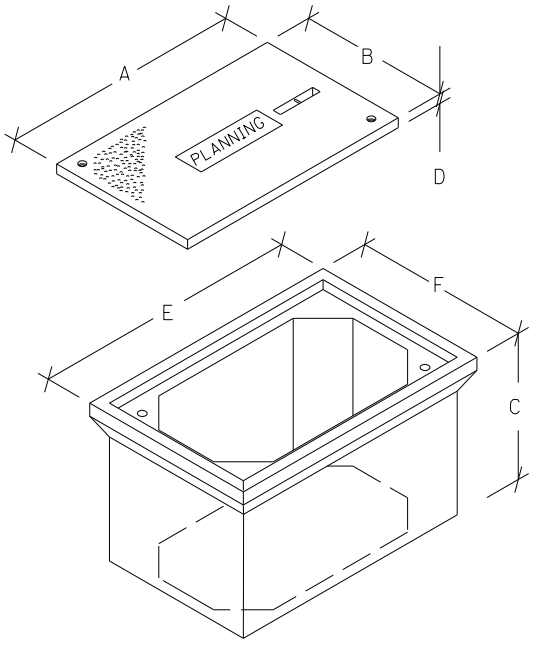
JUNCTION BOX 10"x8"X4"

NOT TO SCALE



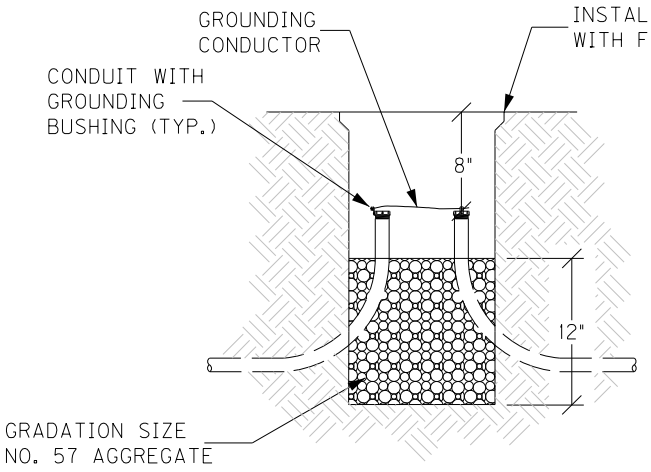
JUNCTION BOX 10"x8"x4" AND POST ASSEMBLY

NOT TO SCALE



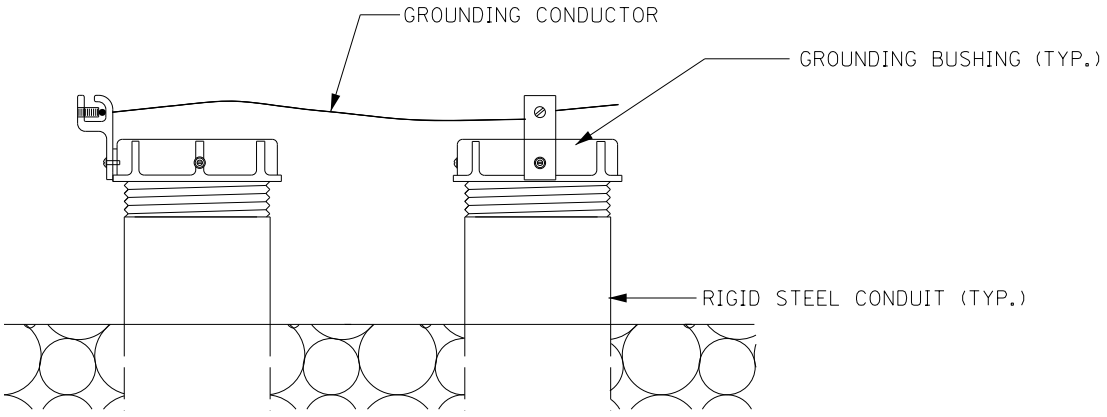
JUNCTION BOX DIMENSIONS (NOMINAL)						
	A	B	C	D*	E	F
TYPE A	23"	14"	18"	2"	25"	16"
TYPE B	18"	11"	12"	1¾"	20"	13"
TYPE C	36"	24"	30"	3"	38"	26"

* MINIMUM
STACKABLE BOXES ARE PERMITTED



WHERE REQUIRED, JUNCTION BOX SHALL BE ORIENTED SUCH THAT THE DIMENSIONS COMPLY WITH THE NATIONAL ELECTRICAL CODE.

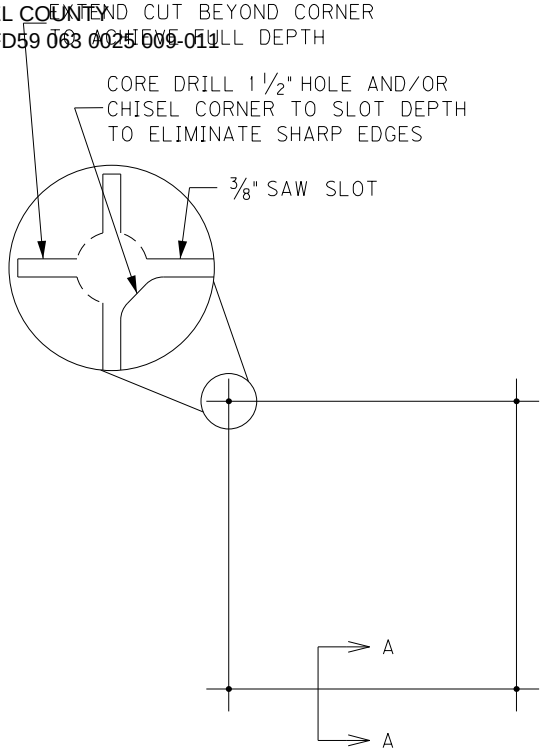
ELEVATION



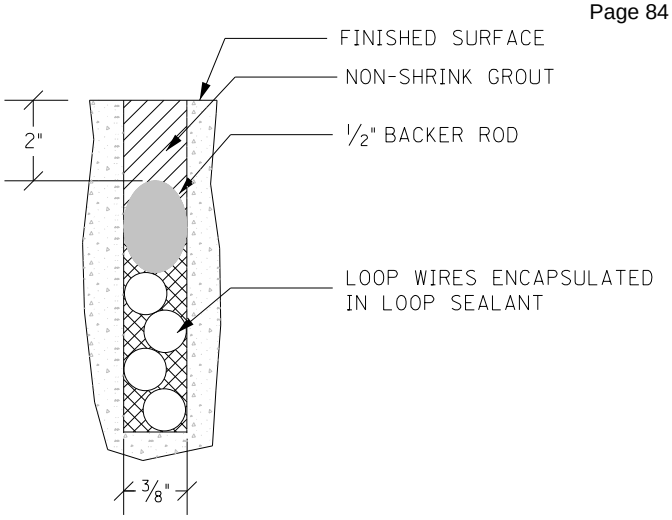
GROUNDING DETAIL

JUNCTION BOX - TYPE A, TYPE B, TYPE C

NOT TO SCALE



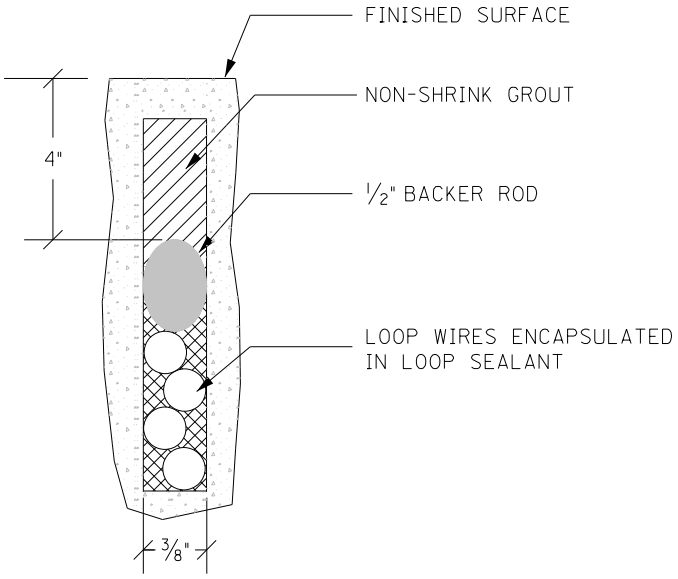
SAW CUT PLAN



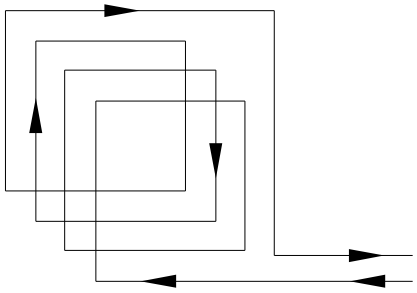
SECTION A-A (CONCRETE)

UNLESS SPECIFIED OTHERWISE, ALL LOOPS SHALL BE 6' x 6' SQUARE, CENTERED IN EACH LANE, WITH FOUR TURNS OF 14 AWG LOOP WIRE.

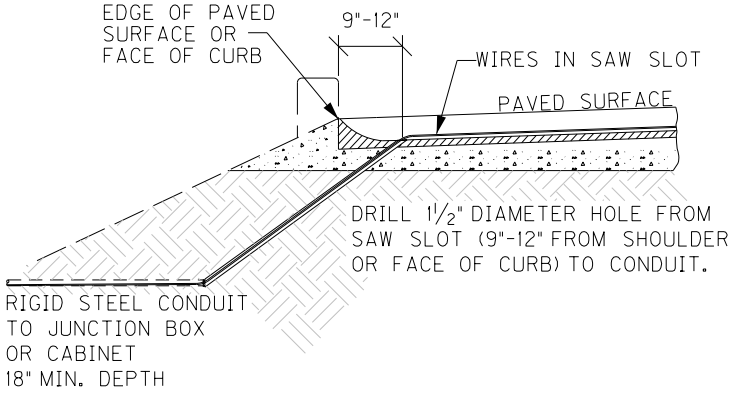
ADJACENT SAW SLOTS SHALL BE A MINIMUM OF 12" APART.



SECTION A-A (ASPHALT)



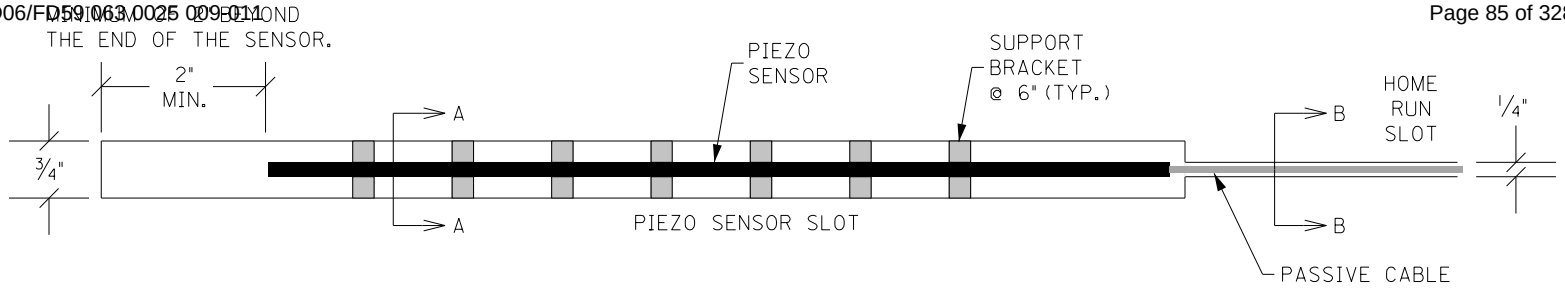
WIRING PLAN



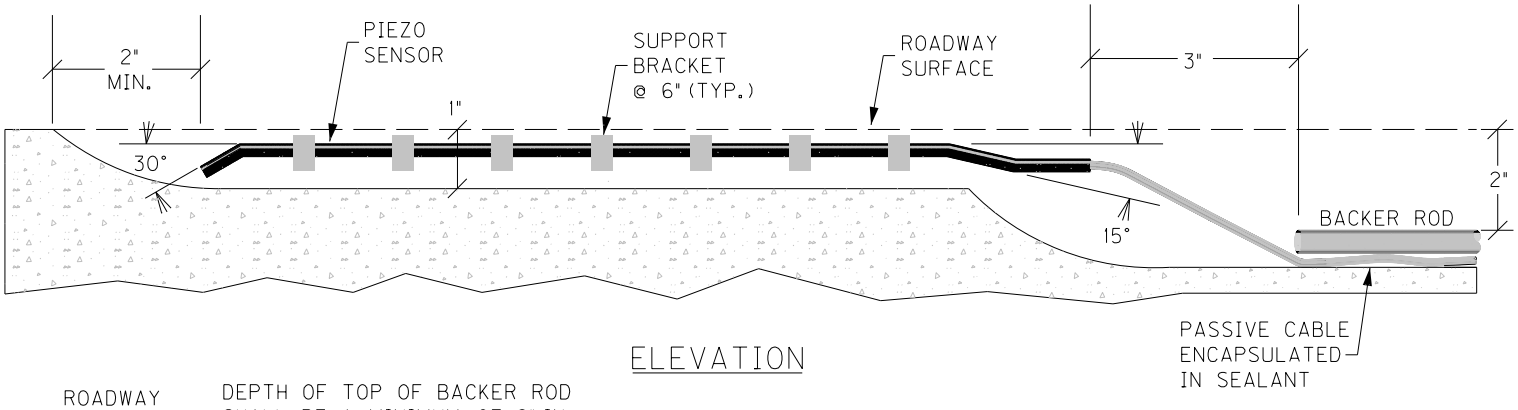
SAW SLOT EDGE OF PAVEMENT TRANSITION

INDUCTIVE LOOP DETECTOR

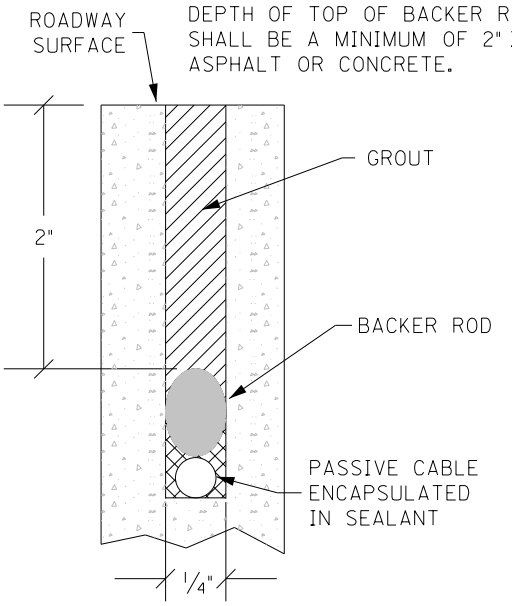
NOT TO SCALE



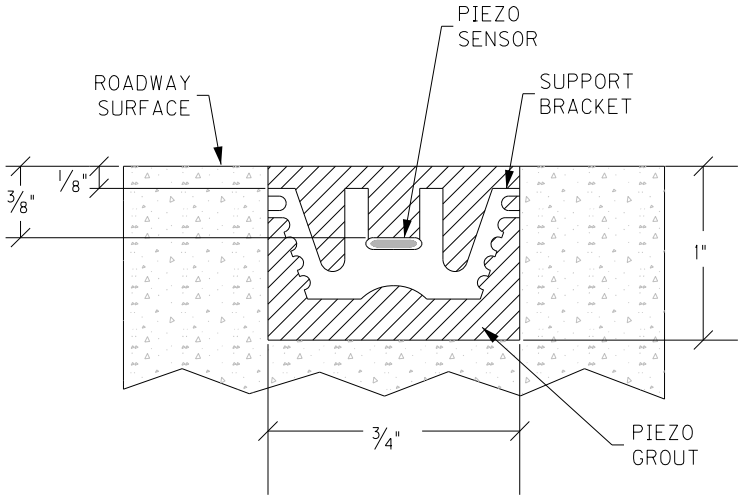
PLAN



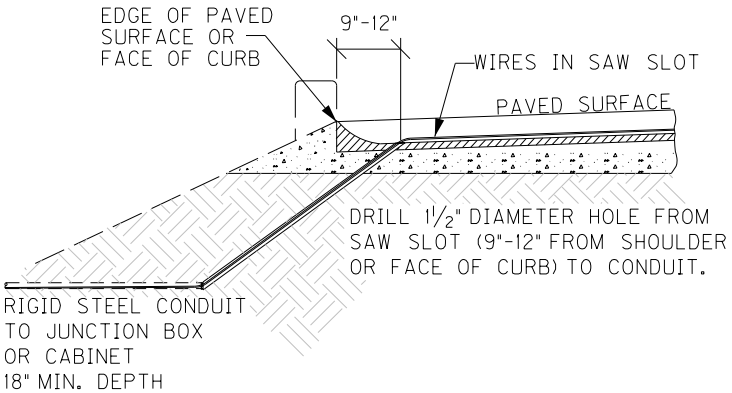
ELEVATION



SECTION B-B



SECTION A-A



SAW SLOT EDGE OF PAVEMENT TRANSITION

PIEZOELECTRIC SENSOR INSTALLATION

NOT TO SCALE

TEAM KENTUCKY TRANSPORTATION CABINET

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)
11-147.00	Laurel	1100 FD04 063 8063901R	

PROJECT DESCRIPTION

Relocation and Major Widening of US 25 Laurel County.

☐ **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	126	EXCEPTION (S) Parcel #	ANTICIPATED DATE OF POSSESSION WITH EXPLANATION
Number of Parcels That Have Been Acquired			
Signed Deed	100		
Condemnation	26		.
Signed ROE	26		All Monies deposited to allow Right of Entry on 26 parcels.

Notes/ Comments (Text is limited. Use additional sheet if necessary.)

3 additional parcels shown on status are Tenant Parcels, all 3 are attached to a Condemnation Parent parcel. P 100T and 125T have been settled and removed from the condemnation action. There is an active demolition contract on the project that is in the last stages and scheduled for completion on July 11th, 2026. Please note that Par 258 has a tenant occupied building. This parcel can't be entered for 60 days or until building is vacated by the tenant and verified vacated by the District property management agent.

LPA RW Project Manager		Right of Way Supervisor	
Printed Name		Printed Name	Digitally signed by Greg Combs
Signature		Signature	Greg Combs
Date		Date	Date: 2026.06.29 15:43:30 -04'00'

Right of Way Director		FHWA	
Printed Name		Printed Name	
Signature	2026.06.30 08:15:58 -04'00'	Signature	
Date		Date	

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

GENERAL UTILITY NOTES

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

2. The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. The contractor is instructed to contact KY 811 for the location of existing underground utilities. Contact shall be made a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY 811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom are to be contacted through their individual Protection Notification Center. It may be necessary for the contractor to contact the County Court.

3. The contractor should be aware that there is UTILITY WORK INCLUDED IN THIS ROAD CONSTRUCTION CONTRACT. The Contractor shall review the GENERAL UTILITY NOTES AND INSTRUCTIONS which may include KYTC Utility Bid Item Descriptions, utility owner supplied specifications, plans, list of utility owner preapproved subcontractors, and other instructions. Utility contractors may be added via addendum if KYTC is instructed to do so by the utility owner. Potential contractors must seek prequalification from the utility owner. Any revisions must be sent from the utility owner to KYTC a minimum of one week prior to bid opening.

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

4. 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.

5. 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

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

DO NOT DISTURB THE FOLLOWING FACILITIES LOCATED WITHIN THE PROJECT

Not Applicable

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR)(2020CCR)**		
Mile Point:	**9 To 10.505**		

THE FOLLOWING FACILITY OWNERS ARE RELOCATING/ADJUSTING THEIR FACILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

Laurel County Water District #2	Water-Laurel	02/23/2026	06/30/2026
Scope: Includes relocating 635 LF – 10-in PVC Water Line, 2150 LF – 6-in PVC Water Line, 735 LF 6-in DI Water Line, and various other appurtenances			
Jackson Energy Cooperative Corporation	Electric-Laurel	01/12/2026	04/23/26
Scope: Includes relocating and/or adjusting 25 utility poles, approximately 13,648 LF of Primary & Secondary Conductors, & Triplex Secondary/Services Wires, 7 transformers, along with various appurtenances. While Jackson Energy is complete, the existing poles will be removed by Windstream upon their completion.			

Utility relocation activities are underway. The only companies completed prior to construction are Laurel County Water District #2 and Jackson Energy Cooperation. Jackson Energy existing poles along KY 229 will remain until after all other companies have shifted from the existing to the new poles.

The highway contractor will be responsible for all utility coordination after the project letting. The highway contractor is expected to hold monthly meetings (more if necessary) to keep the work progressing and avoid delays. The contractor will be required to coordinate the utility reconstruction work of the overhead and underground utility companies to ensure that their work is not impeded by the relocation of the water and sewer utility included in the highway contract.

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

The proposed strategy for relocating the utilities are as follows:

The priority corridor of focus of the first phase of the utility relocation includes (1) the new connector from Existing US 25 to Existing KY 229, (2) KY-229 (Relocated US 25) from Commercial Drive to US 25 tie north at Dyche Memorial Park, and (3) Existing US 25 from the beginning of the project to the new connector.

Once the utilities are relocated along the priority corridor, the highway contractor will coordinate the relocation of utilities along US-25 from the new connector to KY 192, Commercial Drive, and any other required utility relocations.

The contractor is to ensure that the relocation work of the utility companies is not impeded by the relocation of the water and sewer utility included in the highway contract.

Refer to the attached Overhead Utility Relocation Phasing Plan. The list of utilities in each phase represents their order on the poles along each section.

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

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

Utility Company	Facility Type	Start Date	Completion Date
Delta Natural Gas Company, Inc.	Natural Gas-Laurel	August 2026	120 days
Scope: Includes relocating 5,101 LF 2" Plastic Pipe PE-2406, 8,415 LF 4" Plastic Pipe PE-2406, 892 LF 3/4" Plastic Pipe PE-2406, 135 LF 1" Plastic Pipe PE-2406, 111 LF 1" Coated Steel Pipe, 3,352 LF 6" Coated Steel, and various appurtenances.			
Ledcor - LTS Kentucky Managed Technical Services LLC Kentucky Communications Network Authority - Communication (KY Wired)	Electric-Laurel	July 2026	Undetermined
Scope: Includes installing and/or adjusting: (Section 1) 2,235 LF – ¼" EHS strand, 2,385 LF – lash new 288 ct fiber cable (includes slack), 2,537 LF – 288 ct fiber cable (entire build), 2,295 LF – ¼" EHS galvanized strand and other appurtenances. (Section 2) 3,276 LF – ¼" EHS strand, 3,576 LF - lash new 288 and 24 ct fiber cable,1,974 LF – 288 ct fiber cable (entire build), 1,906 LF – 24 ct fiber cable (entire build), 3,456 LF – ¼" EHS galvanized strand (includes estimated down guy lengths), and other appurtenances.			

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

Kentucky Utilities	Communication-Laurel	September 2025	Undetermined
Scope: Relocating 3EA - 55' DI pole, 1EA - 60' DI pole, 3EA – 40' wood pole, 3EA – 45' wood pole, 43EA - 50' wood pole, 60EA - 55' wood pole, 9EA - 60' wood pole, 3EA – 40' wood pole, and appurtenances.			
LAUREL COUNTY BOARD OF EDUCATION	Electric-Laurel	June 2026	Undetermined
Scope: Relocate approximately 3,500 LF of Strand and Cable along US 25. The school system also has fiber along Commercial Drive and on the Jackson Energy Poles on KY 229.			
	Communication-Laurel	Undetermined	Undetermined
Windstream Holdings, II, LLC			
Scope: Includes relocating and/or adjusting 29 Guy wires, 115 poles, 20498.34 LF of lashed copper cable, 25345.6 linear feet of lashed fiber optic cable, and Appurtenance.			
Charter Communications	Communication-Laurel	June 2026	Undetermined
Scope: Relocating several thousand LF of Coax cable and fiber on approximately 51 poles and other appurtenances			
KDL- (division of Windstream Communications, LLC)	Communication-Laurel	Undetermined	Undetermined
Scope: Relocating 8013 LF of Strand and Fiber Cable, 900 LF of Overlash Fiber to Existing Strand, on approximately 51 poles and other appurtenances			

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

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

London Utility Commission	Water-Laurel	Undetermined	Undetermined
Refer to the utility relocation plans included in the letting. The scope includes the relocation of water and sewer lines throughout the project and a new sewer pump station.			

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

No Rail Involvement

UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

AREA FACILITY OWNER CONTACT LIST

1. Charter Communications - CATV
   Adam Hacker - Phone: (606) 309-7084 Email: adam.hacker@charter.com
   Phillip Akers- Phillip.akers@charter.com (606) 416-9192

2. Delta Natural Gas Company, Inc. - Natural Gas
   Brent Means - Phone: (859) 744-6171 Email: bmeans@DeltaGas.com

3. Jackson Energy Cooperative Corporation - Electric
   Joe Garland - Phone: (606) 364-9205 Email: joegarland@jacksonenergy.com

4. Kentucky Utilities - Electric
   Dusty Phelps - Phone: (606) 877-2836 Email: dusty.phelps@lge-ku.com

5. LAUREL COUNTY BOARD OF EDUCATION - Communication
   Danny Bishop - Phone: (606) 862-4600 Email: danny.bishop@laurel.kyschools.us

6. Laurel County Water District #2 - Water
   Aaron Bargo - Phone: (606) 521-1285 Email: abargo@laurelwater.com
   Ken Fisher- Kfisher@laurelwater.com

7. Ledcor - LTS Kentucky Managed Technical Services LLC - Communication
   Cory Speary - Phone: (512) 275-3584 Email: Cory.Speary@Ledcor.com
   Kentucky Communications Network Authority (KY Wired) - Communication
   Erick Johnson - Phone: (502) 330-0679 Email: erick.johnson@ky.gov

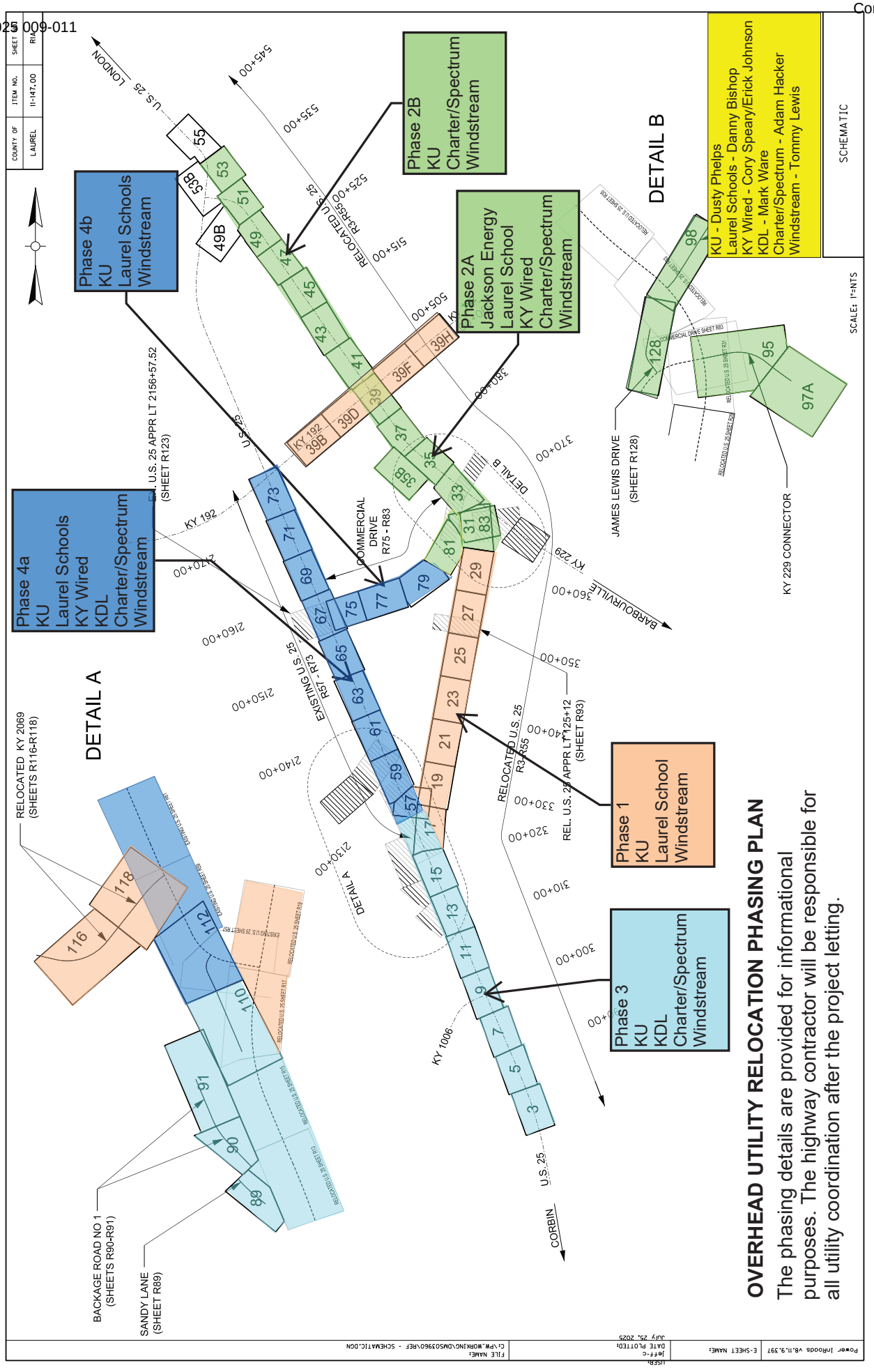
UTILITIES AND RAIL CERTIFICATION NOTE

Project:	**11-147.00**	**Laurel County**	**US 25**
Funding Source:	**FD04 063 8063902U**		
Description:	**REDUCE CONGESTION ON US-25 FROM KY-1006 TO KY-2069; IMPROVE CONNECTIVITY FROM US-25 NEAR KY-2069 TO KY-229; IMPROVE KY-229 FROM THE NEW CONNECTOR NORTH TO KY-192; AND IMPROVE ACCESS TO THE SCHOOL FROM KY-192 BYPASS. (06CCR)(10CCR)(12CCR)(14CCR) (2020CCR)**		
Mile Point:	**9 To 10.505**		

8. London Utility Commission - Water
   Zach Creech - Phone: (606) 864-2103 Email: zcreech@londonutilitycommission.com
   Alan Robinson- arobinson@eclipseengineers.net (859) 433-9585

9. Windstream Communications, LLC - Telephone
   Tommy Lewis - Phone: (606) 309-2279 Email: Tommy.Lewis@windstream.com

10. KDL- (division of Windstream Communications, LLC) - Communication
    Mark Ware - Phone: (606) 329-6195 Email: Mark.Ware@windstream.com


Phase 4a
KU
Laurel Schools
KY Wired
KDL
Charter/Spectrum
Windstream
Phase 4b
KU
Laurel Schools
Windstream
Phase 2B
KU
Charter/Spectrum
Windstream
Phase 2A
Jackson Energy
Laurel School
KY Wired
Charter/Spectrum
Windstream
Phase 1
KU
Laurel School
Windstream
Phase 3
KU
KDL
Charter/Spectrum
Windstream
KU - Dusty Phelps
Laurel Schools - Danny Bishop
KY Wired - Cory Speary/Erick Johnson
KDL - Mark Ware
Charter/Spectrum - Adam Hacker
Windstream - Tommy Lewis
DETAIL A
DETAIL B
SCHEMATIC
SCALE: 1"=NTS
EX. U.S. 25 APPR LT 2156+57.52
(SHEET R123)
RELOCATED U.S. 25
R26-R55
REL. U.S. 25 APPR LT 1125+12
(SHEET R93)
EXISTING U.S. 25
R57 - R73
COMMERCIAL
DRIVE
R75 - R83
RELOCATED KY 2069
(SHEETS R116-R118)
BACKAGE ROAD NO 1
(SHEETS R90-R91)
SANDY LANE
(SHEET R89)
JAMES LEWIS DRIVE
(SHEET R128)
KY 229 CONNECTOR
KY 192
KY 1006
KY 229
U.S. 25
LONDON
CORBIN
BARBOURVILLE
OVERHEAD UTILITY RELOCATION PHASING PLAN
The phasing details are provided for informational purposes. The highway contractor will be responsible for all utility coordination after the project letting.

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

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

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

PROTECTION OF EXISTING UTILITIES

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

PREQUALIFIED UTILITY CONTRACTORS

Some utility owners may require contractors that perform relocation work on their respective facilities as a part of the road contract be prequalified or preapproved by the utility owner**. Utility contractors may be added via addendum if KYTC is instructed to do so by the utility owner. Potential contractors must seek prequalification from the utility owner. Any revisions must be sent from the utility owner to KYTC a minimum of one week prior to bid opening.** Those utility owners with a prequalification or preapproval requirement are as follows:

> ***Laurel Utility Commission requires the following contractors to be chosen from to do the relocation work on this project, Akins, Weddle, or Cleary***.

The bidding contractor needs to review the above list and choose from the list of approved subcontractors at the end of these general notes as identified above before bidding. When the list of approved subcontractors is provided, only subcontractors shown on the following list(s) will be allowed to work on that utility as a part of this contract. In such instances, the utility subcontractor is not required to be prequalified with the KYTC Division of Construction Procurement.

IF A UTILITY SUPPLIED CONTRACTOR LIST IS NOT PROVIDED

When the above list of approved subcontractors for the utility work is not provided, the utility work can be completed by the prime contractor, or a prime contractor-chosen subcontractor. In such instances, the subcontractor shall be prequalified with the KYTC Division of Construction Procurement in the work type of "Utilities" (I33). Those who would like to become prequalified may contact the Division of Construction Procurement at (502) 564-3500. Please note: it could take up to 30 calendar days for prequalification to be approved. The prequalification does not have to be approved prior to the bid, but must be approved before the subcontract will be approved by KYTC and the work can be performed.

CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

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

SUBMITTALS AND CORRESPONDENCE

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

ENGINEER

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

INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

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

NOTICE TO UTILITY OWNERS OF THE START OF WORK

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

UTILITY SHUTDOWNS

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

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

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

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

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

STATIONS AND DISTANCES

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

RESTORATION

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

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

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

MATERIAL

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

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

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

SECURITY OF SUPPLIED MATERIALS

If any utility materials are to be supplied by the utility owner, it will be the responsibility of the utility contractor to secure all utility owner supplied materials after delivery to the project site. The utility contractor shall coordinate directly with the utility owner and their suppliers for delivery and security of

the supplied materials. Any materials supplied by the utility owner and delivered to the construction site that are subsequently stolen, damaged or vandalized and deemed unusable shall be replaced with like materials at the contractor's expense.

SPECIAL NOTE
General Utility Coordination

The Contractor shall communicate, cooperate, and coordinate with the Department, the utility owners, and potentially affected third parties, as necessary for the utility relocation work. The Contractor shall be responsible for all coordination needed to ensure that the road construction and utility relocation work may concurrently and effectively take place.

This item shall include assignment of a Utility Coordinator for the project to coordinate plans, work and schedules directly with the utility companies and KYTC personnel. The Utility Coordinator shall be a licensed professional engineer with the utility coordination certification from KYTC and have project management experience. This item includes responsibility to ensure the project progresses efficiently and in accordance with the proposed contract documents. The Department may consult the Utility Coordinator on matters of utility work design, construction, cost, and/or schedule. Any changes in the proposed scope, design, construction, cost, and/or schedule for the utility work shall be approved by the Department. This item includes conducting monthly (Weekly or Biweekly) coordination meetings with involved utility companies and as needed on project site visits to manage utility relocation activity, resolve conflicts with the road activity, and minimize impact to the project. The department shall be invited to Utility Coordination meetings.

The Contractor shall invite all the utility owners to the preconstruction meeting. A two weeks' notice shall be sent to all utility owners prior to the pre-construction meeting.

The Contractor shall coordinate with Laurel Water District #2 and Jackson Energy on avoiding impacts to newly relocated facilities. The contractor will also be responsible for coordinating with KU, LUC, Windstream, Delta, Charter, Kentucky Communications, Laurel County BOE and Ledcor that will be relocating during the construction of the project. Prior to construction it is the contractor's responsibility to ensure that facilities will be marked, surveyed, and submitted to the construction Engineer in form of a DGN and PDF. Any damage to the relocated utility facilities constructed prior to letting or constructed as a part of the highway contract will be the responsibility of the contractor to repair in a timely manner. This work is incidental to the bid Item "Utility Coordination"

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

Code	Item Description	Unit
24845EC	Utility Coordination	Lump Sum

Specifications

for:

US 25 Waterline and Sanitary Sewer Relocations

London Utility Commission
801 North Main Street
London, Kentucky 40741

April 2026



Prepared by:

ECLIPSE ENGINEERS, PLLC
113 WEST MT. VERNON STREET
SOMERSET, KENTUCKY 42501
PHONE: 606-451-0959

TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
DIVISION 2 - SITE WORK		
02150	SHORING AND BRACING	1 - 1
02221	ROCK REMOVAL	1 - 1
02222	EXCAVATION	1 - 5
02223	EMBANKMENTS AND BACKFILL	1 - 5
02225	EXCAVATING, BACKFILLING, AND COMPACTING FOR UTIL.	1 - 7
02235	CRUSHED STONE AND DENSE GRADED AGGREGATE (DGA)	1 - 2
02505	CRUSHED STONE PAVING	1 - 2
02510	ASPHALT CONCRETE PAVING	1 - 3
02520	PORTLAND CEMENT CONCRETE PAVING	1 - 2
02610	WATER PIPE AND FITTINGS	1 - 7
02630	ENCASEMENT PIPE	1 - 4
02640	WATER VALVES AND GATES	1 - 8
02642	SEWAGE VALVES AND GATES	1 - 15
02675	DISINFECTION OF POTABLE WATER PIPE	1 - 1
02731	GRAVITY SEWERS	1 - 12
02732	SEWAGE FORCE MAINS	1 - 5
02733	SEWAGE PUMP STATION	1 - 10
02735	MANHOLES	1 - 7
02830	FENCES AND GATES	1 - 5
02930	SEEDING AND SODDING	1 - 3
DIVISION 3 - CONCRETE		
03310	STRUCTURAL CONCRETE	1 - 17
03600	PRECISION GROUTING	1 - 3
DIVISION 16 - ELECTRICAL		
16000	ELECTRICAL WORK	1 - 12

END OF TABLE OF CONTENTS

Division 2 – Site Work

SECTION 02150 - SHORING AND BRACING

PART 1 - GENERAL

1.01 SUMMARY

A. Shore and brace sidewalls in deep excavations with steel sheet, soldier piles or timber lagging as required to protect existing buildings, utilities, roadways, and improvements. Prevent cave-ins, loss of ground, or damage to people and property.

B. Maintain shoring and bracing during construction activities, and remove shoring and bracing if practical when construction and filling is complete.

1.02 SUBMITTALS

Submit for approval shop drawings and information on methods proposed for use.

1.03 QUALITY ASSURANCE

Comply with governing codes and regulations. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Sheet Steel: Heavy-gauge steel sheet suitable for service.

B. Soldier Piles: Steel H-beams in serviceable condition.

C. Timber Lagging: Heavy timber pressure treated with wood preservative.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in proper relation with adjacent construction. Coordinate with work of other sections.

B. Locate shoring and bracing to avoid permanent construction. Anchor and brace to prevent collapse.

END OF SECTION 02150

SECTION 02221 - ROCK REMOVAL

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall excavate rock, if encountered, as required to perform the required work, and shall dispose of the excavated material or stockpile for later use in non-structural areas. Contractor shall furnish acceptable material for backfill in place of the excavated rock.

B. In general, rock in pipe trenches shall be excavated so as to be not less than 6-inches from the pipe (bottom and sides) after pipe has been laid.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Rock Definition: Solid mineral material that cannot be removed by heavy excavating equipment with ripping tools.

PART 3 - EXECUTION

3.01 MEANS OF REMOVAL

A. No blasting will be allowed in this Contract.

B. The Contractor shall be solely responsible for rock removal operations. The Contractor shall not hold the Owner and/or the Engineer liable for any damages resulting from rock removal operations on this project.

3.02 PAYMENT

Rock excavation shall be bid as unclassified and will not be paid for separately.

END OF SECTION 02221

SECTION 02222 - EXCAVATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Structure excavation.

B. Shoring excavations.

1.02 RELATED REQUIREMENTS

A. Section 02221 - Rock Removal.

B. Section 02223 – Embankments and Backfill.

C. Section 02225 - Excavating, Backfilling and Compacting for Utilities.

1.03 PROTECTION

A. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.

B. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.

C. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

D. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

E. Grade excavation top perimeter to prevent surface water run-off into excavation.

F. Contractor shall provide ample means and devices with which to intercept any water entering the excavation area.

1.04 ROCK EXCAVATION

Any rock encountered within foundation excavations for recommended soil bearing elements should be removed to a depth sufficient to provide a minimum 24 inch cushion between the bottom of the footing and the top of rock. The cushion should be constructed of properly compacted KY DOT #610 stone or DGA free of organics and deleterious materials. See Section 02223, Embankments and Backfill.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Subsoil: Excavated material, graded free of lumps larger than 12-inches, rocks larger than 12-inches, and debris.

PART 3 - EXECUTION

3.01 PREPARATION

Identify required lines, levels, contours, and datum.

3.02 EXCAVATION

A. Excavate subsoil required for structure foundations, construction operations, and other work.

B. Contractor is responsible to adequately brace open cuts and protect workmen and equipment from cave-in.

C. Remove lumped subsoil, boulders, and rock up to 1/3 cu. yd., measured by volume.

D. Correct unauthorized excavation at no cost to Owner.

E. Fill over-excavated areas under structure bearing surfaces in accordance with direction by Engineer.

F. Stockpile excavated material in area designated on site.

3.03 EXCAVATION FOR STRUCTURES

A. For structures, excavate to elevations and dimensions indicated, plus ample space for construction operations and inspection of foundations.
   1. Unless otherwise shown on drawings, excavate for foundation bearing a minimum of 24-inches below existing grade. Structure foundations shall bear entirely on rock, or entirely on compacted granular fill. Where structures are not to be supported on rock and rock is encountered, under cut rock 24-inches and backfill with granular material, as directed.

   2. Structure foundations shall be installed immediately after excavation is completed, or if this cannot be done, the last 4 to 6-inches of material should not be removed until preparations for installing the foundation are complete. In no case should foundations be installed in excavations that contain water. Any soft, saturated areas in the bottom of excavations shall be removed or stabilized using granular material.

3. Make no excavation to the full depth indicated when freezing temperatures may be expected unless foundations can be installed after the excavation has been completed. Bottom of excavation shall be protected from frost if foundation installation is delayed.

3.04 REMOVAL OF WATER

A. The Contractor, at his own expense, shall provide adequate facilities for promptly and continuously removing water from all excavation.

B. To ensure proper conditions at all times during construction, the Contractor shall provide and maintain ample means and devices (including spare units kept ready for immediate use in case of breakdowns) with which to remove promptly and dispose properly of all water entering trenches and other excavations. Such excavation shall be kept dry until the structures, pipes, and appurtenances to be built therein have been completed to such extent that they will not be floated or otherwise damaged.

C. All water pumped or drained from the Work shall be disposed of in a suitable manner without undue interference with other work, damage to pavements, other surfaces, or property. Suitable temporary pipes, flumes, or channels shall be provided for water that may flow along or across the site of the Work.

D. If necessary, the Contractor shall dewater the excavations by means of an efficient drainage wellpoint system that will drain the soil and prevent saturated soil from flowing into the excavation. The wellpoints shall be designed especially for this type of service. The pumping unit shall be designed for use with the wellpoints, and shall be capable of maintaining a high vacuum and of handling large volumes of air and water at the same time.

E. The installation of the wellpoints and pump shall be done under the supervision of a competent representative of the manufacturer. The Contractor shall do all special work such as surrounding the wellpoints with sand or gravel or other work which is necessary for the wellpoint system to operate for the successful dewatering of the excavation.

3.05 UNAUTHORIZED EXCAVATION

If the bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void shall be backfilled at the Contractor's expense with thoroughly compacted KY DOT #610 stone or DGA free of organics and deleterious materials in accordance with Section 02223, Embankment and Backfill, or with Class A concrete, if the excavation was for a structure.

3.06 ELIMINATION OF UNSUITABLE MATERIAL

A. If material unsuitable for foundation (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the Drawings and/or Specifications, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted, KY DOT #610 stone or DGA free of organics and deleterious materials or Controlled Low Strength Material.

B. No excavated materials shall be removed from the site of the work or disposed of by the Contractor except as directed or permitted.

C. Surplus excavated materials suitable for backfill shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill; shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions. All work shall be as directed or permitted and without additional compensation.

D. Surplus excavated materials not needed as specified above shall be hauled away and dumped by the Contractor, at his expense, at appropriate on-site locations as designated by the Owner, and in accordance with arrangements made by the Contractor.

3.07 EXCESS MATERIAL

Disposal of excess material shall be the responsibility of the Contractor. The Contractor shall determine the best method and area for disposal and obtain all permits and required permission. On-site areas have been designated by the Owner.

3.08 EXISTING UTILITIES AND OTHER OBSTRUCTIONS

Prior to the commencement of construction on the project, the Contractor shall contact the utility companies whose lines, above and below ground, may be affected during construction and verify the locations of the utilities as shown on the Contract Drawings. The Contractor shall ascertain from said companies if he will be allowed to displace or alter, by necessity, those lines encountered or replace those lines disturbed by accident during construction, or if the companies themselves are only permitted by policy to perform such work. If the Contractor is permitted to perform such work, he shall leave the lines in as good condition as were originally encountered and complete the Work as quickly as possible. All such lines or underground structures damaged or molested in the construction shall be replaced at the Contractor's expense, unless in the opinion of the Engineer, such damage was caused through no fault of the Contractor.

3.09 FIELD QUALITY CONTROL

Provide for visual inspection of rock surfaces under provisions of Section 01400.

END OF SECTION 02222

SECTION 02223 – EMBANKMENTS AND BACKFILL

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Structure perimeter backfilling to subgrade elevations.

B. Site backfilling.

C. Compaction requirements.

D. Access road subgrade preparation.

1.02 RELATED WORK

A. Section 00700 - Submittals (General Conditions).

B. Section 01400 - Quality Control: Compaction requirements of backfill.

C. Section 02222 - Excavation.

D. Section 02225 - Excavation, Backfilling and Compacting for Utilities.

1.03 REFERENCES

A. Commonwealth of Kentucky, Standard Specifications for Road and Bridge Construction.

B. ANSI/ASTM D698 - Moisture-Density Relations of Soils and Soil-Aggregate Mixture Using 5.5 lb Rammer and 12 inch Drop.

C. ANSI/ASTM D1556 - Density of Soil in Place by the Sand-Cone Method.

D. ASTM 2922 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods.

E. ASTM 3017 - Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.04 TESTS

A. Tests and analysis of fill materials will be performed in accordance with ANSI/ASTM D698 and under provisions of Section 01400. Tests shall include but not be limited to gradation analysis and moisture/density relationships.

B. Test will be performed by an approved independent testing laboratory and shall be the responsibility of the Contractor at no additional cost to the Owner.

C. Density test shall be performed in sufficient number to insure the specified densities are being obtained.

D. When ASTM D2922 is used, the calibration curves shall be checked and adjusted if necessary by the procedure described in ASTM D2922, paragraph ADJUSTING CALIBRATION CURVE. ASTM D2922 results in a wet unit weight of soil; and when using this method, ASTM D3017 shall be used to determine moisture content of the soil. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed by the testing laboratory.

1.05 SUBMITTALS

Results of soil moisture and density tests by an approved testing laboratory shall be submitted to the Engineer for review.

1.06 DEFINITIONS

Structural Areas: All locations under concrete foundations, floor slabs, footers, buildings, concrete structures, bridges, etc.

Non-structural Areas: Locations such as landscaped areas, sidewalks, roadways, etc.

PART 2 - PRODUCTS

2.01 SELECT FILL MATERIALS

A. The on-site residual soils are considered suitable for use as compacted fill in non-structural areas. A minimum of 95 percent of the maximum dry density and plus or minus 2 percent of optimum moisture content should be obtained for fill soils supporting non-structural areas. Field density tests should be performed on each lift placed to determine if proper compaction is being achieved. If sufficient suitable material is not available from the excavations, the backfill material in non-structural areas shall be screened gravel, crushed stone or selected borrow as directed. Backfill material in structural areas shall be KY DOT #610, DGA, or Controlled Low Strength Material.

B. Frozen material shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed or shall be otherwise treated as required before new backfill is placed.

C. All material, whether from the excavations or from borrow, shall be of such nature

that after it has been placed and properly compacted, it will make a dense, suitable fill. It shall not contain vegetation, masses of roots, individual roots more than 18-inches long or more than 1/2-inch in diameter, stones over 6-inches in diameter, or porous matter.

2.02 COMPACTED FILL

A. Soil used for compacted fill in non-structural areas should be inorganic clayey soils free of deleterious debris or rocks whose largest dimension is no larger than 3-inches. The soil should have a liquid limit (LL) of less than 50, a plasticity index (PI) of less than 30, and a maximum dry density according to the standard Proctor compaction test of at least 100 pcf. The fill should be compacted to at least 95 percent of the SPMDD. The top foot of structural fill shall be compacted to 100 percent of the SPMDD.

B. The moisture content of the compacted fill material shall be within 2% of the optimum moisture content as determined by ASTMD-698.

2.03 STRUCTURAL BACKFILL

A. An underdrain system shall be provided for the soil bearing structures. The underdrain should be constructed of 12-inches of #57 crushed stone and designed in a manner that would promote positive drainage away from the foundation elements. Final site grading should be accomplished in such a manner as to divert surface runoff and roof drains away from all foundation elements.

B. All structures, unless otherwise noted on the Drawings, shall be supported entirely by bedrock or well compacted crushed stone consisting of Kentucky No. 610 size aggregate, DGA, or Controlled Low Strength Material. Structures that have pressure relief valves shall have a 12-inch blanket of #57 stone to allow for proper drainage around the PRV's. Any building supported by stone should have a minimum of 12-inches of compacted crushed stone beneath the bottom of the slab (i.e. foundation elements). Structures should not be supported on a combination of crushed stone and bedrock.

C. Crushed stone used as a bearing medium should be placed in uniform, loose lifts not exceeding 8-inches in thickness. It is recommended that each lift be compacted by a minimum of five (5) passes of a smooth drum vibratory roller having a total static weight of not less than 20,000 pounds. The diameter of the drum should be between 5.0 and 5.5 feet and 6.0 and 6.5 feet wide.

D. Walls below final grade should be backfilled with a minimum 12-inch thick layer of free draining material up to two feet below final grade. The two feet above this free draining material should be backfilled with an impervious material that would retard surface water infiltration. The free draining material should extend down to a rock blanket beneath the bottom slab. Areas within five (5) feet horizontally from vertical walls, the Contractor shall use a hand compactor.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify foundation perimeter drainage installation has been inspected.

B. Verify areas to be backfilled are free of debris, snow, ice, or water, and ground surfaces are not frozen.

3.02 PREPARATION

A. When necessary, compact subgrade surfaces to density requirements for the backfill material and prepare subgrade or previous layer of compacted fill prior to placement of additional fill by scarifying or disking.

B. Cut out soft areas of subgrade not readily capable of in-situ compaction. Backfill with subsoil and compact to density equal to requirements for subsequent backfill material.

3.03 BACKFILLING - GENERAL

A. Backfill areas to contours and elevations. Use unfrozen materials. The Contractor shall keep the foundation and subgrade free from water or unacceptable materials after the fill operations have started.

B. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

C. Place and compact fill materials in continuous layers not exceeding 8-inches loose depth. Field density tests shall be preformed on each lift.

D. Employ a placement method so not to disturb or damage foundation drainage.

E. Maintain optimum moisture content of backfill material to attain required compaction density as specified. Material deposited on the fill that is too wet shall be removed or spread and permitted to dry, assisted by disking or blading, if necessary, until the moisture content is reduced to the specified limits.

F. All crushed stone fill and crushed stone backfill under structures and pavements adjacent to structures shall be DGA or #610 crushed stone per Kentucky Highway Department Standard Specifications for Road and Bridge Construction, unless indicated otherwise. Fill and backfill materials shall be placed in layers not exceeding eight (8) inches in thickness and compacted to 95 percent of maximum dry density.

G. Backfill shall not be placed against or on structures until they have attained sufficient

strength to support all loads to which subjected without distortion, cracking, or damage. Deposit soil evenly around the structure.

H. Slope grade away from structures minimum 2-inches in 10-feet, unless noted otherwise.

I. Make changes in grade gradual. Blend slopes into level areas.

J. Remove surplus excavation materials to designated areas.

3.04 TOLERANCES

Top Surface of Backfilling: Plus or minus 1-inch.

3.05 FIELD QUALITY CONTROL

A. Compaction testing will be performed in accordance with ASTM D1556 or ASTM D2922 and under provisions of Sections 01400.

B. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

END OF SECTION 02223

SECTION 02225 - EXCAVATING, BACKFILLING, AND COMPACTING FOR UTILITIES

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall make excavations in such widths and depths as will give suitable room for below grade vaults, pump stations, etc., laying pipe to the lines, grades and elevations, furnish, place and compact all backfill materials specified herein or denoted on the Drawings. The materials, equipment, labor, etc., required herein are to be considered as part of the requirements and costs for installing the various pipes, structures and other items they are incidental to.

1.02 RELATED WORK

A. Section 02221 - Rock Removal.

B. Section 02610 - Water Pipe and Fittings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Crushed stone material shall conform with the requirements of the applicable sections of the Kentucky Bureau of Highways Standard Specifications and shall consist of clean, hard, and durable particles or fragments, free from dirt, vegetation or objectionable materials.

B. Two classes of crushed stone material are used in this Section. The type of material in each class is as follows:
   1. Class I - No. 9 Aggregate.
   2. Class II - Dense Graded Aggregate (DGA).

PART 3 - EXECUTION

3.01 EXCAVATION OF TRENCHES

A. Unless otherwise directed by the Engineer, trenches are to be excavated in open cuts.
   1. Where pipe is to be laid in gravel bedding or concrete cradle, the trench may be excavated by machinery to, or just below, the designated subgrade, provided that the material remaining at the bottom of the trench is no more than slightly disturbed.
   2. Where pipe is to be laid directly on the trench bottom, the lower part of trenches

in earth shall not be excavated to subgrade by machinery. However, just before the pipe is to be placed, the last of the material to be excavated shall be removed by means of hand tools to form a flat or shaped bottom, true to grade, so that the pipe will have a uniform and continuous bearing and support on firm and undisturbed material between joints except for limited areas where the use of pipe slings may have disturbed the bottom.

B. Trenches shall be sufficient width to provide working space on each side of the pipe and to permit proper backfilling around the pipe.
   1. The Contractor shall remove only as much of any existing pavement as is necessary for the prosecution of the Work. The pavement shall be cut with pneumatic tools, without extra compensation to the Contractor, to prevent damage to the remaining road surface. Where pavement is removed in large pieces, it shall be disposed of before proceeding with the excavation.

C. All excavated materials shall be placed a safe distance back form the edge of the trench.

D. Unless specifically directed otherwise by the Engineer, not more than 500 feet of trench shall be opened ahead of the pipe laying work of any one crew, and not more than 500 feet of open ditch shall be left behind the pipe laying work of any one crew. Watchmen or barricades, lanterns and other such signs and signals as may be necessary to warn the public of the dangers in connection with open trenches, excavations and other obstructions, shall be provided by and at the expense of the Contractor.

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

F. Trench excavation shall include the removal of earth, rock, or other materials encountered in the excavating to the depth and extent shown or indicated on the Drawings.

3.02 WATER PIPE BEDDING

A. Piping for water mains shall be supported as follows:
   1. The trench bottom for water main piping shall be stable, continuous, relatively smooth and free of frozen material, clodded dirt, foreign material and rock or granular material larger than 1/2 inch in diameter and shall be prepared with a minimum of 6 inches of crushed stone per the Drawings. The foundation for water main piping shall be prepared so that the entire load of the backfill on top

of the pipe will be carried uniformly on the barrel of the pipe. Any uneven areas in the trench bottom shall be shaved-off or filled-in with Class I granular bedding. When the trench is made through rock, the bottom shall be lowered to provide 6-inches of clearance around the pipe. Class I granular bedding or earth material free of rocks shall be used to bring the trench bottom to grade.

B. After each pipe has been brought to grade, aligned, and placed in final position, crushed stone material for water main piping shall be deposited and densified under the pipe haunches and on each side of the pipe up to the spring line of the pipe to prevent lateral displacement and hold the pipe in proper position during subsequent pipe jointing, bedding, and backfilling operations.

C. In wet, yielding and mucky locations where pipe is in danger of sinking below grade or floating out of grade or line, or where backfill materials are of such a fluid nature that such movements of pipe might take place during the placing of the backfill, the pipe must be weighted or secured permanently in place by such means as will prove effective.

D. Where an unstable (i.e., water, mud, etc.) trench bottom is encountered, stabilization of the trench bottom is required. This is to be accomplished by undercutting the trench depth and replacing to grade with a foundation of crushed stone aggregate.

E. The depth of the foundation is dependent upon the severity of the trench bottom. The size of stone aggregate used in the foundation will be determined by the condition of the unstable material. Once the trench bottom has been stabilized, the required Class I bedding material can be placed.

F. It should be noted that no pipe shall be laid on solid or blasted rock.

G. Pipe bedding as required in Paragraphs A, B, and D of this Section is **not** considered a separate pay item.

3.03 WATER PIPE BACKFILLING

A. Initial Backfill:
   1. This backfill is defined as that material which is placed over the pipe from the spring line to a point 12-inches above the top of the pipe. For water main piping, initial backfill material shall be Class I material.
   2. Material used in the initial backfilling is **not** a separate pay item. Payment for the material is included in the unit price per linear foot of water main.

B. Final Backfill:
   1. There are two cases where the method of final backfilling varies. The various cases and their trench situations are as follows:
      a. Case I - Areas not subject to vehicular traffic.
      b. Case II - Paved areas including streets, drives, parking areas, and walks.

2. In all cases, walking or working on the completed pipelines, except as may be necessary in backfilling, will not be permitted until the trench has been backfilled to a point 12-inches above the top of the pipe. The method of final backfilling for each of the above cases is as follows:
   a. Case I - The trench shall be backfilled from a point 12-inches above the top of the pipe to a point 8-inches below the surface of the ground with earth material free from large rock (over one-half cubic foot in volume), acceptable to the Engineer. The remainder of the trench shall be backfilled with earth material reasonably free of any rocks.
   b. Case II - The trench shall be backfilled from a point 12-inches above the top of the pipe to a point 12-inches below the existing pavement surface with Class I (No. 9 crushed stone aggregate) material. The backfill shall be mechanically tamped in approximately 6-inch layers to obtain the maximum possible compaction. The remaining backfill shall be Class II (dense graded aggregate) material mechanically tamped to maximum possible compaction. The trench may be left with a slight mound if permitted by the Engineer. Where required by state or local regulations, a bituminous binder coarse detailed on the Drawings and specified in Section 02510 shall be incorporated in the final backfill.
3. Earth and Class I material used in final backfill is not a separate pay item. Payment shall be included in the price of water main.
4. Class II material used in final backfill shall be included in the unit price of the pipe.

C. A sufficient amount of Class II material shall be stockpiled to ensure immediate replacement by the Contractor of any settled areas. No extra payment will be made for the filling in of settled or washed areas by the Contractor.

D. Excavated materials from trenches, in excess of quantity required for trench backfill, shall be disposed of by the Contractor. It shall be the responsibility of the Contractor to obtain location or permits for its disposal, unless specific waste areas have been designated on the Drawings or noted in these Specifications. The cost of disposal of excess excavated materials, as set forth herein, no additional compensation being allowed for hauling or overhaul.

3.04 GRAVITY SEWER AND FORCE MAIN PIPE BEDDING

A. Piping for gravity sewers and force mains shall be supported as follows:
   1. All gravity sewer piping shall be laid on a bed of granular material except when a concrete encasement situation occurs. All pipe bedding material shall be Class I (No. 9 crushed stone aggregate) and shall be placed to a depth of 6-inches in an earth trench and 6-inches in a rock trench. Aggregate bedding shall be graded to provide for a uniform and continuous support beneath the pipe at all points.
   2. The trench bottom for force main piping shall be stable, continuous, relatively smooth and free of frozen material, clodded dirt, foreign material and rock or granular material larger than 1/2 inch in diameter. The foundation for force main

piping shall be prepared so that the entire load of the backfill on top of the pipe will be carried uniformly on the barrel of the pipe. Any uneven areas in the trench bottom shall be shaved-off or filled-in with Class I granular bedding. When the trench is made through rock, the bottom shall be lowered to provide 6-inches of clearance around the pipe. Class I granular bedding shall be used to bring the trench bottom to grade.

B. After each pipe has been brought to grade, aligned, and placed in final position, Class I material for gravity sewer piping and earth material for force main piping shall be deposited and densified under the pipe haunches and on each side of the pipe up to the spring line of the pipe to prevent lateral displacement and hold the pipe in proper position during subsequent pipe jointing, bedding, and backfilling operations.

C. In wet, yielding and mucky locations where pipe is in danger of sinking below grade or floating out of grade or line, or where backfill materials are of such a fluid nature that such movements of pipe might take place during the placing of the backfill, the pipe must be weighted or secured permanently in place by such means as will prove effective.

D. Where an unstable (i.e., water, mud, etc.) trench bottom is encountered, stabilization of the trench bottom is required. This is to be accomplished by undercutting the trench depth and replacing to grade with a foundation of crushed stone aggregate.

E. The depth of the foundation is dependent upon the severity of the trench bottom. The size of stone aggregate used in the foundation will be determined by the condition of the unstable material. Once the trench bottom has been stabilized, the required Class I bedding material can be placed.

F. It should be noted that no pipe shall be laid on solid or blasted rock.

G. Pipe bedding as required in Paragraphs A, B, and D of this Section is **not** considered a separate pay item.

3.05 GRAVITY SEWER AND FORCE MAIN BACKFILL

A. Initial Backfill:

1. This backfill is defined as that material which is placed over the pipe from the spring line to a point 12-inches above the top of the pipe. For gravity sewer piping the material shall be Class I (No. 9 crushed stone aggregate) and may be machine placed without compaction. Uneven places in the backfill shall be leveled by hand. For force main piping, initial backfill material shall be earth material free of rocks, acceptable to the Engineer or with Class I material when a condition exists mentioned in Paragraph A, 3. below.
2. Material used, whether earth or Class I, in the initial backfilling is **not** a separate pay item. Payment for the material is included in the unit price per linear foot of gravity sewer or force main.

3. In areas where large quantities of rock are excavated and the available excavated earth in the immediate vicinity is insufficient for placing the required amount of backfill over the top of the pipe as set forth in Paragraph A.1, the Contractor shall either haul in earth or order Class I material for backfilling over the pipe. Neither the hauling and placement of earth nor the ordering and placement of Class I material to fulfill the backfill requirements set forth herein is considered a separate pay item.

B. Final Backfill:
   1. There are two cases where the method of final backfilling varies. The various cases and their trench situations are as follows:
      a. Case I - Areas not subject to vehicular traffic.
      b. Case II - Paved areas including streets, drives, parking areas, and walks.
   2. In all cases, walking or working on the completed pipelines, except as may be necessary in backfilling, will not be permitted until the trench has been backfilled to a point 12-inches above the top of the pipe. The method of final backfilling for each of the above cases is as follows:
      a. Case I - The trench shall be backfilled from a point 12-inches above the top of the pipe to a point 8-inches below the surface of the ground with earth material free from large rock (over one-half cubic foot in volume), acceptable to the Engineer. The remainder of the trench shall be backfilled with earth material reasonably free of any rocks.
      b. Case II - The trench shall be backfilled from a point 12-inches above the top of the pipe to a point 12-inches below the existing pavement surface with Class I (No. 9 crushed stone aggregate) material. The backfill shall be mechanically tamped in approximately 6-inch layers to obtain a compaction of 95 percent density as measured by the modified Procter Test. The remaining backfill shall be Class II (dense graded aggregate) material mechanically tamped to the compaction as required above for Class I material. The trench may be left with a slight mound if permitted by the Engineer. Where required by state or local regulations, a bituminous binder coarse detailed on the Drawings and specified in Section 02510 shall be incorporated in the final backfill.
   3. Earth and Class I material used in final backfill is not a separate pay item. Payment shall be included in the price of gravity sewer and force main.
   4. Class II material used in final backfill shall be included in the unit price for gravity sewer and force main.

C. A sufficient amount of Class II material shall be stockpiled to insure immediate replacement by the Contractor of any settled areas. No extra payment will be made for the filling in of settled or washed areas by the Contractor.

D. Excavated materials from trenches, in excess of quantity required for trench backfill, shall be disposed of by the Contractor. It shall be the responsibility of the Contractor to obtain location or permits for its disposal, unless specific waste areas have been designated on the Drawings or noted in these Specifications. The cost of disposal of

excess excavated materials, as set forth herein, no additional compensation being allowed for hauling or overhaul.

3.06 PLACEMENT OF IDENTIFICATION TAPE

A. The placement of detectable mylar underground marking tape shall be installed over all utility lines. Care shall be taken to insure that the buried marking tape is not broken when installed and shall be Lineguard brand encased aluminum foil, Type III. The identification tape is manufactured by Lineguard, Inc., P.O. Box 426, Wheaton, IL 60187.

B. The identification tape shall bear the printed identification of the utility line below it, such as "Caution - Buried Below". Tape shall be reverse printed; surface printing will not be acceptable. The tape shall be visible in all types and colors of soil and provide maximum color contrast to the soil. The tape shall meet the APWA color code, and shall be 2-inches in width. Colors are: yellow - gas, green - sewer, red - electric, blue - water, orange - telephone, brown - force main.

C. The tape shall be the last equipment installed in the trench so as to be first out. The tape shall be buried 18-inches below top of grade. After trench backfilling, the tape shall be placed in the backfill and allowed to settle into place with the backfill. The tape may be plowed in after final settlement, installed with a tool during the trench backfilling process, unrolled before final restoration or installed in any other way acceptable to the Owner or Engineer.

3.07 COPPER TRACING WIRE

No. 12 solid copper wire shall be laid in top 12 inches of trench over all plastic pipe. The copper tracing wire shall be wrapped around a line marker at least three (3) times and tied one (1) foot above grade.

END OF SECTION 02225

SECTION 02235 - CRUSHED STONE AND DENSE GRADED AGGREGATE (DGA)

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Various sizes, types and quality of crushed stone aggregates are specified in this Section depending on applicability which may be specified in detail in other sections of these Specifications.

B. The Utilities Board may require the use of crushed stone aggregates for purposes other than those specified in this or other Specification sections if such use is advisable.

PART 2 - PRODUCTS

2.01 MATERIALS

Crushed stone aggregate shall meet the applicable requirements for the intended use in accordance with Section 805 of the Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Compacted Crushed Stone Aggregate
1. Crushed stone shall be placed in uniform layers not greater than 6 inches deep and shaped by power equipment to required lines, grades, cross connections, and depths. No minimum compacted density, method of compaction, or compaction equipment is required since a nominal amount of compaction effort with vibration can establish the desired intergranular locking of the aggregate under controlled placement depth. Acceptable compaction can be achieved with pneumatic-tired and tracked equipment and rollers.
2. All compaction operations shall be performed to the satisfaction of the Utilities Board
3. Crushed stone shall be placed in those areas as directed by the Utilities Board.

B. Compacted Dense Graded Aggregate (DGA)
1. Dense graded aggregate shall be plant mixed with water, transported in such a manner as to deliver the mix to the project without loss or segregation, spread, and compacted to produce a density throughout not less than 84 percent of solid volume. Minimum dry density for compacted limestone DGA shall be 139

pounds per cubic foot when S.G. of limestone is 2.65. Construction requirements shall be in accordance with Section 303 of Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction.

2. Density tests shall be required in such number as determined by the Utilities Board.
3. Compacted material which does not meet density requirements shall be removed. The Utilities Board shall determine if removed material can be remixed and used again for fill.

END OF SECTION 02235

SECTION 02505 - CRUSHED STONE PAVING

PART 1 - GENERAL

1.01 WORK INCLUDED

Crushed stone paving course, compacted.

1.02 REFERENCES

ASTM C33 - Aggregate for Concrete.

1.03 TESTS

Gradation of stone materials will be performed in accordance with ASTM C33.

PART 2 - PRODUCTS

2.01 MATERIALS

Crushed stone shall conform to ASTM C33, Type No. 57, Type No. 2, and No. 610.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify compacted subgrade.

B. Verify gradients and elevations of base are correct.

C. Beginning of installation means acceptance of existing conditions.

3.02 PLACING STONE PAVING

A. Spread stone material over prepared base to a total compacted thickness of 12 inches.

B. Place stone in 6-inch layers and compact.

C. Level surfaces to elevations and gradients indicated.

D. Add small quantities of sand to stone mix as appropriate to assist compaction.

E. Adequately compact placed stone materials.

F. Add water to assist compaction. With an excess water condition, rework topping and

aerate to reduce moisture content.

END OF SECTION 02505

SECTION 02510 - ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide asphalt concrete paving for following applications and prepared subbase and compacted base.
   1. Roads.
   2. Parking areas.
   3. Driveways.
   4. Walkways.
   5. Curbs.

B. Provide striping for parking, roadway, and handicapped markings.

1.02 SUBMITTALS

Submit for approval product data, test reports.

1.03 QUALITY ASSURANCE

Comply with governing codes and regulations. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Prime coat: Cut-back asphalt.

B. Tack coat: Emulsified asphalt.

C. Asphalt cement: AASHTO M226 and as required by local authorities.

D. Aggregate: Crushed stone or crushed gravel.

E. Traffic paint: Quick-drying chlorinated-rubber alkyd type, color as approved.

F. Wheelstops: Precast concrete of uniform color and texture with steel stakes.

PART 3 - EXECUTION

3.01 NEW PAVEMENT INSTALLATION

A. Asphalt/aggregate Mixture: Comply with local DPW Standard Specifications for Highways and Bridges. Class as required by loading and use.

B. Remove loose material from compacted subbase. Proof roll and check for areas requiring additional compaction. Report unsatisfactory conditions in writing. Beginning of work means acceptance of subbase.

C. Apply tack coat to previous laid work and adjacent in-place concrete surfaces.

D. Place asphalt concrete at minimum temperature of 225 degrees F in strips not less than 10' wide overlapping previous strips. Complete entire base course before beginning surface course.

E. Construct curbs to dimensions indicated or if not indicated to standard shapes. Provide tack coat between curb and pavement.

F. Begin rolling when pavement can withstand weight of roller. Roll while still hot to obtain maximum density and to eliminate roller marks.

G. Provide 4" lane and striping paint in uniform, straight lines. Provide wheelstops where indicated and securely dowel into pavement. Protect work from traffic and damage.

H. Test in-place asphalt work for thickness and smoothness. Remove and replace defective work and patch to eliminate evidence of patching. Provide the following minimum thickness and smoothness unless otherwise greater thickness is required on the Drawings:
   1. Subbase course: 4-inch No. 2 stone and 4-inch DGA.
   2. Base course: 2-1/2-inch.
   3. Surface course: 1-1/2-inch plus or minus 1/4-inch at drives and parking; 1-inch plus or minus 1/4-inch at walks.
   4. Surface course smoothness: Plus or minus 1/8-inch in 10 feet. No ponding of water is acceptable.

3.02 REPLACEMENT PAVEMENT FOR UTILITIES

A. Sections of pavement shall be replaced as required to install the pipelines. Disturbed pavement shall be reconstructed to original lines and grades with bituminous binder as detailed on the Drawings and in such manner as to leave all such surfaces in fully as good or better condition than that which existed prior to these operations.

B. Prior to trenching, the pavement shall be scored or cut to straight edges along each side of the proposed trench to avoid unnecessary damage to the remainder of the paving. Edges of the existing pavement shall be recut and trimmed as necessary to square, straight edges after the pipe has been installed and prior to placement of the binder course or concrete.

C. Backfilling of trenches shall be in accordance with the applicable portions of Section 02225.

D. Bituminous concrete binder shall be one course construction in accordance with applicable provisions of the Kentucky Department of Highways Standard Specifications, Section 402.
   1. Placement and compaction of binder courses shall be in accordance with Section 402 of the Kentucky Department of Highways Standard Specifications. Minimum thickness after compaction shall be 2-inches for driveways and 5 ½ inches for roads.

E. Pavement restoration shall be in accordance with the above unless shown otherwise on the plans.

END OF SECTION 02510

SECTION 02520 - PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide Portland cement concrete paving at following locations and prepared subbase and compacted base.
   1. Driveways and vehicular entrances.
   2. Walkways.
   3. Curbs.

1.02 SUBMITTALS

Submit for approval product data, mix design, mock-ups, test reports.

1.03 QUALITY ASSURANCE

Comply with governing codes and regulations. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Concrete mix design: Specific mixes as required for sidewalks, curbs, and vehicular ways. Submit mix proposed for use for approval.

B. Exposed aggregate paving:
   1. Aggregate to match approved sample.
   2. Retarder.

C. Reinforcing: 6 x 6, 1.9 x 1.9 welded flat wire mesh and ASTM A36 deformed steel bars.

D. Joints: Preformed joint fillers/sealers.

E. Finish:
   1. Paving: Fine bristled stiff broom.
   2. Exposed aggregate finish: Match approved sample.
   3. Imprinting: Tools and hardeners by Bomanite Corp.
   4. Curbs: Steel form finish.

F. Thickness (Unless shown otherwise on the drawings):
   1. Driveways and vehicular entrances - 6 inches.
   2. Walkways - 4 inches.
   3. Curbs - 6 inches.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Proof roll subbase and check for unstable areas. Report unsatisfactory conditions in writing. Beginning paving work means acceptance of subbase.

B. Comply with concrete section for concrete mix, testing placement, joints, tolerances, curing, repairs and protection.

END OF SECTION 02520

SECTION 02610 – WATER PIPE AND FITTINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all labor, material, and equipment necessary to install water main piping together with all appurtenances as shown and detailed on the Drawings and specified herein.

1.02 RELATED WORK

A. Section 02222 - Excavation.

B. Section 02223 – Embankments.

C. Section 02225 - Excavating, Backfilling and Compacting for Utilities.

D. Section 02640 - Water Valves and Gates.

E. Section 02675 - Disinfection of Potable Water Pipe.

1.03 REFERENCES

A. AWWA C104.

AWWA C110.

AWWA C111.

AWWA C115.

AWWA C150.

AWWA C151.

AWWA C153.

ASTM C443.

ASTM C478.

ASTM D1785.

ASTM D2467.

ASTM D2564.

PART 2 - PRODUCTS

2.01 DUCTILE IRON PIPE (DIP) AND FITTINGS

A. Ductile iron pipe (DIP) shall conform to ANSI/AWWA C150/A21.50, ANSI/AWWA C151/A21.51 Standard. The pipe shall conform to pressure class 350 minimum unless noted otherwise. All pipe, fittings and joints must be capable of accommodating pressure up to 350 psi. The ductile iron pipe shall be as manufactured by Clow Corp., U.S. Pipe & Foundry Co., American Cast Iron Pipe Co., or equal.

B. Fittings shall be restrained mechanical joint or push-on joint ductile iron per the Drawings in accordance with AWWA C153 and have a body thickness and radii of curvature conforming to ANSI A21.10 or ANSI A21.53 for compact fittings. Fittings and joints shall be supplied with all accessories.

1. Restrained mechanical joint fittings shall have joints in accordance with ANSI/AWWA C111/A21.11. Fitting restraint shall be by set screw retainer rings Ford UFR 1400-DA-8-I, or equal.

2. Push-on type joints shall be single rubber gasket, with cast gasket socket and recessed bell with a tapered annular opening and flared socket. Plain spigot ends shall be suitably beveled to permit easy entry into the bell, centering and compressing the gasket. Push-on joints shall be equal to the “Fastite” joint as manufactured by American Cast Iron Pipe Company, or "Tyton Joint" as manufactured by US Pipe & Foundry Company, or approved equal. Push-on fittings shall have a restraint system as per paragraph 2.01.I of this section.

C. Ductile iron flanged joint pipe shall conform to ANSI/AWWA C115/A 21.15 Standard and have a thickness Class of 53. The pipe shall have a rated working pressure of 250 psi with Class 125 flanges. Gaskets shall be ring gaskets with a thickness of 1/8 inch. Flange bolts shall conform to ANSI B 16.1.

D. Flanged fittings shall meet all requirements of ANSI/AWWA C110/A21.10 (or A21.53 for compact fittings) and have Class 125 flanges. Fittings shall accommodate a working pressure up to 250 psi and be supplied with all accessories.

E. All pipe and fittings shall be asphaltic coated outside and shall receive a standard cement lining with asphaltic seal coat on the inside in accordance with ANSI/AWWA C104/A21.4.

F. Cement mortar lining and seal coating for pipe and fittings, where applicable shall be in accordance with ANSI/AWWA C104/A21.4. Asphaltic outside coating shall be in accordance with ANSI/AWWA C151/A21.51 for pipe and ANSI/AWWA

C110/A21.10 for fittings.

G. All ductile fittings shall be rated at 250 psi water working pressure plus water hammer. Ductile iron fittings shall be ductile cast-iron grade 70-50-05 per ANSI/AWWA C110/A21.10.

H. No separate pay item has been established for fittings and no determination of the number of fittings required on the job has been made. The Contractor, during the bidding phase, shall determine the number of fittings required on the job and include the cost of the fittings and installation in the unit price for pipe.

I. Restrained joint pipe and push-on fittings shall be a boltless system equal to “Fast-Grip” restraining gaskets or “Flex-Ring” joint as manufactured by American Cast Iron Pipe Company, or "Field-Lok" restraining gaskets or "TRFLEX Joint" as manufactured by US Pipe & Foundry Company, or equal.

J. Ball and socket restrained joint pipe and fittings shall be a boltless system equal to USIFLEX manufactured by U.S. Pipe and Foundry Company or FLEX-LOK manufactured by American Cast Iron Pipe Company. Pipe shall have a working pressure rating of 250 psi and have a maximum joint deflection of 15 degrees. Nominal laying lengths shall be in the range of 18-feet 6-inches to 20-feet 6-inches.

K. Pipe shall be as manufactured by U.S. Pipe & Foundry Company, American Cast Iron Pipe Company, or equal.

2.02 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

A. Polyvinyl chloride (PVC) pipe for buried water mains smaller than 4-inches in diameter shall be Class 250 (SDR 17) PVC pressure rated pipe with either twin gasket joints or integral bell joints with rubber O-ring seals. All Class 250 pipe shall meet the requirement of SDR 17.

B. All PVC pipe shall conform to the latest revisions of ASTM D-1784 (PVC Compounds), ASTM D-2241 (PVC Plastic Pipe, SDR), and ASTM D-2672 (Bell-end PVC Pipe). PVC pipe shall have a minimum cell classification of 12454B or 12454C as defined in ASTM D-1784. Rubber gasketed joints shall conform to ASTM D-3139. The gaskets for the PVC pipe joint shall conform to ASTM F-477 and D-1869.

C. Rubber gasket joints shall provide adequate expansion to allow for a 50 degree change in temperature on one length of pipe. Lubrication for rubber connected couplings shall be water soluble, non-toxic, be non-objectionable in taste and odor and have no deteriorating affect on the PVC or rubber gaskets and shall be as supplied by the pipe manufacturer.

D. All pipe and couplings shall bear identification markings that will remain legible during normal handling, storage and installation, which have been applied in a manner

what will not reduce the strength of the pipe or the coupling or otherwise damage them. Pipe and coupling markings shall include the nominal size and OD base, material code designation, dimension ratio number, ASTM Pressure Class, ASTM designation number for this standard, manufacturer's name or trademark, seal (mark) of the testing agency that verified the suitability of the pipe material for potable-water service. Each marking shall be applied at intervals of not more than 5 feet for the pipe and shall be marked on each coupling.

2.02 High Density Polyethylene (HDPE) and Copper Pipe

A. Underground Tubing with Compression Joints

Small piping underground shall be of standard soft copper tubing for water service pipe, ASTM Specifications B 88-93, Type "K," or PE SDR-9, Class 200-psi, with bronze fittings, stops, and valves having compression connections for flared copper tubing. See drawings for the type of service pipe to be installed. Copper piping 2” and larger shall be Type “L” copper.

PART 3 - EXECUTION

3.01 LAYING DEPTHS

In general, water mains shall be laid with a minimum cover of 36-inches, except as otherwise indicated on the Drawings.

3.02 UTILITY CROSSING CONCRETE ENCASEMENT

A. At locations shown on the Contract Drawings, required by the Specifications, or as directed by the Engineer, concrete encasement shall be used when the clearance between the proposed water pipe and any existing utility pipe is 18-inches or less. Utility pipe includes underground sewer, gas, telephone, and electrical conduit, storm sewers, and any other pipe as determined by the Engineer.

B. There are two cases of utility crossing encasement. Case I is applicable when the proposed water line is **above** the existing utility line. Case II is applicable when the proposed water line is laid **below** the utility line. In either case, the concrete shall extend to at least the spring line of each pipe involved.

C. Concrete shall be 3000 psi and shall be mixed sufficiently wet to permit it to flow between the pipes to form a continuous bridge. In tamping the concrete, care shall be taken not to disturb the grade or line of either pipe or damage the joints.

D. Concrete for this Work is not a separate pay item and will be considered incidental to utility pipe installation.

3.03 PIPE LAYING

A. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the plans. Pipe shall be fitted and matched so that when laid in the Work, it will provide a smooth and uniform invert. Supporting of pipe shall be as set out in Section 02225 and in no case shall the supporting of pipe on blocks be permitted.

B. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to ensure it is clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fittings shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe. Bevel can be made with hand or power tools.

C. The interior of the pipe, as the Work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted so as to exclude earth or other material and precautions taken to prevent floatation of pipe by runoff into trench.

D. Anchorage of Bends:

1. At all tees, plugs, caps and bends of 11 ¼ degrees and over, and at reducers or in fittings where changes in pipe diameter occur, movement shall be prevented by using suitable harness, thrust blocks or ballast. Thrust blocks shall be as shown on the Drawings, with sufficient volumes of concrete being provided; however, care shall be taken to leave weep holes unobstructed and allow for future tightening of all nearby joints. Unless otherwise directed by the Engineer, thrust blocks shall be placed so that pipe and fitting joints will be accessible for repair.

2. Bridles, harness or pipe ballasting shall meet with the approval of the Engineer. Steel rods and clamps shall be stainless steel. No extra pay shall be allowed for work to provide proper anchorage of pipe, fittings or other appurtenances. Such items shall be included in the price bid for the supported item.

E. No backfilling (except for securing pipe in place) over pipe will be allowed until the Engineer has the opportunity to make an inspection of the joints, alignment and grade in the section laid, but such inspection shall not relieve the Contractor of further liability in case of defective joints, misalignment caused by backfilling and other such deficiencies that are noted later.

3.04 JOINTING

All joint surfaces shall be cleaned immediately before jointing the pipe. The bell or

groove shall be lubricated in accordance with the pipe manufacturer's recommendations. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. All pipe shall be provided with home marks to insure proper gasket seating. Details of gasket installation and joint assembly shall follow the direction of the manufacturer's of the joint material and of the pipe. The resulting joints shall be watertight and flexible.

3.05 TESTING OF WATER PIPE

A. The completed work shall comply with the provisions listed herein, or similar requirements which will insure equal or better results. Suitable test plugs, water pump or other equipment and apparatus, and all labor required to properly conduct the tests shall be furnished by the Contractor at no expense to the Owner.

B. Water main piping shall be pressure tested to a minimum of 150 pounds per square inch (psi). At no time shall the test pressure exceed 150 percent of the pipe's rated working pressure. A pipe section shall be accepted if the test pressure does not fall more than 5 psi during the minimum 2-hour test period. The pipe shall be tested for allowable leakage according to AWWA C-600 (latest revision) concurrently with the pressure test.

C. Where practicable, pipelines shall be tested between line valves or plugs in lengths of not more than 6,000 feet. Testing shall proceed from the source of water toward the termination of the line. The line shall be tested upon the completion of the first 6,000 feet. After the completion of two (2) consecutive tests without failure, the Contractor, at his option and with the Engineer's approval, may discontinue testing until the system is complete.

D. All pipe, fittings and other materials found to be defective under test shall be removed and replaced at the Contractor's expense.

E. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves and hydrants. If permanent air vents are not located at high points within the test section, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water.

F. All piping shall be tested for leakage at a pressure no less than that specified for the pressure test. The leakage shall be defined as the quantity of water that must be supplied to the tested section to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. The leakage shall be less than an allowable amount determined by guidelines listed in AWWA Manual of Water Supply Practices “PVC PIPE--DESIGN AND INSTALLATION”, or appropriate guidelines for other pipe materials. For PVC pipe, the following equation applies:

$$L = \frac{N*D*P^{0.5}}{}$$ Where: L = allowable leakage (gallons/hour)

$$\frac{7400}{}$$

N = number of joints in the length of pipelines
D = nominal diameter of pipe (inches)
P = average pressure during the leakage test (psig)

G. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and retesting as the Engineer may require without additional compensation. All visible leaks are to be repaired regardless of the amount of leakage.

H. If in the judgement of the Engineer, it is impracticable to follow the foregoing procedures for any reason, modifications in the procedures shall be made as required and as acceptable to the Engineer, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

3.06 PLACEMENT OF IDENTIFICATION TAPE

The placement of detectable underground mylar marking tape shall be installed over all water mains as specified in Section 02225.

END OF SECTION 02610

SECTION 02630 - ENCASEMENT PIPE

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all labor, material, and equipment necessary to install encasement pipe together with all appurtenances as shown and detailed on the Drawings and specified herein.

1.02 RELATED WORK

A. Section 02222 - Excavation.

B. Section 02225 - Excavating, Backfilling and Compacting for Utilities.

C. Section 02610 - Water Pipe and Fittings.

D. Section 02731 – Gravity Sewers

E. Section 02732 – Sewage Force Mains

1.03 REFERENCES

A. ASTM A139 – Standard Specifications for Electric-Fusion (Arc) Welded Steel Pipe (NPS 4 and over).

PART 2 - PRODUCTS

2.01 STEEL PIPE

A. Steel seamless pipe shall be new material, with a minimum yield of 35,000 psi and a wall thickness as shown below. All joints encasement pipe joints shall be welded.

Nominal Diameter Inches	**Minimum Wall Thickness Inches**	
	Highway Crossing	**Railroad Crossing**
14 & Under	0.250	0.500
16	0.375	0.500
18	0.375	0.500
20 & 22	0.375	0.500
24	0.500	0.500
26	0.500	0.500
28	0.500	0.500
30	0.500	0.500

32	0.500	0.500
34 & 36	0.500	0.500
42	0.625	0.625
48	0.625	0.625

B. Weldings of the steel casing pipe shall be solidly butt-welded with a smooth non-obstructing joint inside and conform to all specifications as required by American Welding Society (AWS). The casing pipe shall be installed without bends. All welders and welding operators shall be qualified as prescribed by AWS requirements.

C. The material shall conform to the chemical and mechanical requirements of the latest revision of ASTM A139 "Electric-Fusion (ARC) - Welded Steel Pipe (NPS 4 and Over)," unless otherwise stated herein.

D. Grade B steel shall be used. The steel shall be new and previously unused.

E. Hydrostatic testing shall not be necessary.

F. The wall thickness at any point shall be within 0.025 inches of the nominal metal thickness specified.

G. A protective coating shall be applied to each length of pipe. Following an SSPC SP-7 "Brush-Off Blast Cleaning" surface preparation, 3 (dry) mils of Tnemec-Primer 10-99 (red), or of an approved equal shall be applied in the manner recommended by the respective paint manufacturer.

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

I. Precaution shall be taken to avoid deforming the pipe and damaging the primer during shipping.

J. Pipe shall be within the following tolerances:

Straightness 1/4 -- 3/8.
Roundness 1 Percent.
Thickness 12 1/2 Percent.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Where shown on the Drawings, the Contractor shall install encasement pipe. Two methods of installation are designated, the open-cut method and the boring method.

1. The open-cut method shall consist of placing the encasement pipe in the excavated trench, then installing the carrier pipe inside the encasement pipe. Excavation, bedding and backfilling shall be in accordance with Section 02225.

2. The boring method consists of pushing or jacking the encasement pipe into the hole as an auger cuts out the material or after the auger has completed the bore. The encasement pipe shall be installed in a manner that will not disrupt traffic.

B. The carrier pipe shall be ductile iron, polyvinyl chloride, or polyethylene pipe as designated on the Drawings. The carrier pipe will not be permitted to rest on bells or couplings.

C. Pipeline Spacers

1. Carrier pipes installed inside encasement pipes shall be centered throughout the length of encasement pipe. Centering shall be accomplished by the installation of polyethylene pipeline spacers attached to the carrier pipe in such manner as to prevent the dislodgement of the spacers as the carrier pipe is pulled or pushed through the encasement pipe. Spacers shall be of such dimensions to provide: full supportive load capacity of the pipe and contents; of such thickness to allow installation and/or removal of the pipe; and to allow no greater than 1/2 inch movement of the carrier pipe within the cover pipe after carrier pipe is installed.

2. Spacers shall be located immediately behind each bell and at a maximum spacing distance as follows:

Carrier Pipe Diameter (inches)	Maximum Spacing (feet)
2 - 2-1/2	4
3 - 8	7
10 - 26	10
28	9
30	8
32	7
34	6
36 - 38	5.5
40 - 44	5
46 - 48	4

The materials and spacing to be used shall be accepted by the Engineer prior to installation. The polyethylene pipeline spacers shall be manufactured by Pipeline Seal and Insulator, Inc. (PSI), Raci Spacers, Inc., or equal. Installation shall be in accordance with manufacture's recommendations.

3.02 SEALING

After installation of the carrier pipe within the encasement pipe, the ends of the casing shall be sealed in the following manner. The space between the casing and the carrier pipe shall be filled with a waterproofing bitumastic compound until a tight seal is obtained. An Ethylene Propylene Diene Monomer (EPDM) elastomeric membrane shall be wrapped around the end of the encasement pipe in three layers and securely bound to the casing and the carrier pipe barrel with stainless steel bands. The EPDM membrane shall be 0.045 inches thick and have a tear resistance of 125 pounds/inches. The membrane shall be manufactured by Carlisle Tire & Rubber Company, Firestone Industrial Products Company, or approved equal. The casing sealant should be constructed to allow drainage of liquid (water).

3.03 DAMAGE

The cost of repairing damage that is caused by the boring operation to the highway or railroad shall be borne by the Contractor.

END OF SECTION 02630

SECTION 02640 - WATER VALVES AND GATES

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all labor, material, and equipment necessary to install valves together with all appurtenances as shown and detailed on the Drawings and specified herein.

1.02 RELATED WORK

A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.

B. Section 02610 - Water Pipe and Fittings.

1.03 SUBMITTALS

A. Complete shop drawings of all valves and appurtenances shall be submitted to the Engineer in accordance with the requirements of Section 01300.

B. The manufacturer shall furnish the Engineer two (2) copies of an affidavit stating that the valve and all materials used in its construction conform to the applicable requirements of the latest revision of the applicable AWWA Standard, and that all tests specified therein have been performed and that all test requirements have been met.

C. The Engineer shall be furnished two (2) copies of affidavit that the "Valve Protection Testing" has been done and that all test requirements have been met.

D. The Engineer shall be furnished with two (2) copies of affidavit that inspection, testing and rejection are in accordance with the latest revision of the applicable AWWA Standard.

PART 2 - PRODUCTS

2.01 GATE VALVES

A. All gate valves shall be of the resilient seat type in accordance with the latest revision of AWWA C509 Standard. The valve body, bonnet and gate castings shall be ductile iron or cast iron. The valve shall have a non-rising stem (NRS), fully bronze mounted with o-ring seals. Valve body and bonnet, inside and out, shall be fully coated with fusion bonded epoxy coating in accordance with AWWA C550 Standard. Valves shall have a rated working pressure of 200 psi.

B. Gate valves for buried service shall be furnished with mechanical joint end connections, unless otherwise shown on the Drawings or specified herein. The end connection shall be suitable to receive ductile iron or PVC pipe.

C. Gate valves for meter pits, pump stations, or other installations as shown on the Drawings shall be furnished with flanged joint and connections, outside screw and yoke and handwheel operator. The gate valve shall have the direction of opening cast on the rim of the handwheel and provided with chain and lock.

D. All gate valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working pressure cast on the body of the valve.

E. Buried service gate valves shall be provided with a 2-inch square operating nut and shall be opened by turning to the left (counterclockwise).

F. Buried service gate valves shall be installed in a vertical position with valve box as detailed on the Drawings. They shall be set vertically and properly adjusted so that the cover will be in the same plane as the finished surface of the ground or street.

G. Valves 4-inch and larger shall be model A-2630 as manufactured by Mueller, or equal. Valves smaller than 4-inch shall be model A-2630-8 (threaded) as manufactured by Mueller, or equal.

2.02 CHECK VALVES

A. General:

Check valves shall be all iron body, bronze mounted, full opening swing type. Valve clapper shall swing completely clear of the waterway when valve is full open, permitting a "full flow" through the valve equal to the nominal pipe diameter. They shall comply with AWWA Standard C-508 latest revision. The valves shall be M & H Valve Company, Anniston, AL, Valve Type 159-Lever Weight, or equal.

B. Rating

Check valves shall be rated at 175 psi water working pressure, 350 psi hydrostatic test for structural soundness (2-inch through 12-inch) and 150 psi water working pressure and 300 psi hydrostatic test (sizes 14-inch through 30-inch). Seat tightness at rated working pressure shall be in accordance with valves shown in AWWA Standard C-500 for gate valves and fully conform to AWWA C508.

C. End Configurations:

Check valves shall be furnished with 125-pound ANSI flanges ends with accessories.

D. Materials:

All cast iron shall conform to ASTM-A-126 Class B. Castings shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Clappers shall be all bronze for sizes through 4-inch and cast iron, neoprene faced for sizes 6-inch and larger. Hinge pins shall be 18-8 stainless steel rotating in bronze plugs. Bolts shall be electro-zinc plated steel with hex heads and hex nuts in accordance with ASTM A-307 and A-563, respectively.

E. Design:

Check valves shall be constructed to permit top entry for complete removal of internal components without removing the valve from the line. Glands shall be o-rings, 2-inch to 12-inch sizes and conventional in 14-inch to 30-inch sizes. Check valves shall be equipped with adjustable outside lever and weight to accomplish faster closing and to minimize slamming effect. All valves 14-inch and larger shall have extended hinge pins for future addition of levers and springs required. Valves shall be suitable for installation in either horizontal or vertical position.

F. Painting:

The inside and outside of all valves, together with the working parts except bronze and machined surfaces, shall be coated in accordance with the latest revision of AWWA C550 Standard.

G. Marking:

Marking shall be in accordance with AWWA C-508 and shall include size, working pressure, and cast arrow to indicate direction of flow, name of manufacturer, and year of manufacture.

2.03 AIR RELEASE AND AIR/VACUUM VALVES

A. The air/vacuum valves shall be APCO Series 140 DAT as manufactured by Valve and Primer Corp., or equal.

B. The air release valves shall be APCO Series 140 C as manufactured by Valve and Primer Corp., or equal.

C. The Combination air/vacuum valves shall be APCO Series 140 C as manufactured by Valve and Primer Corp., or equal.

D. The valves shall be of the type that automatically exhausts large quantities of air during the filling of a system and allows air to re-enter during draining or when a vacuum occurs. The over-all height less back wash accessories shall not exceed 21

inches. Valves shall be constructed of cast iron body and cover, stainless trim and float with Buna-N seat for positive seating.

E. The baffle shall be ductile iron and shall protect float from direct impact of air and water. The seat shall slip fit into the baffle or cover and lock in place without any distortion. The float and baffle assembly shall be shrouded with a water diffuser. The float shall be stainless steel center guided for positive seating and be rated at 1000 psi non-shock service.

F. The discharge orifice shall be fitted with a double-acting throttle device to regulate and restrict air venting.

G. All parts of the valves and the opening mechanisms shall be made of non-corrodible materials.

2.04 TAPPING VALVES AND TAPPING SLEEVES AND CROSSES

A. Tapping Valves

1. Tapping valves for use with tapping sleeve and crosses shall be in accordance with the specifications for gate valves, except that one end shall have a flanged connection and the other end either a hub or mechanical joint connection.
2. Valves shall be rated for 250 psi in sizes 2 inch thru 24-inch.
3. Valves shall open by turning counterclockwise.
4. Inlet flanges of valves shall meet ANSI B16.1, Class 125 standard.

B. Tapping Sleeves and Tapping Crosses

1. Tapping sleeves and tapping crosses shall have heavy cross sections to strengthen the existing water main at the point of installation.
2. Mainline end connections to existing pipeline shall be mechanical joint with large and small gaskets.
3. Mechanical joint tapping sleeves and crosses shall have a maximum working pressure of 250 psi.
4. Outlet end of tapping sleeves and crosses shall have ANSI B16.1, Class 125 flanges.

C. Quality Standard

1. For full body tapping valves, tapping sleeves and tapping crosses shall be model T-2360-16 with Tapping Sleeve H-615 as manufactured by Mueller Company, or equal.
2. Saddles for tapping branch lines smaller than 4-inch shall be Smith Blair Series 313 or Mueller BR 2 B Series.

D. Test and Certification

1. Tests on tapping valves shall be in accordance with these Specifications for gate valves.

E. Protection

1. Tapping Valves
   a. Protection of tapping sleeves and valves shall be in accordance with these Specifications for gate valves.

2. Tapping Sleeves and Crosses

   a. Protection for tapping sleeves and crosses shall be in accordance with these Specifications for ductile iron pipe fittings.

2.05 FIRE HYDRANTS

A. All post-type dry barrel fire hydrants will have compression type vales, operating against pressure. They shall meet all requirements of ANSI/AWWA Specification C502-94.

B. They shall have two 2-1/2 inch hose connection nozzles and one 4-1/2 inch steamer connection nozzle, all with caps and drains, and have national support threads.

C. Main valve opening size shall be 5-1/4 inch, which must remain closed when the above ground breakable safety section of the hydrant barrel is broken off.

D. All hydrants shall have 6 inch mechanical joint bell connection designed for 200 pounds working water pressure, in accordance with ANSI/AWWA C110/A21.10-98. Joint accessories are to be furnished with the hydrant.

E. Finish paint color of the hydrant barrel above ground line shall be red.

F. All hydrants shall have an automatic drain feature providing positive barrel drainage after hydrant use.

G. The lowest outlet level of the hydrant shall be located sufficiently above the indicated ground level to permit a 360° swing of a 15 inch hydrant wrench. One standard hydrant wrench is to be provided. All hydrants shall open by turning counterclockwise. All hydrants shall be installed plumb and at proper bury depth. OWNER may require concrete stabilizing collar (2.5' x 2.5' x 0.5') with rebar around hydrants.

H. QualityStandard

1. All post type fire hydrants shall have the features, and be equal to those of Mueller Super Centerion 250 A-423.

2.04 VALVE BOXES

A. Each buried stop and valve shall be provided with a suitable valve box equivalent to the OWNER'S standard valve box. Boxes shall be of the adjustable, telescoping, heavy-pattern type with the lower part of cast iron and the upper part of steel or cast iron. They shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.

B. The upper or sliding section of the box shall be provided with a flange having sufficient bearing area to prevent undue settling. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and rest on the valve bonnet.

C. The boxes shall be adjustable through at least 6 inches vertically without reduction of the lap between sections to less than 4 inches.

D. The inside diameter of boxes for valves shall be at least 4-1/2 inch, and the lengths shall be as necessary for the depths of the valves or stops with which the boxes are to be used.

E. Covers for valves shall be close fitting and substantially dirt-tight.

F. The top of the cover shall be close flush with the top of the box rim. An arrow and the word OPEN to indicate the direction of turning to open the valve shall be cast in the top of the valve covers.

2.04 MISCELLANEOUS STOPS AND SERVICE COUPLINGS

A. Corporation Stops

1. Corporation stops to be used with threaded pipe where connected into cast iron pipe, shall be brass ground joint type with AWWA CC or CS taper thread inlets. Stops shall be F1000-3-Q, as manufactured by Ford Meter Box Company, Inc., or equal.
2. Corporation stops to be used with copper pipe with compression type connections, where connected into cast iron or asbestos-cement pipe, shall be the same, except with compression type outlet connections.
3. Corporation stops shall be factory tested to 250 psi to be compatible with the pipes in which they are installed.
4. Quick joint couplings for ¾" copper or plastics tubing shall be C44-33Q as manufactured by Ford Meter Box Company, Inc., or equal.

2.05 PRESSURE GAUGES

A. Pressure gauges shall have cast brass cases with bourdon tubes and precision rotary movements of bronze, nickel, or other material suitable to the environment in which

they will be located. Dials shall be 6 inches in diameter with a pressure range of 0 to 100 psi. Provide female quick coupler for connection to corporation stop. Each gauge shall be provided with snuffer.

B. Corporation stops shall be similar to Mueller and shall have iron pipe threads with pack joint connection outlets. Provide male quick coupler for attachment of pressure gauge.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Valves shall be installed as nearly as possible in the positions indicated on the Drawings consistent with conveniences of operating the handwheel or wrench. All valves shall be carefully erected and supported in their respective positions free from all distortion and strain on appurtenances during handling and installation.

B. All material shall be carefully inspected for defects in workmanship and material, all debris and foreign material cleaned out of valve openings and seats, all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness.

C. Valves and other equipment that do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense.

D. Valves shall be installed with stems in the vertical position unless an alternate position has been accepted by the Engineer.

E. Valves shall be set plumb and supported adequately in conformance with the instructions of the manufacturer. Valves mounted on the face of concrete shall be shimmied vertically and grouted in place. Valves in the control piping shall be installed so as to be easily accessible.

F. Where chain wheels are provided for remote operation of valves, two (2) S-shaped hooks shall be provided for each valve to enable the chains to be hooked so as not to interfere with personnel traffic.

G. Valves shall be provided with extension stems where required for convenience of operation. Extension stems shall be provided for valves installed underground and elsewhere so that the operating wrench does not exceed 6 feet in length.

H. A permanent type gasket of uniform thickness shall be provided between flanges of valves and sluice gates and their wall thimble.

I. Wall thimbles shall be accurately set in the concrete walls so that the gates can be

mounted in their respective positions without distortion or strain.

J. Floorstand operators and stem guides shall be set so that the stems shall run smoothly in true alignment. Guides shall be anchored firmly to the walls. Distances from the centerlines of gates to the operating level or base of floorstand shall be checked by the Contractor and adjusted if necessary to suit the actual conditions of installation.

3.02 PAINTING

A. Valves shall be factory primed and fully coated, inside and out, with fusion bonded epoxy in accordance with the latest revision of AWWA C550 Standard.

B. Other painting (if required) is specified in Division 9.

END OF SECTION 02640

SECTION 02642 - SEWAGE VALVES AND GATES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall furnish and install valves, gates, and miscellaneous piping appurtenances, as indicated on the Drawings and as herein specified.

B. The Drawings and Specifications direct attention to certain features of the equipment, but do not purport to cover all the details of their design. The equipment furnished shall be designed and constructed equal to the high quality equipment manufactured by such firms as are mentioned hereinafter, or as permitted by the Engineer. The Contractor shall furnish and install the equipment complete in all details and ready for operation.

C. Valves for use in the following services are specified under their appropriate sections:
1. Chemical piping.
2. Heating and air conditioning.
3. Plumbing.
4. Instrumentation.
5. Electrical.

D. Electrical work and equipment specified herein shall conform to the requirements of the applicable electrical sections.

E. Enclosures shall be of a suitable type for the atmospheres in which they are installed.

F. Sizes and capacities not specified herein are indicated on the Drawings.

1.02 RELATED WORK

A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.

B. Section 02732 - Sewage Force Mains.

1.03 SUBMITTALS

A. Complete shop drawings of all valves and appurtenances shall be submitted to the Engineer in accordance with the requirements of Section 01300.

B. The manufacturer shall furnish the Engineer two (2) copies of an affidavit stating that the valve and all materials used in its construction conform to the applicable requirements of ANSI/AWWA valve, and that all tests specified therein have been performed and that all test requirements have been met.

C. The Engineer shall be furnished two (2) copies of affidavit that the "valve protection testing" has been done and that all test requirements have been met.

D. The Engineer shall be furnished with two (2) copies of affidavit that inspection, testing and rejection are in accordance with AWWA Standard.

PART 2 - PRODUCTS

2.01 BALL VALVES

A. Ball valves shall have double union ends to permit removal of the valve without disconnecting the pipeline and shall be of the type which will not leak when the downstream union end is disconnected.

B. Viton "O" ring seals shall be used with teflon seats. Ball valves shall be installed with the flow arrow pointed in the direction of flow to permit disconnection of downstream piping.

C. During installation, the valve handle shall be oriented for ease of operation by rotating the valve body about its axis prior to tightening the ends.

D. Where indicated on the Drawings, the valve shall be equipped with a pointer and scale plate which will indicate the position of the valve at all times.

2.02 CHECK VALVES

A. Check valves 3 inches and larger shall be iron body, stainless mounted, full opening, swing type check valves with bolted covers and flanged ends. Flanges shall be faced and drilled in accordance with the 125-pound ANSI Standard. Valves shall comply with AWWA Standard C508 latest revision.

B. Valves shall be equipped with outside lever and weight and shall be manufactured by M&H Valve Company, or equal.

C. Valves shall be designed for working pressures as follows:

Valve Size (Diameter)	Pressure
3 to 12 inches	175 psi
14 to 24 inches	150 psi
30 inches and larger	120 psi

D. Check valves smaller than 3 inches in size shall be 200-pound WOG minimum bronze or all brass swing check valves. Valves shall have screw-on cap and renewable composition disks. Valve body shall be as herein specified for gate valves.

E. Check valves in pipelines carrying sewage or sludge shall be installed horizontally.

2.03 PLUG VALVES

A. Plug valves shall conform to the latest revision of AWWA C507 and shall be of the non-lubricated eccentric type with resilient plugs faced with natural or synthetic rubber suitable for service in sewage and sludge piping. Plugs shall be one piece solid ductile iron, ASTM A536. All plugs shall have a cylindrical seating surface.

B. Port areas shall be rectangular and unobstructed when open and have smoothly shaped waterways of one hundred percent (100%) of standard, full pipe area regardless of the CV values.

C. Valve bodies shall be straight-through design with flushing port to maximize flow capacity and reduce headloss. Valve bodies shall be constructed of ASTM A126 class B cast iron, suitable for 125-pound working water pressure and shall have raised seats.

D. Valves 3 inches and larger shall have seats of a welded in overlay of not less than 90 percent (90%) pure nickel or other acceptable material.

E. Valves less than 3 inches shall have plastic-covered seats.

F. Valves shall have permanently lubricated upper and lower stainless steel bushings on plug journal ends. Valve bodies shall be provided with grit excluders in the upper and lower journal areas.

G. Valves shall have bolted bonnets. The valve stem packing shall be externally adjustable and provided with a spacer bonnet in order to allow visual inspection of the packing chamber. The packing shall be adjustable and replaceable without removing the bonnet of the valve and/or with the valve under pressure. Valves with non-adjustable packing shall not be acceptable.

H. Valves 6 inches and larger shall be gear-operated with hand wheels and valves smaller than 6 inches shall be wrench operated, except as hereinafter specified or indicated on the Drawings. Gear operators shall have a stainless steel input shaft.

I. Where there is a lack of space for the valve wrench to operate gear operators, hand wheels shall be provided in lieu of the wrench.

J. Chain operators, consisting of sprocket wheels, chain guides and operating chains shall be provided for all valves with operator centerlines located more than 6 feet 6 inches above the operating level. Operating chain shall be galvanized and shall extend within 3 feet of the operating level.

K. Gear operators shall be totally enclosed, worm gear type, permanently lubricated, and shall be watertight and dust tight.

L. Gear operators shall be provided with adjustable stops for the open and closed position to prevent over travel, and shall have a valve disk position indicator.

M. A suitable lever or wrench shall be provided for each six wrench operated valves but at least one wrench for each operating station. Wrenches or wheels and chains shall be of suitable size and sufficient length for easy operation of the valves at their rated working pressure.

N. Plug valves 2-1/2 inches and smaller shall have screwed ends.

O. Plug valves 3 inches and larger shall have mechanical joint or flanged ends faced and drilled in accordance with 125-pound ANSI Standard.

P. Plug valves shall be PEF Series as manufactured by DeZurik, or equal.

2.04 GATE VALVES

A. All gate valves shall be of the resilient wedge type, iron body, non-rising stem. Valves shall be of standard manufacture and of the highest quality both as to materials and workmanship and shall conform to the latest revisions of AWWA Specification C-509. Valves 2" through 12" shall have a rated working pressure of 250-psi and valves 12" through 24" shall have a rated working pressure of 200-psi.

B. Gate valves for buried service shall be furnished with mechanical joint end connections, unless otherwise shown on the Drawings or specified herein. The end connection shall be suitable to receive ductile iron or PVC pipe.

C. Gate valves for meter pits, pump stations, or other installations as shown on the Drawings shall be furnished with flanged joint end connections and hand wheel operator. The gate valve shall have the direction of opening cast on the rim of the hand wheel and provided with chain and lock.

D. All gate valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working pressure cast on the body of the valve. Valves 18" and larger shall be provided with gear actuators.

E. Buried service gate valves shall be provided with a 2-inch square operating nut and shall be opened by turning to the left (counterclockwise).

F. Buried service gate valves shall be installed in a vertical position with valve box as detailed on the Drawings. They shall be set vertically and properly adjusted so that the cover will be in the same plane as the finished surface of the ground or paved surface (concrete, bituminous, etc.).

G. Valves shall be those manufactured by Mueller, M&H Valve Company, American, or equal.

2.05 SOLENOID VALVES

A. Solenoid valves shall be bronze body, screwed-end, single integral seat, full pipe area, globe type valves, with renewable composition disk seats.

B. Solenoid enclosures shall meet NEMA Type 4X requirements with coils epoxy encapsulated and suitable for high ambient temperatures (140 degrees F). NEMA 7 enclosures shall be provided in Class I or Class II hazardous areas.

C. Valves shall be suitable for operation on 120 volt, single-phase, 60 Hz current, and designed to open when energized.

D. The solenoid valves shall be manufactured by Automatic Valve Co., Inc., Indianapolis, IN; J.D. Gould Co., Indianapolis, IN; Automatic Switch Co., Florham Park, NJ; Magnatrol Valve Corp., Hawthorne, NJ; or equal.

2.06 TAPPING SLEEVES AND VALVES

A. Tapping sleeves and valves shall consist of a split cast iron sleeve tee with mechanical joint ends on the main and a flange on the branch, and a tapping type gate valve with one flange end and one mechanical joint end.

B. The valve shall, in general, conform to the requirements hereinbefore specified for gate valves and shall be furnished with a 2-inch square operating nut.

C. The Contractor shall be responsible for verifying the outside diameter of the pipe to be correct. Sleeves and valves shall be manufactured by M&H Valve & Fittings, Div. of Dresser, Inc., Anniston, AL; Clow Corporation, Chicago, IL; Traverse City Iron Works, Traverse City, MI; or equal.

2.07 MUD VALVES

A. Mud valves shall be located and sized as indicated on the Drawings and as specified herein. Mud valves shall be designed for basin drain applications, and shall be of the non-rising stem type. Mud valves shall be constructed entirely of stainless steel. All hardware shall be stainless steel. Valves shall have flanged end configurations.

B. The valves shall be furnished with operating nuts to be located at the positions shown on the Drawings. They shall also be furnished with extension stems, stem guides if required, and bench stands.

C. The mud valves shall be as manufactured by H. Fontaine LTD., Quebec Canada, Clow Corporation, or equal.

2.08 TELESCOPING VALVES

Telescoping valves shall be equipped with hand wheel operated floorstands and shall be sized as indicated on the Drawings. Valves shall be as manufactured by Troy Valve, H. Fontaine LTD., Quebec Canada, or equal.

2.09 AIR RELEASE AND AIR/VACUUM VALVES

A. The combination valve shall be of the type that automatically exhausts large quantities of air during the filling of a system and allows air to re-enter during draining or when a vacuum occurs. Valves shall also release small quantities of air as they gather in the valve body during normal operation. The over-all height less back wash accessories shall not exceed 21 inches.

B. All back wash accessories shall be furnished and assembled to the valve, consisting of an inlet shut-off valve clear water inlet valve, rubber supply hose and quick disconnect couplings.

C. All parts of the valves and the operating mechanisms shall be made of non-corrodible materials.

D. On sewage or sludge lines, the combination air/vacuum valve shall be 2-inch unless noted otherwise, model D-025 as manufactured by A.R.I. USA, Inc., or equal.

2.10 SLIDE GATES

A. Self-contained slide gates shall be rising stem, fabricated gates complete with frames and anchor rods, plate disk, stem, and bench stand. All metal parts, with the exception of the stem and bench stand shall be of aluminum. Stems shall be made of stainless steel. Bench stands are described hereinafter.

B. Side frame shall be made of extruded aluminum members having a slot in which the disk shall be guided. The bottom frame members shall be an aluminum tee or an angle to serve as a flat seat for the rubber seat on the bottom edge of the disk.

C. The disk shall be reinforced as necessary to prevent buckling and to support the attachment for the stem.

D. The top frame member or concrete structure shall support the bench stand as indicated on the Drawings.

E. The slide gates shall be flush bottom fabricated metal gates made by H. Fontaine LTD., Quebec, Canada; Rodney-Hunt Machine Co., Orange, MA; or equal.

F. Manually lifted slide gates shall have embedded or surface mounted frames and shall be as indicated on the Drawings and as herein specified.

G. Disk and frame shall be 6061-T6 aluminum alloy and temper designation of the Aluminum Association. Disk shall be formed from aluminum plate and frames for the disk shall be of extruded aluminum. The handle shall be of the same material as the gates.

H. Frame shall be set into the concrete as the concrete is being placed. The frame shall be straight and true, and shall permit the gates to be moved easily and to seat tight without binding.

2.11 DOWNWARD OPENING WEIR GATES

A. Weir gates shall be supplied with all the necessary parts and accessories required for a complete, properly operating installation. All parts except for the stem shall be manufactured from ASTM B-209 Alloy 6061-T6 Aluminum. Stem and guides shall be manufactured from ASTM A-276 type 304L stainless steel. Weir gates shall conform to the applicable requirements of AWWA C501's latest edition.

B. The frame shall be of the frame back design welded to form a rigid one-piece frame suitable for mounting on a concrete wall. The guide slot shall be provided with an ASTM D-1248 ultra high molecular weight polyethylene (UHMWPE).

C. The slide shall consist of a flat plate reinforced with additional structural members to limit deflection to 1/720 of the gate's span under the design loading conditions.

D. The seals shall be made of UHMWPE of the self-adjusting type. A compression cord shall ensure contact in all positions providing a watertight seal. A watertight seal shall be maintained under design head conditions. Leakage shall not exceed 0.1 gallon per minute (gpm) per foot of seal periphery under seating head and 0.2 gpm per foot for the unseating head.

E. Stems and couplings shall be manufactured of stainless steel designed to transmit in compression at least 2 times the rated output of the operating mechanism with a 40 pound effort on the crank. The stem shall have a slenderness ratio less than 200 and be provided with machined cut threads of the ACME type.

F. For stems more than one-piece, individual sections shall be joined by solid couplings.

G. Gates with widths equal to or greater than two times the height shall be provided with two lifting mechanisms connected by a tandem shaft.

H. Weir gates shall be manufactured by H. Fontaine LTD., Quebec, Canada; Rodney-Hunt Co., Orange, MA; or equal. All weir gates shall be products of the same manufacturer.

2.12 SLUICE GATES

A. Sluice gates shall conform to the AWWA Standard for sluice gates (C501-80) and as

supplemented hereinafter. Sluice gates shall be manufactured by H. Fontaine LTD., Quebec Canada; Rodney-Hunt Co., Orange, MA; or equal. All sluice gates shall be products of the same manufacturer.

B. The general equipment provided under this section shall be fabricated, assembled, erected and placed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions and recommendations of the equipment manufacturer unless exceptions are noted by the engineer.

C. Large rectangular thimbles shall be provided with holes in the invert to allow satisfactory concrete placement beneath the thimble, where required.

D. Sluice gates shall be substantially watertight under the design head conditions. Under the design seating head, the leakage shall not exceed 0.05 gallon per minute per foot of seating perimeter. Under the design unseating head, the leakage for heads of 20 feet or less shall not exceed 0.1 gallon per minute per foot of perimeter. The sluice gates shall be designed to withstand the design head show in the schedule.

E. The gates sealing system shall have been tested through a cycle test in an abrasive environment and should show that the leakage requirements are still obtained after 25,000 cycles. These documents shall be provided to the engineer and owner in the submittal package.

F. All gates shall be self contained and of the non-rising stem type.

G. The gate frame shall be constructed of structural members of formed plate welded to form a rigid one-piece frame and fabricated from 304L stainless steel. The frame shall be of the flange back design suitable for mounting on a concrete wall, wall thimble or standard pipe flange as shown on the drawings. The frame configuration shall be of the flush-bottom type and shall allow the replacement of the top and side seals without removing the gate frame from the concrete or wall thimble. The yoke shall be 304L stainless steel.

H. The slide shall consist of a flat plate reinforced with formed plates or structural members to limit its deflection to 1/720 of the gate’s span under the design head. The slide shall be fabricated from 304L stainless steel.

I. The guides shall be made of UHMWPE (ultra high molecular weight polyethylene) and shall be of such length as to retain and support at least two-thirds (2/3) of the vertical height of the slide in the fully open position. Side and top seals shall be made of UHMWPE of the self-adjusting type. A compression cord made of Nitrile shall ensure contact between the UHMWPE guide and the gate in all positions. The sealing system shall maintain efficient sealing in any position of the slide and allow the water to flow only in the opened part of the gate. The bottom seal shall be made of resilient neoprene set into the bottom member of the frame and shall form a flush-bottom.

J. The operating stem shall be of 303 MX stainless steel and designed to transmit in

compression at least 2-times the rated output of the operating manual mechanism with a 40LB effort on the crank or hand wheel. The stem shall have a slenderness ratio less than 200. The threaded portion of the stem shall have machined cut threads of the Acme type. For stems in more than one piece and with a diameter of 1-3/4 inches and larger, the different sections shall be joined together by solid couplings. Stems with a diameter smaller than 1-3/4 inches shall be pinned to an extension tube. Gates having and equal to or greater than 2-times their height shall be provided with two lifting mechanisms connected by a tandem shaft. The lifting nut shall be bronze.

K. If the gates are mounted directly to a concrete wall, an EPDM gasket shall be provided for mounting between the frame and the wall. Rising stem gates shall be provided with a clear stem tube cover.

2.13 VALVE BOXES

A. Each buried stop and valve shall be provided with a suitable valve box. Boxes shall be of the adjustable, telescoping, heavy-pattern type with the lower part of cast iron and the upper part of steel or cast iron. They shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.

B. The upper or sliding section of the box shall be provided with a flange having sufficient bearing area to prevent undue settlement. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and rest on the valve bonnet.

C. The boxes shall be adjustable through at least 6 inches vertically without reduction of the lap between sections to less than 4 inches.

D. The inside diameter of boxes for valves shall be at least 4-1/2 inches, and the lengths shall be as necessary for the depths of the valves or stops with which the boxes are to be used.

E. Covers for valves shall be close fitting and substantially dirt-tight.

F. The top of the cover shall be flush with the top of the box rim. An arrow and the word OPEN to indicate the direction of turning to open the valve shall be cast in the top of the valve covers.

2.14 FLOORSTANDS

A. Floorstands shall be hand wheel or crank operated as indicated on the Drawings or as required to suit the application.

B. Hand wheel operated type shall be without gear reduction and crank-operated type will have either single or double gear reduction depending upon the lifting capacity required. Each type shall be provided with a threaded cast bronze lift nut to engage the operating stem. Tapered roller bearings shall be provided above and below a flange on the operating nut to support both opening and closing thrusts. Floor stands shall develop

their maximum capacity with not greater than a 40-pound pull on the crank or hand wheel. Gears, where required, shall be steel with machined cut teeth designed for smooth operation. The pinion shafts on crank-operated floorstands, either single or double ratio, shall be supported on tapered roller bearings or other approved bearings. All components shall be totally enclosed in a cast iron case and cover. Positive mechanical seals will be provided on the operating nut and the pinion shafts to exclude moisture and dirt and prevent leakage of lubricant out of the hoist. Lubricating fittings shall be provided for the lubrication of all gears and bearings. Floorstands shall include a cast iron pedestal with the input shaft or hand wheel approximately 36 in. above the operating floor. An arrow with the word OPEN shall be cast on the floorstand or hand wheel indicating the direction of rotation to open.

C. Floorstands for rising stem sluice gates shall have clear, transparent, rigid, plastic stem covers.

D. Floorstands for non-rising stem sluice gates shall have stem indicators.

E. Floorstands shall be provided by the valve or gate manufacturer with each valve or gate requiring floorstands.

2.15 T-HANDLE OPERATING WRENCHES

T-handle operating wrenches shall be provided in the number and lengths necessary to permit operation of all valves by operators of average height working in normal positions.

2.16 FLOOR BOXES

A. The floor boxes shall be cast iron with a bronze bushing of the size necessary to accommodate the extension stem. The boxes shall be suitable for installation in a concrete floor of the thickness indicated on the Drawings.

B. They shall be similar to those made by Mueller Co., Decatur, IL; Clow Corporation, Chicago, IL; or equal.

2.17 PRESSURE GAUGES

A. Pressure gauges shall have cast brass cases with bourdon tubes and precision rotary movements of bronze, nickel, or other material suitable to the environment in which they will be located. Dials shall be 6 inches in diameter with a pressure range of 0 to 50 psi. Provide female quick coupler for connection to corporation stop.

B. Corporation stops shall be similar to Mueller and shall have iron pipe threads with pack joint connection outlets. Provide male quick coupler for attachment of pressure gauge.

C. Pressure gauges shall have a snuffer to prevent shock damage to gauges. Pressure gauges shall be diaphragm sealed.

2.18 FIBERGLASS LINE MARKER

A. General:

1. Design: The continuous fiberglass reinforced composite line marker (CRM-375) shall be a single piece marker capable of simple, permanent installation by one person using a manual driving tool. The CRM-375 upon proper installation shall resist displacement from wind and vehicle impact forces. The CRM-375 shall be of a constant flat "T" cross sectional design with reinforcing support ribs incorporated longitudinally along each edge to provide sheeting protection and structural rigidity. The bottom end of the marker shall be pointed for ease of ground penetration.
2. Material: The CRM-375 marker shall be constructed of a durable, UV resistant, continuous glass fiber and marble reinforced, thermosetting composite material which is resistant to impact, ozone, and hydrocarbons within a service temperature range of -40^0 F to $+140^0$ F.
3. Workmanship: The CRM-375 marker shall exhibit good workmanship and shall be free of burns, discoloration, cracks, bulges or other objectionable marks which would adversely affect the marker's performance or serviceability.
4. Marking: Each CRM-375 shall be permanently marked "Sewer Line Below". The letters shall be a minimum of 2 inches in height. A black line shall be stamped horizontally across the front of the marker near the bottom to indicate proper burial depth as shown in the standard detail.

B. Physical and Mechanical Requirements:

1. Dimensions: The CRM-375 marker shall conform to the shape and overall

dimensions shown in the standard detail.

2. Mechanical Properties: The CRM-375 shall have the minimum mechanical properties as shown in the following table:

Property	ASTM Test Method	Minimum Value
Ultimate Tensile Strength	D-638	50,000 psi
Ultimate Compressive Strength	D-638	45,000 psi
Specific Gravity	D-792	1.7
Weight % Glass Reinforcement	D-2584	50%
Barcol Hardness	D-2583	47

3. Color Fastness: The CRM-375 shall be pigmented throughout the entire cross-section so as to produce a uniform color which is an integral part of the material. Ultraviolet resistant materials shall be incorporated in the construction to inhibit fading or cracking of the delineator upon field exposure.
4. Vehicle Impact Resistance: The Carsonite CRM-375 marker shall be capable of self-erecting and remain functional after being subjected to a series of ten head on impacts by a typical passenger sedan at 35 m.p.h. The CRM-375 shall retain a minimum of 60 percent (60%) of its sheeting.

C. Reflectors:
1. The reflector shall be of impact resistant, pressure sensitive retroreflective sheeting which shall be subject to approval by the Engineer. The sheeting shall be of appropriate color to meet MUTCD requirements.
2. Mounting: The retroreflective sheeting shall consist of a minimum of a three-inch wide strip placed a maximum of two inches from the top of the post unless otherwise specified.

2.19 SURGE RELIEF VALVE

A. General:
1. The angle surge relief valve shall be heavily constructed cast iron body with a ductile iron cover/spacer to withstand severe shock conditions. The body shape shall be 90^0 angle patter to permit side or downward discharge.
2. The cover/spacer shall provide an air gap between the surge valve and the hydraulic cylinder. The valve stem shall be connected to the hydraulic cylinder by menas of a self-aligning universal connector to ensure smooth positive opening without biding during shock opening of the valve.
3. The hydraulic cylinder shall be removable from the valve, without dismantling or removing the valve from the line.
4. Closing speed shall be externally adjustable by means of a micrometer control valve.

5. The valve disc shall be normally closed against the system operating pressure by means of a spring or springs. When the system pressure exceeds the normal operating pressure by 10%, the valve shall open immediately to relieve the pressure surge and close slowly as the system pressure returns to normal, by means of the hydraulic cylinder. The hydraulic cylinder shall be capped on both ends (totally enclosed) to prevent dirt or dust from fouling up the cylinder operation. It shall be fitted with an atmospheric oil reservoir.
6. The shut-off pressure shall be set at the factory, but additional adjustments can be made in the field by increasing or decreasing the tension on the externally adjustable springs.
7. Valve exterior to be painted with primer.
8. All materials shall be certified in writing to conform with ASTM specifications.
9. Valve to be APCO Series 3000 Angle Surge Relief Valve, as manufactured by Valve & Primer Corporation; Schaumburg, Illinois; GA Industries, Inc., or equal.

2.20 FLANGED PRESSURE SENSORS

A. General:
1. The sensor shall be flanged and bolted directly into ANSI flanged pipelines. Face-to-face shall be no greater than a wafer style of a butterfly valve. The flanges shall have thru bolt holes to enable positive alignment in the pipeline. Inside diameter of the sensor shall be the same as the mating pipe with a full thru uninterrupted flow. There shall be no dead ends or crevices and flow passage shall make the sensor self-cleaning.
2. The pressure sensing ring shall measure pressure for 360^0 around the full inside circumference of the pipeline. The sensing ring shall also be clamped into the body for the full radial width of the sensor. Pressure shall be transmitted to the gauge by a locked in and sealed fluid such as ethylene glycol or silicone oil. The sensor shall have an auxiliary tapped and plugged port to allow filling connection of other equipment.
3. All sensors shall be Series 40, as manufactured by the Red Valve Co., Carnegie, PA., or equal.

2.21 FLAP VALVES

A. Flap gates shall be entirely constructed of 304 stainless steel. All hardware shall be 304 stainless steel. The frame shall be made of structural members or formed plate welded to form a rigid one-piece frame. The frame shall be of the flange back design suitable for mounting on a concrete wall or standard pipe flange. The gate cover shall be made of structural members or formed plate adequately reinforced to withstand the maximum specified seating head. Seals shall be made of resilient neoprene attached to the body by means of a retainer ring for flaps up to 24-inches. The hinges shall consist of a stainless steel hinge pin and shall have a UHMWPE bushing. Flap valves shall be Fontaine series 60 or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Valves shall be installed as nearly as possible in the positions indicated on the Drawings consistent with conveniences of operating the hand wheel or wrench. All valves shall be carefully erected and supported in their respective positions free from all distortion and strain on appurtenances during handling and installation.

B. All material shall be carefully inspected for defects in workmanship and material, all debris and foreign material cleaned out of valve openings and seats, all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness.

C. Valves and other equipment that do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense.

D. Valves shall not be installed with stems below the horizontal.

E. Valves shall be set plumb and supported adequately in conformance with the instructions of the manufacturer. Valves mounted on the face of concrete shall be shimmed vertically and grouted in place. Valves in the control piping shall be installed so as to be easily accessible.

F. Where chain wheels are provided for remote operation of valves, two S-shaped hooks shall be provided for each valve to enable the chains to be hooked so as not to interfere with personnel traffic.

G. Valves shall be provided with extension stems where required for convenience of operation. Extension stems shall be provided for valves installed underground and elsewhere so that the operating wrench does not exceed 6 feet in length.

H. A permanent type gasket of uniform thickness shall be provided between flanges of valves and sluice gates and their wall thimble.

I. Wall thimbles shall be accurately set in the concrete walls so that the gates can be mounted in their respective positions without distortion or strain.

J. Plug valves in horizontal sewage and sludge piping shall be installed with the shaft horizontal such that when in the open position, the plug is located in the upper part of the valve body. Valves shall be oriented so that in the closed position, the plug is at the downstream end of the valve.

K. Floorstand operators and stem guides shall be set so that the stems shall run smoothly in true alignment. Guides shall be anchored firmly to the walls. Distances from the centerlines of gates to the operating level or base of floorstand shall be checked by the

Contractor and adjusted if necessary to suit the actual conditions of installation.

3.02 PAINTING

A. Valves shall be factory primed and fully coated, inside and out, with epoxy paint in accordance with the valve manufacturer's recommendation.

B. All valve vault piping, valves, and other metal products that are not stainless steel or hot-dip galvanized shall receive 2-3 mils of 1074 Endurashield II as manufactured by The Tnemic Company, or equal, over the factory primer.

END OF SECTION 02642

SECTION 02675 - DISINFECTION OF POTABLE WATER PIPE

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all labor, material and water necessary to disinfect the potable water pipe as shown on the Drawings and specified herein.

1.02 RELATED WORK

A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.

B. Section 02610 - Water Pipe and Fittings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DISINFECTION OF WATER MAINS

A. All water pipe shall be disinfected by the use of chlorine or chlorine compound in such amounts as to produce a concentration of at least 50 ppm and a residual of at least 25 ppm at the end of the twenty-four (24) hours. Pipes shall be thoroughly flushed upon meeting the chlorine residual requirements. Before the pipes are placed in service, samples of the water must be taken by the Contractor and submitted to the State Department of Health for testing. No pipes shall be placed in service until the samples have been approved by the Health Department. The Contractor shall bear all the cost of sampling, testing, and postage. The cost of the disinfection and sampling shall be included in the unit price of the pipe.

B. Copies of the results of the testing shall be submitted to the Owner and/or Engineer.

END OF SECTION 02675

SECTION 02731 - GRAVITY SEWERS

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all labor, material, and equipment necessary to install gravity sewer piping together with all appurtenances as shown and detailed on the Drawings and specified herein.

1.02 RELATED WORK

A. Section 02222 - Excavation.

B. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS

A. Ductile Iron (DI) Pipe:

1. Ductile iron pipe shall conform to ANSI A21.50 (AWWA C150) and ANSI A21.51 (AWWA C151) (latest revision). The pipe shall be designed for an internal working pressure of 150 psi and external loading based on flat bottom trenches without blocks and untamped backfill-laying conditions. The pipe shall have a minimum pressure class of 150 psi.
2. Fittings shall be ductile iron fittings in accordance with AWWA C153.
3. Joints shall be push-on type or mechanical joint type conforming to ANSI A21.11 (AWWA C111). Unless specifically required at designated locations by the Drawings, the type of joint used is optional.

   a. Push-on joints shall have an annular recess in the pipe socket to accommodate a single rubber gasket. Plain ends shall be suitably beveled to permit easy entry into the bell. The gasket and annular recess of the socket shall be so designed and shaped that the gasket is located in place against displacement as the joint is assembled.

   D. Mechanical joints shall be bolted and of the stuffing box type and shall consist of a bell with exterior flange and interior recess for the sealing gasket, a pipe or fitting plain end, a sealing gasket, a follower gland, tee-head bolts and hexagon nuts.

4. All ductile iron pipe and fittings shall have the manufacturer's outside asphaltic coating and a cement lining and bituminous seal coat on the inside. Cement mortar lining and bituminous seal coat inside shall conform to ANSI A21.4 (AWWA C104).
5. Pipe shall be furnished in lengths of 16, 16.5, 18, or 20 feet nominal laying lengths. The weight of any single pipe shall not be less than the tabulated weight by more than 5 percent for pipe 12 inches or smaller in diameter, not by more than 4 percent for pipe larger than 12 inches in diameter.
6. The net weight, class or nominal thickness and sampling period shall be marked on each pipe. The pipe shall also be marked to show that it is ductile iron.
7. Pipe shall be as manufactured by U.S. Pipe & Foundry Company, American Cast Iron Pipe Company, or equal.

B. Polyvinyl Chloride (PVC) Pipe:

1. Solid Wall PVC Pipe (SDR 35):

   a. PVC pipe and fittings less than 15 inches in diameter shall conform to the requirements of ASTM Standard Specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, Designation D 3034. Pipe and fittings shall have a minimum cell classification of 12454B or 12454C as defined in ASTM D-1784. All pipe shall have a pipe diameter to wall thickness ratio (SDR) of a maximum of 35.
   b. PVC pipe and fitting with diameters 18-inch through 27-inch shall conform to the requirements of ASTM D-1784 and ASTM F-679. Pipe and fittings shall have a minimum cell classification of 12454C. The minimum wall thickness shall conform to T-1 as specified in ASTM F-679.
   c. Joints shall be push-on bell and spigot type using elastomeric ring gaskets conforming to ASTM D 3212 and F 477. The gaskets shall be securely fixed into place in the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.
   d. Pipe shall be furnished in lengths of not more that 13 feet. The centerline of each pipe section shall not deviate from a straight line drawn between the centers of the openings at the ends by more than 1/16 inch per foot of length.
   e. PVC pipe shall not have a filler content greater than ten percent (10%) by weight relative to PVC resin in the compound.

f. PVC pipe shall be clearly marked at intervals of 5 feet or less with the manufacturer's name or trademark, nominal pipe size, PVC cell classification, the legend "Type PSM SDR 35 PVC Sewer Pipe" and the designation "ASTM D 3034", or "ASTM F-679". Fittings shall be clearly marked with the manufacturer's name or trademark, nominal size, the material designation "PVC", "PSM" and the designation "ASTM D 3034", or "ASTM F-679".
g. PVC pipe shall have a minimum pipe stiffness of 46 psi for each diameter when measured at 5 percent vertical ring deflection and tested in accordance with ASTM D-2412.
h. Five (5) copies of directions for handling and installing the pipe shall be furnished to the Contractor by the manufacturer at the first delivery of pipe to the job. PVC pipe installation shall conform to ASTM D-2321 latest revision.
i. Pipe shall be as manufactured by H & W Pipe Company, or equal.

2. Corrugated Wall PVC Pipe with Smooth Interior:

a. Corrugated PVC pipe and fittings greater than 15 inches in diameter shall conform to the requirements of ASTM F-949. Pipe and fittings shall have a minimum cell classification of 12454B or 12454C in accordance with ASTM D-1784.
b. Joints shall be push-on bell and spigot type using elastomeric ring gaskets conforming to ASTM D 3212 and F 477. The gaskets shall be double sealed so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial waste, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.
c. Corrugated PVC pipe shall be furnished in lengths of 13 or 20 feet. The centerline of each pipe section shall not deviate from a straight line drawn between the centers of the openings at the ends by more than 1/16 inch per foot of length.
d. Corrugated PVC pipe shall have a smooth interior.
e. PVC pipe shall not have a filler content greater than ten percent (10%) by weight relative to PVC resin in the compound.
f. Corrugated PVC pipe shall be clearly marked at intervals of 5 feet or less with the manufacturer's name or trademark, nominal pipe size, PVC cell classification, the plastic "PVC", the designation "ASTM F-949", and extrusion code, including date and location of manufacture. Fittings shall be clearly marked with the manufacturer's name or trademark, nominal size, the material designation "PVC", and the designation "ASTM F-949".
g. Corrugated PVC pipe shall have a minimum stiffness of 50 psi when measured at 5 percent vertical ring deflection (tested in accordance with ASTM D-2412), as defined in ASTM F-949.

h. Five (5) copies of directions for handling and installing the pipe shall be furnished to the Contractor by the manufacturer at the first delivery of pipe to the job. PVC pipe installation shall conform to ASTM D-2321 latest revision.
i. Corrugated PVC pipe shall be A2000 as manufactured by Contech Construction Products, Inc. or approved equal.

C. Truss Pipe:

1. Truss pipe and fittings shall conform to the requirements of ASTM D-2680.
2. The thermoplastic material shall be rigid PVC plastic and shall be in accordance with ASTM D-1784. PVC plastic shall be manufactured with minimum cell classification of 12454B or 12454C.
3. The truss annulus shall be filled with cement pearlite concrete (or other inert filler material exhibiting the same degree of performance as cement pearlite concrete) to form a semi-rigid composite pipe.
4. Truss pipe and fittings shall have a minimum stiffness of 200 psi for each diameter when measured at 5 percent vertical ring deflection and tested in accordance with ASTM D-2412.
5. Joints shall be push-on bell and spigot type using elastomeric ring gaskets conforming to ASTM D-3212 and F-477. The gaskets shall be securely fixed into place in the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use. No solvent cement joints shall be allowed.
6. All field cutting of pipe shall be done in a neat, trim manner using a hand saw per manufacturer's recommendations. Care shall be taken to protect the filler material. All field cuts shall be sealed according to manufacturer's recommendations.
7. Pipe shall be furnished in lengths of not more than 13 feet. The centerline of each pipe section shall not deviate from a straight line drawn between the centers of the openings at the ends by more than 1/16 inch per foot of length.
8. PVC pipe shall be clearly marked at intervals of 5 feet or less with the manufacturer's name or trademark, nominal pipe size, PVC cell classification, the legend "PVC Composite Pipe", the designation "ASTM D-2680", and the extrusion code, including date and location of manufacture. Fittings shall be clearly marked with the manufacturer's name or trademark, nominal size, the material designation "PVC", and the designation "ASTM D-2680".
9. Five (5) copies of directions for handling and installing the pipe shall be furnished to the Contractor by the manufacturer at the first delivery of pipe to the job. PVC pipe installation shall conform to ASTM D-2680 latest revision.

10. Truss pipe shall be PVC truss pipe as manufactured by Contech Construction Products, Inc. or an approved equal.

D. Reinforced Concrete Pipe:

1. All reinforced concrete pipe shall conform to the requirements of ASTM C76-89. Class shall be as shown on the Drawings.
2. Joints shall be bell and spigot type using Forsheda 138 or Forsheda 103 gaskets (or equal) and shall conform to ASTM C443.
3. The pipe shall be furnish in standard lengths of 8 feet to 16 feet.
4. The pipe shall be permanently marked showing the nominal inside diameter, manufacture date, ASTM C76 class, and manufacturer's name. These markings for 30-inch diameter and larger shall be inscribed on the pipe exterior and stenciled on the interior with paint or permanent ink.
5. There shall be no lift holes.
6. Pipe shall be as manufactured by Independent Concrete Pipe Company, equal.
7. Coating and Lining:

    a. All concrete pipe shall be coated and lined at the pipe manufacturer's plant.
    b. The exterior coating and interior lining shall be a high build multi-component Amine cured Novalac epoxy polymeric coating/lining equal to the Protecto 401 as manufactured by Vulcan Painters, Inc. of Birmingham, AL.
    c. The coating/lining shall have a permeability rating in accordance with Method A of ASTM E-96-66.
    d. The surface preparation shall remove all loose laitance, form oils, and other loose materials and include a "brush blast" per SSPC.
    e. The coating and lining shall be applied in accordance with the manufacturer's requirements and have a minimum dry film thickness (DFT) of:

        (1) Exterior Coating: 25 mil DFT.
        (2) Interior Coating: 40 mil DFT.

8. Connection of existing and proposed sewer lines to the reinforced concrete pipe shall be accomplished by the following methods:

    a. Precast concrete fittings with joints using Forsheda 138 or Forsheda 103 gaskets (or equal) conforming to ASTM C443, or
    b. Core drilling the reinforced concrete pipe and installing a KOR-N-TEE Model 1200 GP flexible watertight connector (or equal) as manufactured by KOR-N-SEAL. Connector shall be made of EPDM rubber. All hardware shall be 304 stainless steel.

E. High Density Polyethylene Pipe:

1. Material: The polyethylene pipe shall be high performance, high molecular weight, high density polyethylene pipe equal to Driscopipe 1000 as manufactured by Phillips Driscopipe, Inc., Richardson, TX, conforming to ASTM D 1248 (Type III, Class C, Category 5, Grade P34). Minimum cell classification values shall be 3 4 5 4 3 4 C as referenced in ASTM D 3350.
2. Physical Properties of Pipe Compound:

    a. Density - The density shall be no less than 0.941 - 0.955 gm/cm^3 as referenced in ASTM D 1505.
    b. Melt Flow - Flow rate shall not be greater than 0.14gm/10 min when tested in accordance with Method D1238 - Condition E.
    c. Flex Modulus - Shall be 120,000 to less than 160,000 psi as referenced in ASTM D 790.
    d. Tensile Strength at Yield - Shall be 3000 - to less than 3500 psi as referenced in ASTM 638.
    e. ESCR - The stress crack resistance shall be in excess of 1000 hours with less than 20 percent failure when tested in accordance with ASTM D 1693 Condition C.
    f. Hydrostatic design shall be 1600 psi at 23° C when tested in accordance with ASTM 2837.
3. Owner may request certified lab data to verify the physical properties of pipe or may take random samples and have them tested at an independent laboratory.
4. Rejection: Polyethylene pipe and fittings may be rejected for failure to meet any of the requirements of this Specification.
5. Rating: The polyethylene pipe shall have a manufacturer's recommended hydrostatic design stress rating of 800 psi based on a material with a 1600 psi design basis determined in accordance with ASTM D-2837. Standard method for obtaining hydrostatic design basis for thermoplastic pipe materials.
6. Dimensions: The polyethylene sewer pipe to be nominal I.P.S. with a wall thickness minimum of SDR-32.5. The pipe shall be nominal I.P.S. size.

PART 3 - EXECUTION

3.01 PIPE LAYING

A. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the Drawings. The pipe shall be laid straight between changes in alignment and at uniform grade between changes in grade. Pipe shall be fitted and matched so that when laid in the trench, it will provide a smooth and uniform invert. Supporting of pipe shall be as set out in Section 02225 and in no case shall the supporting of pipe on blocks be permitted.

B. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure its being clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe and beveled to match the factory bevel for insertion into gasketed joints. Bevel can be made with hand or power tools.

C. The interior of the pipe, as the work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted into the pipe bell so as to exclude earth or other material and precautions taken to prevent flotation of pipe by runoff into trench.

D. All pipe shall be laid starting at the lowest point and installed so that the spigot ends point in the direction of flow.

3.02 JOINTING

All joint surfaces shall be cleaned immediately before jointing the pipe. The bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. All pipe shall be provided with home marks to insure proper gasket seating. Details of gasket installation and joint assembly shall follow the direction of the manufacturer's of the joint material and of the pipe. The resulting joints shall be watertight and flexible. **No solvent cement joints shall be allowed.**

3.03 UTILITY CROSSING CONCRETE ENCASEMENT

A. At locations shown on the Drawings, required by the Specifications, or as directed by the Engineer, concrete encasement shall be used when the clearance between the proposed sanitary sewer pipe and any existing utility pipe is 18 inches or less. Utility pipe includes underground water, gas, telephone and electrical conduit, storm sewers, and any other pipe as determined by the Engineer.

B. There are two cases of utility crossing encasement. Case I is applicable when the proposed sanitary sewer line is **below** the existing utility line. Case II is applicable when the proposed sanitary sewer line is laid **above** the utility line. In either case, the concrete shall extend to at least the spring line of each pipe involved.

C. Concrete shall be Class B (3000 psi) and shall be mixed sufficiently wet to permit it to flow between the pipes to form a continuous bridge. In tamping the concrete, care shall be taken not to disturb the grade or line of either pipe or damage the joints.

D. Concrete for this Work is not a separate pay item and will be considered incidental to utility pipe installation.

3.04 TESTING OF GRAVITY SEWER LINES

A. After the gravity piping system has been brought to completion, and prior to final inspection, the Contractor shall rod out the entire system by pushing through each individual line in the system, from manhole to manhole, appropriate tools for the removal from the line of any and all dirt, debris, and trash. If necessary during the process of rodding the system, water shall be turned into the system in such quantities to carry off the dirt, debris and trash.

B. During the final inspection, the Engineer will require all flexible sanitary sewer pipe to be mandrel deflection tested after installation.

1. The mandrel (go/no-go) device shall be cylindrical in shape and constructed with nine (9) evenly spaced arms of prongs. The mandrel dimension shall be 95 percent of the flexible pipe's published ASTM average inside diameter. Allowances for pipe wall thickness tolerances of ovality (from shipment, heat, shipping loads, poor production, etc.) shall not be deducted from the ASTM average inside diameter, but shall be counted as part of the 5 percent allowance. The contact length of the mandrel's arms shall equal or exceed the nominal diameter of the sewer to be inspected. Critical mandrel dimensions shall carry a tolerance " 0.001 inch.
2. The mandrel inspection shall be conducted no earlier than 30 days after reaching final trench backfill grade provided, in the opinion of the Engineer, sufficient water densification or rainfall has occurred to thoroughly settle the soil throughout the entire trench depth. Short-term (tested 30 days after installation) deflection shall not exceed 5 percent of the pipe's average inside diameter. The mandrel shall be hand pulled by the contractor through all sewer lines. Any sections of the sewer not passing the mandrel test shall be uncovered and the Contractor shall replace and recompact the embedment backfill material to the satisfaction of the Engineer. These repaired sections shall be retested with the go/no-go mandrel until passing.
3. The Engineer shall be responsible for approving the mandrel. Proving rings may be used to assist in this. Drawings of the mandrel with complete dimensioning shall be furnished by the Contractor to the Engineer for each diameter and type of flexible pipe.

C. The pipeline shall be made as nearly watertight as practicable, and leakage tests and measurements shall be made. All apparatus and equipment required for testing shall be furnished by the Contractor and the cost shall be included in the unit price bid for pipe and manholes.

1. The Engineer may require the Contractor to smoke test the first section (manhole to manhole) of each size of pipe and type of joint prior to backfilling,

to establish and check laying and jointing procedures. The test shall consist of smoke blown into closed-off sections of sewer under pressure and observing any smoke coming from the pipeline indicating the presence of leaks. Other supplementary smoke tests prior to backfilling may be performed by the Contractor at his option; however, any such tests shall not supplant the final tests of the completed work unless such final tests are waived by the Engineer.

2. Where the groundwater level is more than 1 foot above the top of the pipe at its upper end, the Contractor shall conduct either infiltration tests or low-pressure air tests on the completed pipeline.
3. Where the groundwater level is less than 1 foot above the top of the pipe at its upper end, the Contractor shall conduct either exfiltration tests or low-pressure air tests on the completed pipeline.

D. Low pressure air tests shall be made using equipment specifically designed and manufactured for the purpose of testing sewer lines using low-pressure air. The equipment shall be provided with an air regulator valve or air safety valve so set that the internal pressure in the pipeline cannot exceed 8 psig.

1. The test shall be made on each manhole-to-manhole section of pipeline after placement of the backfill. The Engineer or his designated representative must be present to witness each satisfactory air test before it will be accepted as fulfilling the requirements of these Specifications.
2. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be tested. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.
3. Low pressure air passing through a single control panel, shall be introduced into the sealed line until the internal air pressure reaches 4 psig greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe at the time of test. However, the internal air pressure in the sealed line shall not be allowed to exceed 8 psig. When the maximum pressure exerted by the groundwater is greater than 4 psig, the Contractor shall conduct only an infiltration test.

4. At least two minutes shall be allowed for the air pressure to stabilize in the section under test. After the stabilization period, the low-pressure air supply hose shall be quickly disconnected from control panel. The time required in minutes for the pressure in the section under test to decrease from 3.5 to 2.5 psig (greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe) shall not be less than that shown in the following table:

Pipe in Diameter in Inches	Minutes
4	2.0
6	3.0
8	4.0
10	5.0
12	5.5
15	7.5
18	8.5
21	10.0
24	11.5
30 & larger	13.5

5. When the sewer section to be tested contains more than one size of pipe, the minimum allowable time shall be based on the largest diameter pipe in the section, and shall be the time shown in the table reduced by 0.5 minutes.
6. Reinforced concrete pipe shall be tested in accordance with ASTM C 924 (joint testing shall be in accordance with ASTM C 1103). Test time shall be a function of pipe diameter and the length of installed line to be tested as provided in ASTM C 924.

E. Infiltration tests shall be made after underdrains, if present, have been plugged and other groundwater drainage has been stopped such that the groundwater is permitted to return to its normal level insofar as practicable.

1. Upon completion of a section of the pipeline, the line shall be dewatered and a satisfactory test conducted to measure infiltration for at least 24 hours. The amount of infiltration, including manholes, tees and connections shall not exceed 200 gallons per nominal inch diameter per mile of sewer per 24 hours.

F. Exfiltration tests which subject the pipeline to an internal pressure, shall be made by plugging the pipe at the lower end and then filling the line and manholes with clean water to a height of 2 feet above the top of the sewer at its upper end. Where conditions between manholes may result in test pressures, which would cause leakage at the plugs or stoppers in branches, provisions shall be made by suitable ties, braces and wedges to secure the plugs against leakage resulting from the test pressure.

1. The rate of leakage from the sewers shall be determined by measuring the amount of water required to maintain the level 2 feet above the top of the pipe.
2. Leakage from the sewers under test shall not exceed the requirements for leakage into sewers as hereinbefore specified.

G. The Contractor shall furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the tests. Suitable bulkheads shall be installed, as required, to permit the test of the sewer. The Contractor shall construct weirs or other means of measurements as may be necessary.

H. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and retesting as the Engineer may require without additional compensation.

I. If in the judgment of the Engineer, it is impracticable to follow the foregoing procedures for any reason, modifications in the procedures shall be made as required and as acceptable to the Engineer, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

3.05 INSTALLATION OF HDPE PIPE

A. Construction Practices:

1. Handling Pipe:

a. Pipe shall be stored on clean level ground to prevent undue scratching or gouging.
b. Sections of pipe with deep cuts or gouges in excess of 10 percent of the wall thickness shall be removed completely and the ends of pipeline rejoined.
c. The handling of the joined pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects.

2. Pipe Joining:

a. Sections of the polyethylene pipe shall be joined into continuous lengths on the job site above the ground. The joining method shall be the butt fusion method and shall be done in strict accordance with the pipe manufacturer's recommendation.
b. The hydraulically operated machines shall have a pressure regulator to preset the correct pressure for the desired fusion force, and there shall be an auxiliary system to control "feed" rate for the pipe face-off. Each machine shall be permanently equipped with a chart showing correct fusion pressure for each pipe size and wall thickness (SDR).

3. Direct Burial Installation:

    a. The trench and trench bottom shall be constructed in accordance with the Drawings.
    b. Embedment materials to be used shall be as recommended in ASTM D-2321-74, Section 6.
    c. The proper bedding practices to be followed shall be subject to those described in ASTM D-2321-74, Section 8.
    d. Installation practices shall be those specified in ASTM D-2321-74, Section 9.

END OF SECTION 02731

SECTION 02732 - SEWAGE FORCE MAINS

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all labor, material, and equipment necessary to install force main piping together with all appurtenances as shown and detailed on the Drawings and specified herein.

1.02 RELATED WORK

A. Section 02222 - Excavation.

B. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.

C. Section 02733 - Sewage Pump Station.

PART 2 - PRODUCTS

2.01 DUCTILE IRON PIPE (DIP) AND FITTINGS

A. Ductile iron pipe (DIP) shall conform to ANSI/AWWA C150/A21.50, ANSI/AWWA C151/A21.51 Standard (latest). The pipe shall conform to pressure class 150 unless noted otherwise. All pipe, fittings and joints should be capable of accommodating pressure up to 150 psi. The ductile iron pipe shall be as manufactured by Clow Corporation, U.S. Pipe & Foundry Company, American Cast Iron Pipe Company, or equal.

B. Fittings shall be ductile iron in accordance with AWWA C153 and have a body thickness and radii of curvature conforming to ANSI A21.10 or ANSI A21.53 for compact fittings and shall conform to the details and dimensions shown therein. Fittings shall have rubber gasket joints meeting the requirements of AWWA C111. Fittings shall be cement-mortar lined and bituminous coated to conform to the latest revision of ANSI/AWWA standards.

C. Ductile iron flanged joint pipe shall conform to ANSI/AWWA C115/A 21.15 Standard and have a thickness Class of 53. The pipe shall have a rated working pressure of 250 psi with Class 125 flanges. Gaskets shall be ring gaskets with a thickness of 1/8 inch. Flange bolts shall conform to ANSI B 16.1.

D. Flanged fittings shall meet all requirements of ANSI/AWWA C110/A21.10 and have Class 125 flanges. Fittings shall accommodate a working pressure up to 250 psi and be supplied with all accessories.

E. All pipe and fittings shall be tar coated outside and shall receive a standard cement lining

with bituminous seal coat on the inside in accordance with ASA Specification A21.40 (AWWA-C104).

F. Cement mortar lining and seal coating for pipe and fittings, where applicable shall be in accordance with ANSI/AWWA C104/A21.4. Bituminous outside coating shall be in accordance with ANSI/AWWA C151/A21.51 for pipe and ANSI/AWWA C110/A21.10 for fittings.

G. All ductile fittings shall be rated at 250 psi water working pressure plus water hammer. Ductile iron fittings shall be ductile cast-iron grade 80-60-03 per ASTM Specification A339-55.

H. Restrained joint pipe and fittings shall be a boltless system equal to "Field Lok" restraining gaskets or "TRFLEX Joint" as manufactured by U.S. Pipe & Foundry Company.

I. No separate pay item has been established for fittings and no determination of the number of fittings required on the job has been made. The Contractor, during the bidding phase, shall determine the number of fittings required on the job and include the cost of the fittings and installation in the Contract unit price.

2.02 POLYVINYL CHLORIDE (PVC) FORCE MAIN PIPE

A. Polyvinyl chloride (PVC) pipe for force mains shall be Class 200 (SDR 21) PVC pressure rated pipe with integral bell joints with rubber O-ring seals.

B. All PVC pipe shall conform to the latest revisions of ASTM D-1784 (PVC Compounds), ASTM D-2241 (PVC Plastic Pipe, SDR) and ASTM D-2672 (Bell - End PVC Pipe). PVC pipe shall have a minimum cell classification of 12454B or 12454C ad defined in ASTM D-1784. Rubber gasketed joints shall conform to ASTM D-3139. The gaskets for the PVC pipe joint shall conform to ASTM F-477 and D-1869.

C. Fittings shall be ductile iron and in accordance with Article 2.01 B of this section.

D. All pipe and couplings shall bear identification markings that will remain legible during normal handling, storage and installation, which have been applied in a manner that will not reduce the strength of the pipe or coupling or otherwise damage them. Pipe and coupling markings shall include the nominal size and OD base, material code designation, dimension ratio number, ASTM Pressure Class, ASTM designation number for this standard, manufacturer's name or trademark, seal (mark) of the testing agency that verified the suitability of the pipe material for sanitary sewer service. Each marking shall be applied at intervals of not more than 5 feet for the pipe and shall be marked on each coupling.

2.03 POLYETHYLENE PIPE

A. Polyethylene pipe shall be of high density, high molecular weight polyethylene and conform to the requirements of ASTM Specification D-3350 (SDR 21) and have recommended designation values of 3-4-5-4-3-4-C. Fittings shall be SDR 9.3.

B. Pipe shall have dimensions and workmanship in accordance with ASTM F-714.

C. Polyethylene pipe shall be supplied in standard lengths of at least 12 feet 6 inches. Longer lengths are permitted.

D. Polyethylene pipe shall be marked with the manufacturer's name, production lot number, ASTM designation, and nominal diameter.

E. Polyethylene pipe shall be joined by the butt-fusion technique utilizing controlled temperature and pressure to produce a fused, leak-free joint, stronger than the pipe itself in both tension and hydrostatic loading.

F. Pipe shall be Phillips Driscopipe, or equal.

PART 3 - EXECUTION

3.01 LAYING DEPTHS

In general, force mains shall be laid with a minimum cover of 30 inches, except as otherwise indicated on the Drawings.

3.02 RELATIONSHIP TO WATER LINE

Where a force main and water line cross one another, the force main shall be laid under the water line and encased with concrete in accordance with Section 02731 and as detailed on the Drawings.

3.03 PIPE LAYING

A. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the Drawings. Pipe shall be fitted and matched so that when laid in the Work, it will provide a smooth and uniform invert. Supporting of pipe shall be as set out in Section 02225 and in no case shall the supporting of pipe on blocks be permitted.

B. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure it being clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fittings shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without

additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe. Bevel can be made with hand or power tools.

C. The interior of the pipe, as the Work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted so as to exclude earth or other material and precautions taken to prevent floatation of pipe by runoff into trench.

D. Anchorage of Bends:

1. At all tees, plugs, caps and bends of 11-1/4 degrees and over, and at reducers or in fittings where changes in pipe diameter occur, movement shall be prevented by using suitable harness, thrust blocks or ballast. Thrust blocks shall be as shown on the Drawings, with sufficient volumes of concrete being provided; however care shall be taken to leave weep holes unobstructed and allow for future tightening of all nearby joints. Unless otherwise directed by the Engineer, thrust blocks shall be placed so that pipe and fitting joints will be accessible for repair.
2. Bridles, harness or pipe ballasting shall meet with the approval of the Engineer. Steel rods and clamps shall be galvanized or otherwise rust-proofed or painted.
3. No extra pay shall be allowed for work on proper anchorage of pipe, fittings or other appurtenances. Such items shall be included in the price bid for the supported item.

3.04 JOINTING

All joint surfaces shall be cleaned immediately before jointing the pipe. The bell or groove shall be lubricated in accordance with the pipe manufacturer's recommendations. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. All pipe shall be provided with home marks to insure proper gasket seating. Details of gasket installation and joint assembly shall follow the direction of the manufacturer's of the joint material and of the pipe. The resulting joints shall be watertight and flexible.

3.05 TESTING OF FORCE MAINS

A. The completed work shall comply with the provisions listed herein, or similar requirements which will insure equal or better results. Suitable test plugs, water pump or other equipment and apparatus, and all labor required to properly conduct the tests shall be furnished by the Contractor at no expense to the Owner.

B. Force main piping shall be pressure tested to 250 percent of the normal system operating pressure or to 150 percent of the rated working pressure of the pipe, whichever is less. At no time shall the test pressure exceed 150 percent of the pipe's rated working pressure. A pipe section shall be accepted if the test pressure does not fall more than 5 percent during the 4-hour period.

C. All piping shall be tested for leakage at a pressure no less than that specified for the pressure test. The leakage shall be less than an allowable amount determined by the following equation:

$$L = \frac{ND\,(P)^{1/2}}{7400}$$

Where L = allowable leakage (gallon/hour)
N = number of joints in length of pipeline tested
D = nominal diameter of pipe (inches)
P = test pressure (psig)

D. Should the sections under test fail to meet the requirements, the Contractor shall do all work locating and repairing the leaks and retesting as the Engineer may require without additional compensation.

E. If in the judgement of the Engineer, it is impracticable to follow the foregoing procedures for any reason, modifications in the procedures shall be made as required and as acceptable to the Engineer, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

END OF SECTION 02732

SECTION 02733 - SEWAGE PUMP STATION

PART 1 - GENERAL

1.01 WORK INCLUDED

The Work to be accomplished under this Section of the Specifications consists of the furnishing of all labor, materials, equipment, and services necessary for the construction of duplex pump stations and valve pits, as shown on the Contract Drawings. The station shall include two (2) raw sewage pumps, liquid level sensors, discharge piping, pump mounting plates with sealed discharge connection, bottom rail supports, upper rail supports, lifting chain, aluminum access hatch, electrical controls, and any other items required to make the installation function as its design intent; all installed in, on, or near a precast concrete basin. Structure and dimensions shall be as shown on the Contract Drawings.

1.02 CONTRACTOR REQUIREMENTS

The Contractor shall submit certified shop and erection drawings, and data regarding pump and motor characteristics and performance. The data shall include performance curves based on actual shop tests of pumping units, which show that the units meet the specified requirements for head, capacity, efficiency, and horsepower for the various capacities specified. Except as hereinafter specified, certified tests of mechanically duplicate units will be acceptable. Curves shall be submitted on 8-1/2 inch by 11-inch sheets. For units of the same size and type, only curves for a single unit need be provided. Shop drawings for accessory equipment shall also be submitted. Shop drawings for electrical equipment and systems furnished herein shall be provided as specified under electrical work.

a. Pump Performance Curves.
b. Station Drawings for Accessories.
c. Electrical Motor Data.
d. Control Drawing and Data.
e. Typical Installation Guides.
f. Technical Manuals.
g. Parts List.
h. Printed Warranty.
i. Manufacturer’s Equipment Storage Recommendations.

1.03 RELATED WORK

A. Section 02642 - Sewage Valves and Gates

B. Section 02731 - Gravity Sewers.

C. Section 02732 - Sewage Force Mains.

D. Section 02735 - Manholes.

E. Section 03310 - Structural Concrete.

F. Section 16000 - Electrical Work.

PART 2 - PRODUCTS

2.01 SOLIDS-HANDLING PUMPS

A. SCOPE

Furnish Qty. 2 HOMA 8-inch discharge, electric submersible wastewater pump(s), each consisting of a single stage, non-clog, centrifugal pump, close-coupled to a squirrel cage induction type electric motor assembled in a single-body, watertight aggregate, capable of maintaining its watertight integrity submerged under 65 feet of water. The pumps(s) shall be designed to handle raw, unscreened sewage, storm water, sludge, or similarly contaminated liquid at an operating point of 1,000 GPM at 70 ft. TDH with a hydraulic efficiency of at least 50.4 %.Shut-off head shall be 150 ft. minimum. As this pump is utilized for solids handling, it must be capable of repeatedly passing non-compressible, spherical solids up to 3-inch in diameter. The motor shall be 40 HP designed for operation with a 200A, 3 phase, 60 HZ, 460 volt electrical supply. Each motor shall be connected for operation with 30 feet of power and control cable.

The motor shall be approved for operation in Class 1 Division 1, Groups C & D Areas by Factory Mutual (FM)/UL.

Pumps shall be manufactured by Homa, or equal and as indicated in the following schedule:

Pump Station	Model Number	Max HP	Manufacturer	Design Point (C-140)	Impeller Size
Cookie Factory PS	1750rpm 8-inch	40	Homa	1,000 GPM @ 70’ TDH	12.0”

B. PUMP CONSTRUCTION

All major castings shall be of ASTM A-48, Class 40B gray, cast iron with smooth surfaces devoid of porosity, irregularities, or other defects. All exposed fasteners shall be of AISI 304 stainless steel. All exterior surfaces not constructed of stainless steel shall be protected by a factory-applied, two-part, high solids epoxy paint.

Sealing design between castings shall incorporate Nitrile (Buna-N) O-rings in controlled compression in two planes of the sealing interface. The interfaces shall be machined, metal-to-metal contacts and shall not require a specific torque on the securing fasteners to ensure sealing. Rectangular cross sectioned gaskets which require specific torque limits to achieve compression are susceptible to uneven compression and may be compressed beyond the point of permanent deformation; therefore they shall not be acceptable.

C. WET WELL INSTALLATION

For automatic operation in a wet well, an auto-coupling assembly shall be supplied for the retrieval of pumps, to eliminate the need for entering the wet well for service. This system shall consist of a permanently installed base elbow in the wet well and a removable guiding flange to be attached to the pump discharge. The auto-coupling discharge flange shall be ANSI Class 125 lb. cast iron in 4-inch size. Both the base elbow and the guiding flange shall be made of ASTM A-48, Class 40B cast iron. The guiding flange shall utilize a dual rail system with two rigid guide pipes connected to the base elbow to reliably provide a self-engaging, firm, leak-proof coupling between the pump discharge and the elbow. In order to maximize reliability of this sealing, systems that utilize a single rail, or non-rigid guiding systems such as cable or line shall not be considered acceptable.

Sealing shall be accomplished through the use of a field-replaceable, Nitrile (Buna-N) profile gasket that is axially and evenly compressed upon contact to positively seal the pump discharge against the base elbow. Sealing systems that rely on metal-to-metal contact faces are subject to leaking and blow-by and shall not be considered acceptable.

For ground or portable installation, a ring stand shall be supplied to attach to the bottom of the pump in order to prevent any part of the pump from bearing directly on the basin floor.

D. IMPELLER

The impeller shall be cast as one piece of ASTM A-48, Class 40B Cast Iron, statically and dynamically balanced. The impeller shall be of the multi-vane closed (double-shrouded) non-clog design, and shall meet the Ten State Standards requirement for minimum solids passage of 3-inches. Upon request, the manufacturer must certify a test of a static solids passing test to confirm the supplied pump is capable of passing 3-inch non-compressible solids in a static configuration. Impellers that are not capable of passing a 3-inch, non-compressible solid in a static state, or which require axial movement in order to pass shall not be considered acceptable. Impellers that require adjustment over time in order to maintain proper tolerance to the volute shall not be acceptable.

E. VOLUTE

The volute shall be cast in one piece of ASTM A-48, Class 40B Cast Iron with smooth contours and surfaces to provide obstruction-free passageways with low friction losses.

The discharge flange of the volute shall have a standard ANSI or DIN bolt pattern. Proprietary bolt patterns shall not be acceptable.

F. WEAR RING

On multi-vane closed (double-shrouded) impellers, tolerance between the nose of the impeller and the suction flange of the volute shall be controlled by a pair of replaceable wear rings. A stationary wear ring cast from ASTM B505 Bronze shall be press fit into the volute suction, and an integral wear ring shall be cast into the nose of the impeller in ASTM A-48, Class 40B Cast Iron. Wear systems that require routine adjustment in order to maintain tolerances shall not be acceptable.

G. BEARINGS

The shaft shall be supported by pre-lubricated, anti-friction bearings. These bearings shall be non-proprietary and shall be produced and branded by a major manufacturer of bearings. The bearings shall have an L-10 life of 100,000 hours at the pump's Best Efficiency Point (BEP). The lower, impeller-side bearing shall be a double-row, deep groove, angular contact ball bearing, axially-retained, to sustain both axial and radial loads. The upper, motor-end bearing shall be a single-row, deep groove ball bearing, axially floating, to sustain radial loads only.

H. SEALS

The motor shall be protected from water intrusion by a tandem mechanical seal arrangement. The mechanical seals shall be of a non-proprietary design and shall be produced and branded by a major manufacturer of mechanical seals. The seals shall operate in an isolated oil chamber, which shall provide lubrication and cooling. One seal shall prevent intrusion from the pumped medium into the oil chamber, and the second seal shall prevent intrusion from the oil chamber into the motor. Each seal shall utilize one stationary silicon-carbide seal face, and one rotating silicon carbide seal face positively driven by its own spring and utilize Nitrile (Buna-N) elastomers. The springs shall be protected from the pumped medium, and under no circumstances shall solid particles accumulate on the external spring and hamper its effectiveness. Seals shall not require routine maintenance except periodic inspection of the oil chamber.

In order to prevent damaging particles in the pumped media from interfering with the seal, the top shroud of the impeller shall maintain a close tolerance to a matching surface in the wall of the volute. This tolerance shall be small enough that potentially damaging particles in the pumped media are unable to pass. Arrangements that rely on cutting systems to reduce the size of particles or those that rely on directing particles away from the seal shall not be acceptable.

Seal systems that utilize a common single or double spring acting between the upper and lower seal, any system that utilizes pressure differential to ensure proper sealing, seals utilizing mechanical locking devices such as set screws or pins to hold the seal in place,

and any proprietary seal not produced and branded by a major mechanical seal manufacturer shall not be allowed.

I. SEAL FAILURE EARLY WARNING SYSTEM

In order to warn of seal failure and allow the pump to be shut down before moisture reaches the motor, the pump shall be supplied with an early warning system, consisting of a conductive seal probe to be installed in the seal oil chamber. This probe shall monitor for leakage and shall provide early warning of potential seal failure before moisture reaches the motor. Systems which utilize less reliable mechanical leakage detectors shall not be acceptable. Systems which rely upon detectors in the motor housing shall not be considered an early warning system and shall not be acceptable.

J. MOTOR

The motor shall be an air-filled, submersible, squirrel cage, induction-type motor of the NEMA type B design. The motor shall be housed in a watertight enclosure capable of continuous operation at a submergence of 65 feet, and made of ASTM A-48, Class 40B Cast Iron. Fitting the stator into the enclosure with the use of bolts, pins, or other fastening devices which would require penetration of the housing shall not be acceptable.

The stator windings shall be insulated with moisture-resistant Class-H insulation. In each phase winding, there shall be embedded a bi-metallic temperature sensor, wired in series and interlocked with the motor overload protection in the control panel. Any of these thermal switches shall cut out electric power if the temperature in its winding exceeds 140°C (284°F), and shall automatically reset when the winding temperature returns to normal conditions.

The motor shall be non-overloading through the selected performance curve and shall perform in accordance with NEMA MG1, Part 30. The motor shall be rated for continuous operation in environments up to 104°F or intermittently up to 140°F, and shall be capable of sustaining 15 starts per hour. Motors shall be available to meet NEMA MG1, Part 31 and VFD-rated if required.

The motor shall be approved for operation in Class 1 Division 1, Group C & D Areas by Factory Mutual (FM)/UL.

K. SHAFT

The pump and motor shaft shall be an integral, one-piece unit composed of AISI 430 Stainless Steel. Shafts that utilize carbon steel, two-piece or sleeved construction shall not be considered acceptable. The maximum allowable shaft deflection at the shaft seal shall not be more than 0.002 inches while within operating range.

L. CABLE ENTRY

Each cable entry assembly shall contain a cylindrical elastomer grommet, flanked by two washers, closely fitted to the cable O.D. A watertight seal shall be maintained by screwing a threaded cable entry gland into a cable inlet flange which bolts into the motor cap. The cable entry shall not require a specific torque to ensure watertight integrity. The gland shall incorporate a strain-relief and anti-kink feature that shall function independently from the separate sealing action. For pumps over 10.5 horsepower, an isolated junction chamber containing the terminal board shall be sealed from the motor by means of a watertight isolation plate.

The cable entry shall be approved for operation in Class 1 Division 1, Group C & D Areas by Factory Mutual (FM)/UL.

2.02 LIQUID LEVEL CONTROLS

The liquid level of the wetwell shall be measured and controlled by a NoShok 613 SST transducer with Cage and PUR Cable with 3-year warranty, or equal. The transducer shall be housed in a PVC stilling well.

Two (2) float sensors, supported by a stainless steel float bracket, shall serve as an independent backup system as shown on the drawings. The backup float system shall be designed such that the transducer system serves as the primary control system and only if the transducer AND/OR transducer controller is non-responsive does an independent "backup" float/control system operate. The upper float shall serve as "ALARM" and shall also initiate the operation of both pumps with a five second delay between the start of each pump. The lower float shall serve as "ALL OFF" and shall also silence the alarm. The level control system shall be manufactured by RSJ Rhombus, or equal.

All systems must be operated and installed in accordance with Division 16 as well as the manufacturer's instructions.

2.03 BASIN

The wetwell and valve pit basins shall be constructed of a monolithic precast manhole bottom section of the appropriate thickness, precast manhole barrels, and a precast manhole top. The wetwell shall have a Xypex, or equal admixture in the concrete mix when cast to help prevent hydrogen sulfide corrosion.

2.04 ACCESS FRAME AND COVER

Access hatch assemblies shall be installed in the top slab of the wetwell and valve pit at the location shown on the Drawings. Frames and covers shall be fabricated of aluminum and shall be rated for 300 psf and have a bitumastic coating on all surfaces that are in contact with concrete. Frame shall support guide rails and be securely mounted over the pumps and valves. Covers shall be provided with lifting handle and safety latch to hold the cover in the 90-degree open position. Locking hasps shall be provided with lock and

two (2) keys. Covers shall be of the checkered plate design. Wetwell frame and cover shall be sized in accordance with the Drawings and the pump manufacturer's requirements. Hatch shall be as manufactured by the Bilco Company, or equal.

2.05 PIPE AND FITTINGS

A. Discharge piping and fittings within the wetwell and valve pit shall be ductile iron with flanged joints and shall comply with the requirements for force main piping in Section 02732. Pipes from the wetwell to point of connection with force main shall be ductile iron with compression or mechanical joints. All flange ductile iron piping inside the wetwell shall be assembled with stainless steel bolts and receive one coat of bituminous coating over the factory primer.

B. Gravity influent pipe from collection lines to the wetwell shall comply with the requirements of Section 02731.

2.06 VALVES, SLEEVES, AND PRESSURE GAUGES

A. Check valves, plug valves, tapping sleeves, and pressure gauges shall be in accordance with Section 02642.

B. Corporation stops shall be similar to Ford Products and shall have iron pipe threads with pack joint connection outlets. Provide male quick coupler for attachment of pressure gauge.

2.07 ELECTRICAL CONTROLS

A. See electrical schematic drawings and Specification Division 16 for power and control requirements.

PART 3 - EXECUTION

3.01 GENERAL

The Contractor shall furnish and install as detailed, at the elevations given and where shown on the Drawings, complete duplex, pump stations capable of handling raw, unscreened domestic sewage. The stations shall include submersible non-clog sewage pumps, liquid level sensors, discharge piping, valves, electrical controls and alarm system, and a precast concrete wet well and valve pit.

3.02 BEDDING, BACKFILL AND FINISH GRADING

A. Bedding shall be as shown on the drawings. Class I (No. 9 crushed stone aggregate) backfill material shall be placed around the pump station to within 18 inches of the surface of the surrounding ground, with sufficient allowance for settlement. The

remaining fill shall be earth material free of rocks in the areas of piping and excavated material in all other areas. Rock and/or shale excavation may be placed in the top 18 inches of fill, but shall not be above piping or any closer than 12 inches from finished grade.

B. All fill shall be placed so as to load structures symmetrically. Rough grading shall be held below finish grade and then topsoil which has been stockpiled in work of Section 02211, shall be evenly spread over the surface.

C. Grading shall be brought to the levels shown on the Drawings or to elevations established by the Engineer. Final dressing shall be accomplished by hand work or machine work, or a combination of these methods as may be necessary to produce a uniform and smooth finish to all parts of the re-grade.

D. The entire disturbed area around the pump station shall be seeded in accordance with Section 02930.

3.03 PUMP TESTS

A. The Contractor shall furnish sworn certificates to the effect that the pump castings have passed the hydrostatic pressure tests hereinbefore specified.

B. Pump tests shall be conducted on **each** pump as hereinafter specified. During each test, the pump shall be run at each head condition for a sufficient time to permit accurate determination of discharge, head, and power input. Certified copies of the test data shall be furnished to the Engineer for review prior to shipment. All tests shall be run in accordance with the Standards of the Hydraulic Institute.

C. The pump manufacturer shall warrant the equipment with a standard five (5) year prorated warranty.

3.04 ACCEPTANCE TESTS

A. After installation of the pumping equipment, and after inspection, operation, testing, and adjustment have been completed by the manufacturer's representative, each pump shall be given a running test in the presence of the Engineer during which it shall determine its ability to operate without vibration or overheating, and to deliver its rated capacity under the specified conditions. During the tests, observations shall be made of head, capacity, and motor input. All defects or defective equipment revealed by or noted during the tests shall be corrected or replaced promptly at the expense of the Contractor, and if necessary, the tests shall be repeated until results acceptable to the Engineer are obtained. The Contractor shall furnish all labor, piping, equipment, and materials necessary for conducting the tests.

B. All adjustments necessary to place the equipment in satisfactory working order shall be made at the time of the above tests.

C. The Contractor shall provide water for testing.

D. In the event that the Contractor is unable to demonstrate to the satisfaction of the Engineer that the units will satisfactorily perform the service required and that they will operate free from vibration and heating, the pumping units may be rejected. The Contractor shall then remove and replace the equipment at his own expense. The limits of vibrations as set forth in the 13th Edition of the Standards of the Hydraulic Institute shall govern. Field service report shall include all vibration readings made.

3.05 SPARE PARTS

A. The Contractor shall furnish and deliver to the Owner at the site of the Work the following spare parts, all of which shall be identical and interchangeable with similar parts installed in the Work.

B. The Contractor shall provide for **each** pump the following spare parts:

1. One (1) Repair kit to include mechanical seals, bearings, and gaskets/o'rings.

C. Spare parts shall be packed in suitable boxes or containers bearing labels clearly designating the contents and the piece of equipment for which they are intended.

D. Spare parts shall be delivered at the same time as the equipment to which they pertain. The Contractor shall properly store and safeguard such spare parts until completion of the Work, at which time they shall be delivered to the Owner.

3.06 TOOLS AND MANUALS

A. Furnish one (1) complete set of tools required for routine maintenance, together with any special tools required for such purpose. Tools shall be supplied in a substantial steel tool box.

B. The manufacturer shall further provide two (2) copies of a complete and detailed Installation and Maintenance Manual. This manual shall cover, in addition to installation and general operating procedures, the operation, maintenance, and servicing procedures of the major individual components provided with the pumping equipment. The manual shall be shipped with the pumps.

3.07 WARRANTY

A. The manufacturer shall provide a full five (5) year warranty including all parts and labor from the date of acceptance that all equipment will be free from defects in design, material, and workmanship.

B. Warranties and guarantees by the suppliers of various components in lieu of a single

source responsibility by the manufacturer will not be accepted. The manufacturer shall assume prime responsibility for the guarantee of the station and all components.

C. In the event a component fails to perform as specified or is proven defective in service during the guarantee period, the manufacturer shall provide a replacement part without cost to the Owner. He shall further provide, without cost, such labor as may be required to replace, repair or modify major components such as the station structure, pumps, pump motors, sewage piping manifold, etc. After start-up service has been performed, the labor to replace accessory items shall be the responsibility of others.

D. The replacement or repair (including cost of parts and labor) of those items normally consumed in service, such as pump seals, oil, grease, etc., shall be considered as part of routine maintenance and station upkeep.

E. It is not intended that the manufacturer assume responsibility for contingent liabilities or consequential damages of any nature resulting from defects in design, material, workmanship or delays in delivery, replacement, or otherwise.

END OF SECTION 02733

SECTION 02735 - MANHOLES

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all labor, material, and equipment necessary to construct manholes for sanitary sewers, including steps, frames and covers, together with all appurtenances as shown and detailed on the Drawings and specified herein. Manhole materials shall be precast concrete.

1.02 RELATED WORK

A. Section 02731 - Gravity Sewers.

B. Division 3 - Concrete.

C. Section 02733 – Sewage Pump Station

1.03 DEFINITIONS

A. Standard Manhole: A standard manhole is defined as any manhole that is greater than 4 feet in depth, as measured from the invert of the manhole base at its center to the bottom of the manhole frame.

B. Shallow Manhole: A shallow manhole is defined as any manhole that is 4 feet or less in depth, as measured in the preceding sentence.

PART 2 - PRODUCTS

2.01 CONCRETE MANHOLES - GENERAL

A. Manholes shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the Drawings or bound in the Specifications.

B. All concrete manholes shall have precast reinforced concrete developed bases. No other type of base will be allowed. Invert channels shall be factory constructed when the base is made. Sloping invert channels shall be constructed whenever the difference between the inlet and outlet elevation is 2 feet or less.

C. The concrete manhole walls (barrels and cones) shall be precast concrete sections. The top of the cone shall be built of reinforced concrete adjustment rings to permit adjustment of the frame to meet the finished surface. Minimum strength of the concrete for the precast sections shall be 4,000 psi at the time of shipment.

D. For concrete manholes, the inverts of the developed bases shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent, within the manhole, to the centerlines of adjoining pipelines.

E. For concrete manholes, the cast-iron frames and covers shall be the standard frame and cover as indicated on the Drawings and specified hereinafter in this Section.

F. Manholes shall be manufactured by Sherman Dixie, Oldcastle, or equal.

2.02 PRECAST CONCRETE SECTIONS

A. Precast concrete sections and appurtenances shall conform to the ASTM Standard Specifications for Precast Reinforced Concrete Manhole Sections, Designation C478, latest revision, with the following exceptions and additional requirements.

B. The base section shall be monolithic for 4-foot diameter manholes. Manholes with diameter of 5 feet or larger shall have base slab.

C. The wall sections shall be not less than 5 inches thick.

D. Type II cement shall be used except as otherwise permitted.

E. Joints between sections shall be made watertight through the use of rubber 0-ring gaskets or rubber profile gaskets such as Forsheda 138. Gaskets shall conform to the ASTM Standard C-443, latest revision. Rope mastic or butyl mastic sealant will not be allowed except as noted in Article 2.02 F.

F. Butyl mastic sealant shall be installed between the cone section, any adjusting sections or rings, and casting.

2.03 CONCRETE MANHOLE - FRAMES AND COVERS

A. The Contractor shall furnish all cast-iron manhole frames and covers conforming to the details shown on the Drawings, or as herein before specified.

B. The castings shall be of good quality, strong, tough, evengrained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.

C. All casting shall be thoroughly cleaned and subject to a careful hammer inspection.

D. Castings shall be at least Class 25 conforming to the ASTM Standard Specifications for Gray Iron Casting, Designation A48, latest revision.

E. Unless otherwise specified, manhole covers shall be 22-3/4 inches in diameter, weighing not less than 350 pounds per frame and cover. Manhole covers shall set neatly in the rings, with contact edges machined for even bearings and tops flush with ring edge. They shall have sufficient corrugations to prevent slipperiness. The covers shall have two (2) pick holes about 1-1/4 inches wide and 1/2 inches deep with 3/8-inch undercut all around. Covers shall not be perforated. Frames and covers shall be J.R. Hoe and Sons, Mc-350, or approved equal.

F. All covers shall be marked in large letters "SANITARY SEWER" in the center.

2.04 MANHOLE STEPS (CONCRETE MANHOLES)

Manholes steps shall be the polypropylene plastic type reinforced with a deformed steel rod. The steps shall be of the size and configuration as shown on the Drawings. Steps shall line up over the downstream invert of the manhole. The steps shall be embedded into the manhole wall a minimum of 3-3/8 inches. Steps shall be uniformly spaced at 12-inch to 16-inch intervals.

2.05 PREMOLDED ELASTOMERIC-SEALED JOINTS

All holes for pipe connections in concrete barrels and bases shall have a factory-installed flexible rubber gasket to prevent infiltration. The manhole boots shall conform to the latest revision of ASTM-C973. The boots shall be Contour Seal or Kor-N-Seal made by National Pollution Control Systems, Inc., Nashua, NH; A-Lok Manhole Pipe Seal made by A-Lok Corporation, Trenton, NJ; or an approved equal.

2.06 POLYETHYLENE DIAPHRAGM

A. Polyethylene diaphragm manhole inserts shall be manufactured from corrosion-proof material suitable for atmospheres containing hydrogen sulfide and diluted sulfuric acid. Diaphragm shall be installed in all new manholes as indicated on the Drawings.

B. The body of the manhole insert shall be made of high density polyethylene copolymer material meeting ASTM Specification D 1248, Class A, Category 5, Type III (the insert shall have a minimum impact brittleness temperature of -180 degrees fahrenheit). The thickness shall be uniform 1/8 inches or greater. The manhole insert shall be manufactured to dimensions as shown on the Drawings to allow easy installation within the manhole frame.

C. Gaskets shall be made of closed cell neoprene. The gasket shall have a pressure sensitive adhesive on one side and shall be placed under the weight-bearing surface of the insert by the manufacturer. The adhesive shall be compatible with the manhole insert material so as to form a long lasting bond in either wet or dry conditions.

D. Lift strap shall be attached to the rising edge of the bowl insert. The lift strap shall be

made of 1 inch wide woven polypropylene web and shall be seared on all cut ends to prevent unraveling. The lift strap shall be attached to the manhole insert by means of a stainless steel rivet. Location of the lift strap shall provide easy visual location.

E. Standard ventilation shall be by means of vent hole on the sidewall of the manhole insert approximately 3/4-inches below the lip. The vent hole will allow a maximum release of 10 gallons per 24 hours when the insert is full.

F. The manhole insert shall be manufactured to fit the manhole frame rim upon which the manhole cover rests. The Contractor is responsible for obtaining specific measurements of each manhole cover to insure a proper fit. The manhole frame shall be cleaned of all dirt, scale and debris before placing the manhole insert on the rim.

2.07 CLEANOUTS

Cleanouts shall be extended to finish grade and capped with a clean-out plug in accordance with details and at locations shown on the Drawings. Pipe shall be the same as the gravity sewer line in which the cleanout is located. A 4-inch thick concrete pad, 2 feet 0-inches square, with the valve box lid section, shall be provided around each cleanout.

2.08 DROP CONNECTIONS

Drop connections shall be installed in the manhole as shown on the Drawings.

PART 3 - EXECUTION

3.01 FABRICATION - PRECAST SECTIONS

A. Manhole sections shall contain manhole steps accurately positioned and embedded in the concrete when the section is cast.

B. Sections shall be cured in an enclosed curing area and shall attain a strength of 4,000 psi prior to shipment.

C. No more than two (2) lift holes or inserts may be cast or drilled in each section.

D. Flat slab tops shall have a minimum thickness of 6 inches and reinforcement in accordance with ASTM C478.

E. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the precast sections.

F. Acceptance of the sections will be on the basis of material tests and inspection of the completed product and test cylinders if requested by the Engineer.

G. Cones shall be precast sections of similar construction.

3.02 SETTING PRECAST MANHOLE SECTIONS

A. Precast-reinforced concrete manhole sections shall be set so as to be vertical and with sections and steps in true alignment.

B. Rubber gaskets shall be installed in all manhole joints in accordance with the manufacturer's recommendations.

C. All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose.

3.03 ADJUSTING MANHOLE FRAMES AND COVERS TO GRADE

A. Except where shown on the Drawings, the top of the precast concrete eccentric cone of a standard manhole or the top of the flat slab of a shallow manhole shall terminate 4 inches below existing grade in an unpaved non-traffic area except in a residential yard and 13 inches below existing grade in a paved or unpaved traffic area and in a residential yard. The remainder of the manhole shall be adjusted to the required grade as described hereinafter in paragraphs B and C of this article.

B. When a manhole is located in an unpaved non-traffic area other than in a residential yard, the frame and cover shall be adjusted to an elevation 3 inches to 5 inches above the existing grade at the center of the cover. If field changes have resulted in the installed manhole invert elevation to be lower than the invert elevation shown on the Drawings, the adjustment to an elevation of 3 inches to 5 inches above existing grade shall be accomplished by the use of precast concrete rings. If field changes have resulted in the completed manhole invert to be greater than the invert shown on the Drawings and the cover higher than 5 inches above existing grade, then the top of the eccentric cone, when used, or the top of the barrel section, when used, shall be trimmed down so that the manhole cover, after installation, is no greater than 5 inches above existing grade at the center of the cover. The area around the adjusted frame and cover shall be filled with the required material, sloping it away from the cover at a grade of 1 inch per foot.

C. When a manhole is located in a bituminous, concrete, or crushed stone traffic area, or in a residential yard, the frame and cover shall be adjusted to the grade of the surrounding area by the use of precast concrete rings. The adjusted cover shall conform to the elevation and slope of the surrounding area. If field changes have resulted in the installed manhole invert elevation to be so much higher than the invert elevation shown on the Drawings that the top of the eccentric cone, when used, or the top of the flat slab, when used, is less than the thickness of the frame and cover 7 inches from the grade of the surrounding area, then the top of the cone or barrel section shall be trimmed down enough to permit the cover, after installation, to conform to the elevation and slope of the surrounding area. After installation, the

inside and outside surfaces of the brick shall receive a waterproofing bitumastic coating.

1. The Contractor shall coordinate elevations of manhole covers in paved streets with the Owner. If resurfacing of the street in which sewers are laid is expected within twelve (12) months, covers shall be set 1-1/2 inches above the existing pavement surface in anticipation of the resurfacing operations.

3.04 ADJUSTING SECTIONS

Only clean adjusting sections shall be used. Each adjusting section shall be laid in a bead of butyl mastic sealant and shall be thoroughly bonded.

3.05 SETTING MANHOLE FRAMES AND COVERS

A. Manhole frames shall be set with the tops conforming to the required elevations set forth herein before. Frames shall be set concentric with the top of the concrete and in a full bead of butyl mastic sealant so that the space between the top of the masonry and the bottom flange of the frame shall be completely watertight.

B. Manhole covers shall be left in place in the frames on completion of other work at the manholes.

3.06 EXFILTRATION TESTING

The Contractor shall conduct exfiltration tests to ensure that connections and joints in sanitary sewer manholes are watertight. Exfiltration tests shall be performed in accordance with ASTM C 969, Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines. The maximum allowable exfiltration rate shall be 0.1 gallon per foot diameter, per foot of head, per hour. If the exfiltration rate exceeds this value, the Contractor shall make repairs as required **including re-testing**, at no additional costs to the Owner. **Vacuum testing of the sanitary sewer manholes may be used in lieu of the exfiltration test.**

3.07 VACUUM TESTING OF MANHOLES

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

1. Lift holes, if any, shall be plugged with an approved, non-shrinkable grout prior to testing.
2. Drop connections shall be installed prior to testing.
3. The vacuum test shall include testing of the seal between the cast iron frame and the concrete cone, slab or grade rings.
4. The manholes shall be backfilled and finished to design grade.

B. Testing Procedure:

1. Temporarily plug, with the plugs being braced to prevent the plugs or pipes from being drawn into the manhole, all pipes entering the manhole at least eight inches into the sewer pipe(s). The plug must be inflated at a location past the manhole/pipe gasket.
2. The test head shall be placed inside the frame at the top of the manhole and inflated, in accordance with the manufacturer's recommendations.
3. A vacuum of 10 inches of mercury shall be drawn on the manhole. The valve on the vacuum line to the manhole shall be shut and the vacuum line disconnected.
4. The pressure gauge shall be liquid filled, having a 3.5-inch diameter face with a reading from zero to thirty inches of mercury.
5. The manhole shall be considered to pass the vacuum test if it holds at least 9 inches of mercury for the following time durations:

	Time (Minutes)		
Manhole Depth	4' Dia.	5' Dia.	6' Dia.
20 feet or less	1	2	3
20.1 to 30 feet	2	3	4

6. If a manhole fails the vacuum test, the manhole shall be repaired with a non-shrinkable grout or other suitable material based on the material of which the manhole is constructed and retested, as stated above.
7. All temporary plugs and braces shall be removed after each test.

END OF SECTION 02735

SECTION 02830 - FENCES AND GATES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall furnish and erect the fence and gates as indicated on the Drawings and as herein specified.

B. The chain link fence shall have a top rail and bottom tension wire, and three (3) strands of barbed wire projecting outward at the top.

C. The chain link fence materials and installation shall meet or exceed the standards of the Chain Link Fence Manufacturers Institute, New York, NY, except as otherwise specified in this Section. Fence materials shall meet or exceed Federal Specification RR-F-191H/GEN for fencing, wire and post metal (gates, chain link fence fabric, and accessories), and shall conform to the ASTM Standard Specifications hereinafter noted.

D. Fence framework, fabric, and accessories.

E. Excavation for post bases.

F. Concrete anchorage for posts and center drop for gates.

G. Manual gates and related hardware.

1.02 RELATED WORK

Division 3 - Concrete.

1.03 REFERENCES

A. ANSI/ASTM A123: Zinc (hot galvanized) coating of products fabricated from rolled, pressed, and forged steel shapes, plates, bars, and strips.

B. ANSI/ASTM F567: Installation of chain link fence.

C. ASTM A120: Pipe, steel, black and hot-dipped zinc-coated (galvanized) welded and seamless, for ordinary uses.

D. ASTM C94: Ready-mixed concrete.

E. FS RR-F-191: Fencing, wire, post, and metal.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in commercial quality chain link fencing.

B. Installation: ANSI/ASTM F567.

1.05 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01300.

B. Include plan layout, grid, spacing of components, gates, accessories, fittings, hardware, anchorages, and schedule of components.

C. Submit manufacturer's installation instructions under provisions of Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Chain Link–Fence Framework: ASTM A120; Schedule 40 steel pipe, standard weight, one (1) piece without joints.

B. Agriculture Fence shall be rectangular wire mesh fence (9 gauge min.) with 4” round pressure treated post at 12’ O.C. ± with one strand of barbed wire along top.

2.02 CONCRETE MIX

Concrete shall be accordance with Division 3.

2.03 CHAIN LINK FENCING

A. All ferrous metal fittings, posts, fence and gate framework, and all accessories shall be galvanized with a heavy coating of 2.0 ounces pure zinc spelter per square foot of surface area to be coated using the hot-dip process. Thinner zinc coatings and electro-galvanizing will not be used as a substitute for the specified hot-dip galvanized finish.

B. All fabrication and welding shall be done before hot-dip galvanizing. All welding shall conform to the American Welding Society standards.

C. The chain link fence fabric shall be galvanized steel chain link fabric conforming to ASTM Standard Specification for zinc-coated steel chain link fence fabric, Designation A392-74, with Class 2 zinc coating (2.0 ounces of zinc per square foot of uncoated wire surface). The fabric shall be woven in 2-inch mesh from No. 9 gage wire in a 7-foot width with barbed salvages top and bottom.

D. The barbed wire shall be galvanized steel barbed wire consisting of two (2) strands of twisted No. 12 1/2-gage wires with 4-point barbs spaced 3 inches apart and conforming to ASTM Standard Specification of zinc-coated (galvanized) steel barbed wire, Designation A121-77, with Class 3 zinc coating (minimum of 0.80 ounces of zinc per square foot of uncoated wire surface for No. 12 1/2-gage wire).

E. The tension wire shall be No. 7 gage coil spring steel wire with galvanized finish having minimum 0.80 ounces of zinc coating per square foot of uncoated wire surface.

F. Tie wires for fastening fence fabric to line posts and rails shall be not less than No. 6 gage aluminum wire.

G. Line posts shall be 2-3/8 inches outside diameter steel pipe weighing not less than 3.65 pounds per foot, or 1-7/8 inches high carbon steel H-beams weighing not less than 2.70 pounds per foot.

H. End, corner, and pull posts shall be 2-7/8 inches outside diameter steel pipe weighing not less than 5.79 pounds per foot, or 2-1/2 inches square steel tube weighing not less than 5.14 pounds per foot, or 3-1/2 inches roll-formed, steel corner section weighing not less than 5.14 pounds per foot.

I. Gate posts for gate leaves up to and including 6-foot wide, shall be 2-7/8 inches outside diameter steel pipe weighing not less than 5.79 pounds per foot or 3-1/2 inches by 3-1/2 inches roll-formed, steel corner section weighing not less than 5.14 pounds per foot.

J. Gate posts for gate leaves over 6-foot wide, including 13 feet wide shall be 4 inches outside diameter steel pipe weighing not less than 9.10 pounds, outside diameter steel pipe weighing not less than 9.10 pounds per foot.

K. Top railings and railing for top, middle and bottom braces between terminal posts and adjacent line posts shall be 1-5/8 inch outside diameter steel pipe weighing not less than 2.27 pounds per foot, or 1-5/8 inches by 1-1/4 inches, 14 gage roll-form section.

L. Diagonal truss braces between terminal and adjacent line posts and for gate framework shall be 3/8-inch diameter steel rod.

M. Barbed wire support arms shall project outward from the top of the posts at 45 degrees and shall be capable of withstanding a 200-pound downward pull on the outermost end of arm, without failure. The arms shall have provision for the attachment of three (3) strands of evenly spaced barbed wire. Arms shall be integral with post top weather caps having holes for the passage of the top trail at intermediate posts.

N. Fittings shall be heavy duty malleable iron or pressed steel of suitable size to produce strong construction.

O. Stretcher bars for attaching fabric to terminal posts such as end, corner, pull, or gate posts and gate frames shall be flat bars with minimum cross-section dimensions of not less than 1/4-inch by 3/4-inch. The stretcher bars shall be the full height of the fabric and shall be secured with bar bands of not less than 11 gage sheet steel, spaced approximately 15 inches on centers and bolted with 3/8-inch diameter bolts.

P. Gate leave framework shall be 1-7/8 inches outside diameter steel pipe weighing not less than 2.72 pounds per foot.

Q. If bolted or riveted corner fittings are not used, the gate frame shall be hot-dip galvanized after welding.

R. Gate hinges shall be of heavy pattern of adequate strength for the gate size, with large bearing surfaces for clamping or bolting in position.

S. The gates shall be provided with a suitable latch accessible from both sides and with provision for padlocking.

T. Double leaf swing gates shall have a center bolt, center stop, and automatic backstops to hold leaves in open position.

U. Gate padlocks shall have solid brass cases, hardened steel shackles, removable core cylinders, and galvanized steel chains attached to the shackle by a clevis. Padlocks shall be manufactured by Eaton Corporation Lock & Hardware Division, of Emhart Corporation, Berlin, CT; Best Universal Lock Company, Inc., Indianapolis, IN; or equal. The padlocks shall be furnished with two (2) keys each and keyed on the project master key system.

2.04 FINISHES

A. Galvanized: ANSI/ASTM A123; 1.8 ounce per square foot coating.

B. Accessories: Same finish as framing and fabric.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The fence and gates shall be erected by skilled mechanics.

B. Post spacing shall be uniform with maximum spacing of 10 feet in fences erected along straight lines. All posts shall be placed plumb and centered in the concrete foundations.

C. Post foundations in earth shall be concrete cylinders with a minimum diameter of 12 inches, crowned at grade to shed water, and shall not be less than 36 inches deep in the

ground. Posts shall be set in the full depth of the foundations except for 3 inches of concrete under the posts.

D. If foundation holes are excavated in peat or other unstable soil, the Engineer shall be notified for determination of suitable construction precautions.

E. If solid ledge is encountered without overburden of soil, posts shall be set into the rock a minimum depth of 12 inches for line posts and 18 inches for terminal posts. Post holes shall be at least 1 inch greater in diameter than the post, and the grout shall be thoroughly worked into the hole so as not to leave voids, and shall be crowned at the top to shed water. Where solid rock is covered by an overburden, the total setting depths shall not exceed the depths required for setting in earth, and the posts shall be grouted into the rock as described.

F. Any change in direction of the fence line of 20 degrees or more shall be considered corners. Pull posts shall be used at any abrupt change in grade.

G. Maximum area of unbraced fence shall not exceed 1,500 square feet.

H. Terminal posts shall be braced to adjacent posts with horizontal brace rails and diagonal truss rods brought to proper tension so that posts and plumb.

I. There shall be no loose connections or sloppy fits in the fence framework. The fence framework shall withstand all wind and other forces due to the weather.

J. Fabric shall be stretched taut and tied to posts, rails and tensions wires with the bottom edge following the finished grade not more than 2 inches above the grade. The fabric shall be installed on the security side of the fence and shall be anchored to the framework so that the fabric remains in tension after pulling force is released. The fabric shall be attached to line posts with ties spaced at not more than 15-inch intervals and to rails and braces at no more than 24-inch intervals. The fabric shall be attached to the tension wire with hog ring ties on 24-inch centers.

K. Three (3) strands of barbed wire shall be installed on each extension arm of the line fence and at the top of each gate. The wires shall be pulled taut and fastened at each support.

L. Gates shall be installed plumb, level, and secure for the full width of the opening and the hardware adjusted for smooth operation. Provide concrete center drip to foundation depth and drop rod retainers at center of double gate openings.

END OF SECTION 02830

SECTION 02930 - SEEDING AND SODDING

PART 1 - WORK INCLUDED

1.01 CLEAN-UP

Upon completion of the Project, the Contractor shall remove all debris and surplus construction materials resulting from his work. The Contractor shall grade the ground along each side of the pipe trenches and/or structures in a uniform and neat manner leaving the construction area in a shape as near as possible to the original ground line, or as shown on the Drawings.

PART 2 - PRODUCTS

2.01 SEED

Grass seed shall be mixed and guaranteed by the supplier to consist of the following:

Annual Rye	60 percent
Kentucky Bluegrass	20 percent
Falcon Fescue	20 percent

2.02 TOPSOIL

Topsoil shall be material stripped and stored under work of Section 02200 and shall be used for all work under this Section. If the quantity of stored topsoil is inadequate or if none has been salvaged from the Project site, the Contractor shall furnish at his own expense sufficient topsoil to properly install all work as specified herein. Topsoil shall be original surface loam obtained from well drained areas from which topsoil has not been removed previously, either by erosion, clearing and removal of tress or mechanical means. It shall not contain subsoil material and shall be clean and free of clay lumps, roots, stones or similar substances more than 2 inches in any dimension, debris, discarded fragments of building materials or weeds and weed seeds.

2.03 SOIL IMPROVEMENTS

A. Commercial fertilizers shall be of analyses specified, or as recommended by the Agricultural Extension Service for treatment of topsoil in the area from which removed, and shall conform to the applicable state fertilizer laws. Fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted.

B. Lime, if recommended for soil treatment by the Agricultural Extension Service, shall be ground limestone (Dolomite) containing not less than 85 percent of total

carbonates, and shall be ground to such a fineness that 50 percent will pass through a 100-mesh sieve, and 90 percent will pass through a 20-mesh sieve. Coarser material shall be acceptable provided that required rates of application are increased proportionally on the basis of quantities passing the 100-mesh sieve.

PART 3 - EXECUTION

3.01 SEEDING AND SODDING

A. After installation of the Project, topsoil shall be spread evenly to a minimum 4-inch depth and lightly compacted. No topsoil shall be spread in a frozen or muddy condition.

1. Any stored topsoil remaining after work is in place shall be disposed of by the Contractor as directed by the Engineer.

B. Soil improvement shall be made if and as recommended by the Agricultural Extension Service prior to seeding.

1. Ground limestone, if required, shall be applied at the recommended rates per square yard and shall be thoroughly mixed into the topsoil.
2. Fertilizers, if required shall be of analysis and rates per square yard as recommended in the topsoil analysis and shall be mixed lightly in the top few inches of topsoil.

C. Immediately before any seed is to be sown, the ground shall be scarified as necessary and shall be raked until the surface is smooth, friable and of a uniformly fine texture. Areas shall be seeded evenly with a mechanical spreader at a rate of 2 pounds per 1,000 square feet, lightly raked and watered with a fine spray.

D. After seed has been distributed, the Contractor shall cover areas that are likely to washout with straw to a depth of 1-1/2 inches.

E. Seeded areas shall be protected and maintained by watering, regular mowing and reseeding as may be necessary to produce a uniform stand of grass. Maintenance shall continue throughout the guarantee period until a dense, uniform turf is established.

F. All paved streets, roads, sidewalks, curbs, fences, stonewalls, lawns, etc., disturbed during construction shall be restored, repaired, or replaced to as good a condition as existed prior to construction. All materials and workmanship shall conform to standard practices and specifications of the Owner and/or the Kentucky Department of Highways, whichever applies.

G. The Contractor shall remove from the site all equipment, unused materials and other items at his expense. The construction site shall be left in a neat, orderly condition, clear of all unsightly items, before the Work is finally accepted.

END OF SECTION 02930

Division 3 – Concrete

SECTION 03310 - STRUCTURAL CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED

The work in this section shall include all formwork, shoring, bracing, anchorage, concrete reinforcement and accessories for cast-in-place concrete.

1.02 GENERAL REQUIREMENT

All concrete construction shall conform to all applicable requirements of ACI 301, ACI 318 and ACI 350 R, except as modified by the supplemental requirements specified herein.

1.03 RELATED WORK

A. Section 02222 - Excavation.

1.04 REFERENCES

A. The Contractor shall obtain and have available in the field office at all times the following references:
   1. Specifications for Structural Concrete for Building ACI 301 (latest revision).
   2. Field Reference Manual: Specifications for Structural Concrete for Buildings ACI Sp-15(88).
   3. Manual of Standard Practice - CRSI (latest revision).
   4. Placing Reinforcing Bars - CRSI (latest revision).
   5. Building Code Requirements for Reinforced Concrete ACI 318.
   6. Environmental Engineering Concrete Structures ACI 350R.

B. The following standard shall also apply to this work:
   1. ASTM C-143.
   2. ASTM C-150.
   3. ASTM C-33.
   4. ASTM C-260.
   5. ASTM C-494.
   6. ASTM A-615.
   7. ASTM D-638.
   8. ASTM D-695.
   9. ASTM D-570.
   10. ASTM D-1252.
   11. ASNI A-116.1.
   12. ASTM A-120.
   13. ASTM C-94.

14. ASTM D-2146.
15. Federal Specifications FF-S-325.

1.05 SUBMITTALS

A. The Contractor shall submit the following data to the Engineer for review:
   1. Proposed mix designs, test results, plotted curves and all other substantiating data as required by Sections 3.8 and 3.9 of ACI 301.
   2. Mix designs for all mixes proposed or required to be used, including all mixes containing admixtures.
   3. A certified copy of the control records of the proposed production facility establishing the standard deviation as defined in Section 3.9 of ACI 301.

B. Certification attesting that admixtures equal or exceeds the physical requirements of ASTM C-494 for Type A admixture and when required, for Type D admixture.

C. Notarized certifications by the manufacturer that epoxy bonding adhesive meets the specification contained herein.

D. Drawings showing locations of all proposed construction joints.

E. Shop drawing for reinforcing steel showing bar schedules, location, and splices.

1.06 QUALITY ASSURANCE

A. Consistency:
   1. Concrete shall be of such consistency that it can be worked readily into all parts of the forms and around embedded work, without permitting the materials to segregate, or free water to collect on the surface. Consistency shall be measured by the ASTM Standard Test Method for Slump of Portland Cement Concrete, Designation C143-78. The consistency of concrete shall be as given in Table I.
   2. Slump tests shall be made in the field by the Contractor, as directed by the Engineer.

B. Compression Tests:
   1. During the progress of the work, at least one set of four compression test cylinders shall be made for each 50 cubic yards of concrete or major fraction thereof, and not less than one such set for each type of concrete for each days' pouring. Cylinders made in the field shall be made and cured in accordance with ASTM Standard Method of Making and Curing Concrete Test Specimens in the Field, Designation C31-69, except that wherever possible molds shall be left on cylinders until they have reached the laboratory.
   2. One (1) cylinder of each set shall be broken in accordance with ASTM C-39 at seven (7) days and two (2) at twenty-eight (28) days. Two (2) copies of these test results shall be submitted to the Engineer on the same day of the tests. The remaining cylinder shall be reserved for future testing if required.

3. On evidence of these tests, any concrete that fails to meet the specified strength requirements shall be strengthened or replaced as directed by the Engineer at the Contractor's expense.

C. Inserts in Concrete by Other Trades:
1. All trades shall be notified, at the proper time, to install items to be embedded in concrete.
2. All castings, inserts, conduits, and other metalwork shall be accurately built into or encased in the concrete by the Contractor as directed and all necessary precautions shall be taken to prevent the metalwork from being displaced or deformed.
3. Anchor bolts shall be set by means of substantial templates.
4. The Contractor shall build into new concrete against which facing brick or tile is to be laid, suitable, acceptable, non-corrodible metal, dovetail grooves for ties for securing the brickwork to the concrete.

D. Testing:
1. All testing shall be in accordance with provisions of ACI 301.
2. Testing services listed in ACI 301 Sections 16.3, 16.4 and 16.5 shall be performed by a testing agency acceptable to the Engineer. Testing services to meet the requirements of ACI shall be paid for by the Contractor at his expense. Test shall be made for each 50 cubic yards of concrete and/or each day concrete is placed.

E. Additional Requirements:
1. Unless otherwise directed by the Engineer, the vertical surfaces of all footings shall be formed. Excavations and reinforcement for all footings shall have been inspected by the Engineer before any concrete is placed.
2. The installation of underground and embedded items shall be inspected before slabs are placed. Pipes and conduits shall be installed below the concrete unless otherwise indicated. Fill required to raise the subgrade shall be placed as specified in Division 2. Unless shown otherwise, porous fill not less than 6 inches in compacted thickness shall be installed under all slabs, tank bottoms, and foundations. The fill shall be leveled and uniformly compacted to a reasonably true and even surface. The surfaces shall be clean, free from frost, ice, mud and water. Where indicated, waterproof paper, polyethylene sheeting of nominal 4-mil minimum thickness, or polyethylene coated burlap shall be laid over surfaces receiving concrete. Structures having pressure relief valves shall have a free draining granular stone layer of not less than 12” directly beneath the base slab.

F. Hot Weather Requirements: Placing of concrete under conditions of high temperatures, low humidity or wind shall be done in accordance with the American Concrete Institute "Hot Weather Concreting" (ACI 305R-77).

G. Cold Weather Requirements: Cold weather concreting procedures and precautions shall conform with American Concrete Institute "Cold Weather Concreting" (ACI 306 R-78).

PART 2 - PRODUCTS

2.01 Contractor shall supply concrete only from an approved ready mixed concrete supplier.

2.02 CONCRETE MIX WITHOUT FLY ASH

Structural concrete required for this project shall be proportioned by Section 3.9 of ACI 301 to produce the following 28-day compressive strengths:

A. Selection of Proportions for Class A Concrete:
1. 4,500 psi compressive for strength at 28 days.
2. Type II cement plus water reducing, dispersing agent and air. Type IP cement may be used in place of Type II.
3. Maximum water/cement plus water reducing dispersing agent ratio = 0.42.
4. Minimum cement content = 564 pounds (6.0 bags)/cubic yards concrete.
5. Nominal maximum size coarse aggregate = No. 67 (3/4-inch maximum) or No. 57 (1-inch maximum).
6. Air content = 6 percent plus or minus 2 percent by volume.
7. Slump = 2 inches to 3 inches in accordance with ASTM C-143.

2.03 OPTIONAL CONCRETE MIX USING FLY ASH

A. Selection of Proportions for Class A Concrete:
1. 4,500 psi compressive for strength at 28 days.
2. Type II cement plus water reducing dispersing agent and air.
3. Maximum (water)/(cement plus water reducing dispersing agent) ratio = 0.42.
4. Minimum cement content = 517 pounds (5.5 bags)/cubic yards concrete.
5. Maximum Fly Ash Content = 71 pounds/cubic yards
6. Nominal maximum size coarse aggregate = No. 67 (3/4-inch maximum) or No. 57 (1-inch maximum).
7. Air content = 6 percent plus or minus 2 percent by volume.
8. Slump = 2 inches to 3 inches in accordance with ASTM C-143.

B. Applicable Standards:
1. ANSI C 311-77 "Standard Methods of Sampling and Testing Fly Ash for Use as an Admixture in Portland Cement Concrete".
2. ANSI C 618-80 "Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete".

C. All concrete work shall use Class A concrete.

D. All testing shall be or have been performed by an approved independent testing laboratory.

E. Cement for exposed concrete shall have a uniform color classification.

F. Type II cement conforming to ASTM C-150 shall be used in all structural concrete. The

alkali content shall not exceed 0.6 percent calculated as sodium oxide. Type IP Cement may be used in place of Type II cement.

G. Coarse aggregate shall conform to all requirements of ASTM C-33.

H. Manufactured sand shall not be used as fine aggregate in concrete.

2.04 FLY ASH CONCRETE

A. In the absence of a verified and acceptable history of fly ash concrete mixes, the following procedure is required to establish the quality of the concrete mix.

B. Trial batches must be made starting thirty (30) days ahead of initial concrete pour. Four (4) mixes shall be designed and produced at no cost to the Owner or the Engineer as follows:
1. Mix using Type II cement with water reducing admixture for normal temperatures (Class A).
2. Mix using Type II cement with water reducing admixture for cold weather temperatures (Class A).
3. Mix using Type II cement with water reducing admixture for hot weather temperatures (Class A).

C. Four (4) test cylinders shall be cast for each of the three (3) mixes. Two (2) cylinders shall be broken at 7 days, and two (2) cylinders shall be broken at 28 days, for each of the three (3) mixes. The trial batch design report shall include strength breaks at 7 days and 28 days, air content, etc.

D. The water-reducing, cement dispersing admixture (such as Master Builders Pozzolith 344-N, Nox-Crete Plastiflow, Plastocrete 161 by SIKA Chemical Company, or approved equal) used in fly ash concrete, shall be a normal, accelerated, or retarded hardening admixture. The admixture shall be used at optimum dosage to offset the slow strength development and setting characteristics of the fly ash. Only those brands of admixture that can provide readily available field service on short notice to provide field services, inspection, and assistance, will be acceptable.

E. Prior to the use of fly ash concrete, recent mill reports shall be submitted on a regular basis during the project. Maximum loss of ignition (LOI) shall be 6 percent.

F. Tests for air content shall be made twice a day at the jobsite prior to pouring, for all mixes containing fly ash.

2.05 ADMIXTURES

A. An air entraining admixture shall be used on all concrete and shall be the neutralized vinsol resin type such as Master Builders MB-VR, or Euclid Chemical Co. AIR-MIX or equal. The admixture shall meet the requirements of ASTM C-260. Certification

attesting to the percent of effective solids and compliance of the material with ASTM C-260 shall be furnished, if requested.

B. A water reducing, set controlling admixture (non-lignin type) shall be used in all concrete. The admixture shall be a combination of polyhydroxylated polymers including catalysts and components to produce the required setting time based on job site conditions, specified early strength development, finishing characteristics required, and surface texture, as determined by the Engineer.

C. Certification shall be furnished attesting that the admixture exceeds the physical requirements of ASTM C-494, Type A, water reducing and normal setting admixture, and when required, for ASTM C-494, Type D, water reducing and retarding admixture when used with local materials with which the subject concrete is composed.

D. The admixture manufacturer, when requested, shall provide a qualified concrete technician employed by the manufacturer to assist in proportioning concrete for optimum use. He also will be available when requested to advise on proper addition of the admixture to the concrete and on adjustment of the concrete mix proportions to meet changing job conditions.

E. The use of admixtures to retard setting of the concrete during hot weather, to accelerate setting during cold weather, and to reduce water content without impairing workability will be permitted if the following conditions are met.

F. The admixture shall conform to ASTM C-494 except that the durability factor for concrete containing the admixture shall be at least 100 percent of control, the water content a maximum of 90 percent of control and length change shall not be greater than control, as defined in ASTM C-494.

G. Where the Contractor finds it impractical to employ fully the recommended procedures for hot weather concreting, the Engineer may at his discretion require the use of a set retardant admixture for mass concrete greater than 2.5 feet thick and for all concrete whenever the temperature at the time concrete is cast exceeds 80 degrees F. The admixture shall be selected by the Contractor subject to the review of the Engineer. The admixture and concrete containing the admixture shall meet all the requirements of these Specifications. Preliminary tests of this concrete shall be required at the Contractor's expense.

H. Admixtures shall be used in concrete design mixes in the same manner and proportions as in the field so that the effects of the admixtures are included in preliminary tests submitted to the Engineer for review prior to the start of construction.

I. When more than one admixture is used, all admixtures shall be compatible. They should preferably be by the same manufacturer.

J. Calcium chlorine will not be permitted as an admixture in any concrete.

2.06 WATER

The water for concrete shall be clean, fresh, and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances. Mix water shall also be potable.

2.07 AGGREGATES

A. Fine aggregates shall be natural sand having clean, hard, uncoated grains, free from injurious amounts of clay, dust, organic matter or other deleterious substances, and shall conform to ASTM C-33.

B. Coarse aggregates shall be crushed stone having clean, hard, uncoated particles, and shall be free from injurious amounts of soft, friable, thin, elongated or laminated pieces. Shale may not be used as aggregate. Coarse aggregates shall conform to ASTM C-33 and shall not exceed the following maximum sizes:
   1. 3/4-inch for slabs, beams, girders, and walls.
   2. 1-inch for all other concrete.

2.08 TESTING AGGREGATES AND DETERMINING PROPORTIONS

A. No concrete shall be used in the work until the materials and mix design have been accepted by the Engineer.

B. The conformity of aggregates to the specifications hereinbefore given shall be demonstrated and determined by tests per ASTM C-33 made with representative samples of the materials to be used on the work.

C. The actual proportions of cement, aggregates, admixtures and water necessary to produce concrete conforming to the requirements set forth shall be determined by making test cylinders using representative samples of the materials to be used in the work. A set of four (4) standard 6-inch cylinders shall be made and cured per ASTM C-31. Two (2) shall be tested at 7 days and two (2) at 28 days per ASTM C-39. The slump shall not be less than the greatest slump expected to be used in the work.

D. Reports on the tests and a statement of the proportions proposed for the concrete mixture, shall be submitted in triplicate to the Engineer for review as soon as possible, but not less than five (5) days prior to the proposed beginning of the concrete work. If the Contractor furnishes in writing, similar, reliable detailed information from an acceptable source, and of date not more than four (4) months prior to the time when concrete will be used on this project, the above requirements for laboratory tests may be modified by the Engineer. Such data shall derive from mixtures containing constituents, including the admixtures where used, of the same types and from the same sources as will be used on this project.

E. The Engineer shall have the right to make check tests of aggregates and concrete, using the same materials, and to order changes as may be necessary to meet the specified

requirements.

F. The Contractor may request permission to add water at the job site, and when the addition of water is permitted by the Engineer, the quantity added shall be the responsibility of the Contractor and in no case shall the total water per bag of cement exceed that determined by the designed mix.

G. All concrete exposed to weather, such as foundations, walls, exterior steps and retaining walls, etc. shall be air entrained.

H. If concrete of the required characteristics is not being produced as the work progresses, the Engineer may order such changes in proportions or materials, or both, as may be necessary to secure concrete of the specified quality. The Contractor shall make such changes at his own expense and no extra compensation will be allowed because of such changes.

2.09 MIXING

All central plant and rolling stock equipment and methods shall conform to the Truck Mixer and Agitator Standards of the Truck Mixer Manufacturers' Bureau of the National Ready Mixed Concrete Assn., as well as the ACI Standards for Measuring, Mixing and Placing Concrete (ACI 614), and with Sections 7 to 14, inclusive, of the ASTM Standard Specification for Ready Mixed Concrete, Designation C94-78a, insofar as applicable.

2.10 WATERSTOPS

See Section 03251 - Expansion and Contraction Joints.

PART 3 - EXECUTION

3.01 PLACING AND COMPACTING CONCRETE

A. At least 24 hours before the Contractor proposes to make any placement of concrete, he shall notify the Engineer of his intention and planned procedure. Unless otherwise permitted, the work shall be so executed that a section begun on any day shall be completed during daylight of the same day.

B. Ready mixed concrete shall be transported to the site in watertight agitator or mixer trucks. The quantity of concrete to be mixed or delivered in any one batch shall not exceed the rated capacity of the mixer or agitator for the respective conditions as stated on the nameplates.

C. Central mixed concrete shall be plant mixed a minimum of 1-1/2 minutes per batch, and then shall be truck mixed or agitated a minimum of 8 minutes. Agitation shall begin immediately after the premixed concrete is placed in the truck and shall continue without interruption until discharge. For transit mixed concrete, the major portion of the mixing water shall be added and mixing started immediately after the truck is charged.

D. The amount of water initially added shall be recorded on the delivery slip for the Engineer's information, no additional water shall be added, either in transit or at the site, except as directed. Mixing (at mixing speed) shall be continued for at least 10 minutes followed by agitation without interruption until discharge. Concrete shall be discharged at the site within 1-1/2 hours after water was first added to the mix, and shall be mixed at least 5 minutes after all water has been added.

E. Concrete that has become compacted or segregated during transportation to or on the site of the work shall be satisfactorily remixed just prior to being placed in the forms.

F. Partially hardened concrete shall not be deposited in the forms. The retempering of concrete that has partially hardened (that is, the remixing of concrete with or without additional cement, aggregate, or water) will not be permitted.

G. The concrete shall be mixed only in the quantity required for immediate use. Concrete that has developed an initial set shall not be used. The Contractor shall have sufficient plant capacity and transporting apparatus to insure continuous delivery at the rate required.

H. The temperature of the concrete mixture immediately before placement shall be between 50 degrees F and 90 degrees F.

I. Concrete mixed in stationary mixers and transported by non-agitating equipment shall be placed in the forms within 45 minutes from the time ingredients are charged into the mixing drum. Concrete that is truck mixed or transported in truck mixers or truck agitators shall be delivered to the site of the work and discharge completed in the forms

within the time specified in paragraph 10.7 of ASTM C-94, except that when the concrete temperature exceeds 85 degrees F, the time shall be reduced to 30 minutes. Transmit mixed concrete that is completely mixed at the site of concrete placement or batched cement and aggregates transported to mixers shall be placed in the forms within 1-1/2 hours after cement has been added. Concrete shall be placed in the forms within 15 minutes after discharge from the mixer at the job site.

J. If concrete is placed by pumping, no aluminum shall be used in any parts of the pumping system that contact or might contaminate the concrete. Aluminum chutes and conveyors shall not be used.

K. No concrete shall be placed on frozen subgrade or in water, or until the subgrade, forms, and preliminary work have been accepted. No concrete shall be placed until all materials to be built into the concrete have been set and have been accepted by the various trades and by the Engineer. All such materials shall be thoroughly clean and free from rust, scale, oil, or any other foreign matter.

L. Forms and excavations shall be free from water and all dirt, debris, and foreign matter when concrete is placed. Except as otherwise directed, wood forms and embedded wood called for or allowed shall be thoroughly wetted just prior to placement of concrete.

M. Concrete placed at air temperatures below 40 degrees F shall have a minimum temperature of 50 degrees F and a maximum of 70 degrees F when placed.

N. Chutes for conveying concrete shall be metal or metal lined and of such size, design, and slope as to ensure a continuous flow of concrete without segregation. The slope of chutes shall have approximately the same slope. The discharge end of the chute shall be provided with a baffle, or if required, a spout and the end of the chute. The spout shall be kept as close as practicable to, but in no event more than 5 feet above the surface of the fresh concrete. When the operation is intermittent, the chute shall discharge into a hopper.

O. In thin sections of considerable height (such as walls and columns), concrete shall be placed in such manner as will prevent segregation and accumulations of hardened concrete on the forms or reinforcement above the mass of concrete being placed. To achieve this end, suitable hoppers spouts with restricted outlets, etc. shall be used as required or permitted unless the forms are provided with suitable openings.

P. Chutes, hoppers, spouts, etc. shall be thoroughly cleaned before and after each run and the water and debris shall not be discharged inside the form.

Q. For any one placement, concrete shall be deposited continuously in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams and planes of weakness within the section, and so as to maintain until the completion of the unit, an approximately horizontal plastic surface.

R. No wooden spreaders shall be left in the concrete.

S. During and immediately after being deposited, concrete shall be thoroughly compacted by means of suitable tools and methods, such as internal type mechanical vibrators operating at not less than 5,000 rpm. or other tool spading to produce the required density and quality of finish. Vibration shall be done only by experienced operators and shall be carried in such manner and only long enough to produce homogeneity and optimum consolidation without permitting segregation of the solid constituents, "pumping" of air, or other objectionable results.

T. The concrete shall be thoroughly rodded and tamped about embedded materials so as to secure proper adhesion and prevent leakage. Care shall be taken to prevent the displacement of such materials during concreting.

U. The distance between construction joints shall not exceed 25 feet for all concrete construction and not less than 48 hours shall elapse between casting of adjoining units unless these requirements are waived by the Engineer. Provision shall be made for jointing successive units as indicated or required. Where joints are not shown on the Drawings, they are required to be made at a spacing of approximately 25 feet. Additional construction joints required to satisfy the 25 foot spacing requirement shall be located by the Contractor subject to the review of the Engineer. The Contractor shall submit for review Drawings separate from the steel reinforcing Drawings, showing the location of all proposed construction joints. All construction joints shall be prepared for bonding as specified in paragraph 6.1.4.3 of ACI Standard 301 and Section 3.02 Bonding Concrete at Construction Joints. Joints in walls and columns shall be maintained level.

V. Formwork for beam soffits and slabs and other parts that support the weight of concrete shall remain in place until the concrete has reached its specified 28-day strength, unless otherwise specified or permitted.

3.02 BONDING CONCRETE AT CONSTRUCTION JOINTS

A. In order to secure full bond at construction joints, the surface of the concrete previously placed (including vertical, inclined, and substantially horizontal areas) shall be thoroughly cleaned of foreign materials and laitance, if any, and then roughened.

B. The previously placed concrete at the joint shall be free of standing water.

C. Waterstops shall be used on all construction joints below water level and as otherwise indicated on the drawings.

3.03 CURING AND PROTECTION

A. All concrete, particularly slabs and including finished surfaces, shall be treated immediately after concreting or cement finishing is completed, to provide continuous moist curing for at least seven days, regardless of the adjacent air temperature. Walls and vertical surfaces may be covered with continuously saturated burlap, or kept moist by other acceptable means. Horizontal surfaces, slabs, etc., shall be ponded to a depth of 1/2-inch wherever practicable, or kept continuously wet by the use of lawn sprinklers, a complete covering of continuously saturated burlap, or by other acceptable means.

B. For at least seven days after having been placed, all concrete shall be so protected that the temperature at the surface will not fall below 45 degrees F. The methods of protecting the concrete shall be as specified in that section of the General Specifications titled "Precautions During Adverse Weather" and shall be subject to the review of the Engineer.

C. No manure, salt, or other chemicals shall be used for protection.

D. The above mentioned 7-day periods may be reduced to 3 days in each case if high-early-strength cement is allowed to be used in the concrete.

E. Wherever practicable, finished slabs shall be protected from the direct rays of the sun to prevent checking and crazing.

3.04 TRIMMING AND REPAIRS

A. The Contractor shall use suitable forms, mixture of concrete, and workmanship so that concrete surfaces, when exposed, will not require patching. Concrete which, in the opinion of the Engineer has excessive honeycomb, aggregate pockets, or depressions will be rejected and the Contractor shall, at his own expense remove the entire section containing such defects and replace it with acceptable concrete.

B. As soon as the forms have been stripped and the concrete surfaces exposed, fins and other projections shall be removed, recesses left by the removal of form ties shall be filled and surface defects which do not impair structural strength shall be repaired.

C. Defective concrete shall be cut perpendicular to the surface until sound concrete is reached, but not less than 1-inch deep. The remaining concrete shall be thoroughly roughened and cleaned. Concrete around the cavity or the form tie recess shall be thoroughly wetted and promptly painted with a 1/16-inch brush coat of neat cement mixed to the consistency of thick paint. The hole shall then be filled with mortar.

D. Mortar shall be 1:1-1/2 cement and sand mix with sufficient white cement, or fine limestone screening in lieu of sand, to produce a surface matching the adjoining work. Cement and sand shall be from the same sources as in the parent concrete.

E. Mortar in patches shall be applied so that after partial set it can be compressed and rubbed

to produce a finish flush and uniform in texture with the adjoining work. All patches shall be warm-moist cured as above specified.

F. The use of mortar patching as above specified shall be confined to the repair of small defects in relatively green concrete. If substantial repairs are required, the defective portions shall be cut out to sound concrete and the defective concrete replaced by means of a cement gun, or the structure shall be taken down and rebuilt, all as the Engineer may decide or direct.

3.05 FINISHES

A. Exposed to View Concrete Surfaces:
1. All concrete exposed to view in the completed structure shall be produced using materials and workmanship to such quality that only nominal finishing will be required. The provisions of paragraphs 13.3, 13.4, and 13.6 of ACI shall apply to all exposed to view concrete surfaces (limited to 1 foot below grade and 1 foot below the minimum liquid level for structures that will contain liquids).
2. Forms for exposed concrete surfaces shall be exterior grade, high density overlay plywood, steel, or wood forms with smooth tempered hard board form liners.
3. Forms shall be coated with Nox-Crete Form Coating Release Agent, Debond Form Coating by L & M Construction Chemicals, Inc. or an approved equal, before initial pour and between subsequent pours, in accordance with the manufacturer's printed instructions. Form boards shall not be wet with water prior to placing concrete.
4. Recessed joints in concrete shall be formed using lacquer coated wooden battens or forms, milled to indicated profiles. Battens and corner strips shall be carefully inspected before concrete is placed and damaged pieces replaced.
5. Chamfer strips shall be 1-inch radius with leg, polyvinyl chloride strips by Gateway Building Products, Saf-T-Grip Specialties Cor., Vinylex Corp., or equal.
6. Particular attention is directed to the requirements of paragraphs 10.2.2 and 13.3 of ACI 301. Form panels shall be provided in the maximum form joints. Wherever practicable, form joints shall occur at recessed joints. All form joints in exterior exposed to view surfaces shall be carefully caulked with an approved nonstaining caulking compound. Joints shall not be taped. Form oil or other material which will impart a stain to the concrete shall not be allowed to contact concrete surfaces.
7. Care shall be taken to prevent chipping of corners or other damage to concrete when forms are removed. Exposed corners and other surfaces which may be damaged by ensuing operations shall be protected from damage by boxing, corner boards or other approved means until construction is completed.
8. Form ties shall remain in the walls and shall be equipped with a waterseal to prevent passage of water through the walls. Particular care shall be taken to bend tie wire ends away from exposed faces of beams, slabs and columns. In no case shall ends to tie wires project toward or touch formwork. Minimum set back of form ties shall be 1 inch from faces of wall. The hole left by removal of tie ends shall be sealed and grouted as per ACI Par. 9.3 and in accordance with procedure described hereinafter in Par. 3.04.E. Form ties will be permitted to fall within as

cast areas of architecturally treated wall surfaces (ACI Chapter 13); this does not apply to walls receiving textured decorative waterproof masonry coating.

9. All formed exposed to view concrete shall be prepared as paragraph 3.04 B, then receive a grout-cleaned finish. The grout-cleaned finish shall use a mix of one part white Portland cement and 1½ parts of fine sand mixed with sufficient water to form a grout having the consistency of thick paint. Apply to damp surface and rub down in such a manner as to obtain a smooth, filled surface uniform in color and free from defects and blemishes. Exterior vertical surfaces shall be finished to one foot below grade. Interior exposed to view vertical surfaces of dry pits shall be finished full height, interior vertical surfaces of liquid containers shall be finished to one foot below the minimum liquid level that will occur during normal operations.
10. Slope all slabs to prevent water pocketing.

B. All vertical surfaces below minimum liquid level in liquid containing structures shall have a smooth form finish.

C. All smooth form concrete vertical surfaces shall be true plane within 1/4-inch in 10 feet as determined by a 10 foot straight edge place anywhere on the surface in any direction. Abrupt irregularities shall not exceed 1/8-inch.

D. Basin, flume, conduit and tank floors shall have a "troweled" finish unless shown otherwise on Drawings.

E. Weirs and overflow surfaces shall be given a troweled finish.

F. Exterior platforms, steps and landings shall be given a broom finish. Broom finish shall be applied to surfaces which have been steel troweled to an even smooth finish. The troweled surface shall then be broomed with a fiber bristle brush in the direction transverse to that of the main traffic.

G. Walking surfaces of slabs shall have a troweled finish unless shown otherwise on Drawings.

H. Patching of holes due to removal of tie ends and other repairable defective areas shall be as follows: Entire contact area of hole shall be coated with two part moisture insensitive epoxy bonding compound in accordance with manufacturer's specifications, and prior to placing of freshly mixed patching mortar. Patching mortar shall be mixed and placed in general accordance with ACI Par. 9.2.2, 9.2.3, and 13.6.

I. Nox-Crete Harbeton, Chem Hard by L & M Construction Chemicals hardener treatment, or an approved equal shall be applied to all exposed concrete floors in occupied spaces. The floors shall be thoroughly cured, cleaned, and perfectly dry with all work above them completed. The hardener shall be applied evenly and freely and in conformance with manufacturer's instructions, using not less than three (3) coats, allowing 24 hours between coats. One gallon of hardener shall cover not more than 100 square feet. After the final

coat is completed and dry, surplus hardener shall be removed from the surface of the concrete by scrubbing and mopping with water.

3.06 CONCRETE WALKS AND CURBS:

A. Subgrade shall be true and well compacted at the required grades. Spongy and otherwise unsuitable material shall have been removed and replaced with properly compacted, approved material. Concrete walks shall be placed upon 8-inch DGA unless noted otherwise on the Drawings.

B. Concrete walks shall be not less than 4 inches in thickness. Walks shall have contraction joints every 5 linear feet in each direction, formed in the fresh concrete by cutting a groove in the top surface of the slab to a depth of at least one-fourth the slab thickness with a jointing tool. Transverse expansion joints shall be installed at driveways, and opposite expansion joints in adjacent curbs. Where curbs are not adjacent, transverse expansion joints shall be installed at intervals of approximately 25 feet. Sidewalks shall receive a broomed finish. Scoring shall be in a transverse direction. Edges of the sidewalks and joints shall be edged with a tool having a radius not greater than 1/6-inch. Sidewalks adjacent to curbs shall have a slope of 1/4-inch per foot toward the curb. Sidewalks not adjacent to curbs shall have a transverse slope of 1/4-inch per foot or shall be crowned as directed by the Engineer. The surface of the concrete shall show no variation in cross section in excess of 1/4-inch in 5 feet. Concrete walks shall be reinforced with 6 x 6 - W1.4 x W1.4 welded wire fabric unless noted otherwise on the Drawings.

C. Concrete curbs shall be constructed to the section indicated on the Drawings, and all horizontal and vertical curves shall be incorporated as indicated or required. Forms shall be steel or as approved by the Engineer. At the option of the Contractor, the curbs may be precast or cast-in-place. Cast-in-place curbs shall be divided into Sections 8 to 10 feet in length using steel divider plates. The divider plates shall extend through the concrete and shall be removed. Precast curbs shall be finished smooth. Dividers shall be installed where the curb crosses pipe trenches or other insecure area. Transverse expansion joints shall be installed at all curb returns and at intervals of approximately 40 feet.

3.07 WATERTIGHTNESS

A. The structures which are intended to contain liquids and/or will be subjected to exterior hydrostatic pressures shall be so constructed that when completed and tested, there shall be no loss of water and no wet spots shall show.

B. As soon as practicable after the completion of the structures, the Contractor shall fill such structures with water and if leakages develop or wet spots show, the Contractor shall empty such structures and correct the leakage in an approved manner. Any cracks which appear in the concrete shall be dug out and suitably repaired. Temporary bulkheads over pipe openings in walls shall be provided as required for the testing.

C. After repairs, if any are required, the structures shall be tested again and further repaired if necessary until satisfactory results are obtained. All work in connection with these tests and repairs shall be at the expense of the Contractor.

D. Waterstops shall be placed in all locations as indicated on the Drawings and as may be required to assure the watertightness of all containers of liquids. Special shop fabricated ells, tees and crosses shall be provided at junctions. Waterstops shall be extended at least 6 inches beyond end of placement in order to provide splice length for subsequent placement. In slabs and tank bottoms, waterstops shall be turned up to be made continuous with waterstops at bottom of walls or in walls. All joints between adjacent, continuing, and intersecting sections of waterstop including butt joints, tee joints, and other angled joints shall be heat fused to form a watertight seal. Waterstops shall not be lapped. Waterstops shall be secured in place to maintain proper position during placement of concrete. Care shall be taken to avoid folding while concrete is being placed and to prevent voids in the concrete surrounding the waterstop. All materials shall be installed in accordance with the manufacturer's recommendations.

E. Joints between pipe (except cast iron wall pipe) and cast-in-place concrete walls shall be sealed as required by the Drawings.

F. The top surface of all concrete decks (except slabs on grade) shall be coated with Sikagard-70 water-repellant penetrating sealer as manufactured by the Sika Corporation, Nox-Crete Stifel, or another approved equal. The manufacturer's recommendations shall be followed in all areas of application.

3.08 GROUTING BASE PLATES, BEARING PLATES AND MACHINE BASES

A. Column base plates, bearing plates for beams and similar structural members, machinery and equipment bases shall, after being plumbed and properly positioned, be provided with full bearing on epoxy nonshrink grout. Concrete surfaces shall be rough, clean, free of oil, grease and laitance and shall be moistened thoroughly immediately before grout is placed. Metal surfaces shall be clean and free of oil, grease and rust. Mixing and placing shall be in conformance with the material manufacturer's printed instructions.

B. Grout fill that is formed in place by using rotating equipment as a screed, such as for clarifiers and similar types of equipment, shall be mixed in proportions and consistencies as required by the manufacturer or supplier of the equipment.

3.09 EQUIPMENT PADS

Unless otherwise shown or directed, all equipment and items such as lockers, motor control centers, etc., shall be installed on concrete bases. The bases shall be constructed to the dimensions shown on the Drawings or as required to meet plan elevations. Where no specific plan elevations are required, the bases shall be 6 inches thick and shall extend 3 inches outside the equipment base. In general, the concrete bases shall be placed up to 1-inch below the base. The equipment shall then be properly shimmed to grade and the 1-

inch void filled with nonshrink epoxy grout.

END OF SECTION 03310

SECTION 03600 - PRECISION GROUTING

PART 1 - GENERAL

1.01 WORK INCLUDED

Provide all labor, material, equipment and services required for grouting of equipment, machinery, structural steel, handrails, anchor bolts and other items or work for which grouting is specified or required. All unnecessary holes, openings and cracks in existing concrete shall be filled and patched.

1.02 DESCRIPTION OF WORK

A. High strength, precision support of machine bases and soleplates, setting anchor bolts, including equipment subject to thermal movement and repetitive dynamic loading.

B. Work includes providing a non-shrink, ready-to-use, fluid precision epoxy grout material; proportioned, pre-mixed and packaged at the factory; delivered to the job site to place with only the addition of water; forming, placing and curing as specified in this section.

1.03 RELATED WORK

A. Section 03310 - Structural Concrete.

B. Review all divisions and sections for equipment, machinery and other items to be grouted.

1.04 QUALITY ASSURANCE

Comply with the following codes, standards, test and recommended practices for foundation concrete as apply to precision grouting:

A. ACI 347 "Recommended Practice for Concrete Formwork".

B. ASTM C 309 "Standard Specifications for Liquid Membrane Forming Compounds for Curing Concrete".

C. Manufacturer's Information on Use of Grout: Attached to each bag of grout.

1.05 SUBMITTALS

A. Manufacturer's data of grout to be used shall be submitted to Engineer for review (see Section 01300).

PART 2 - PRODUCTS

2.01 GROUT

A. Precision-support grout shall consist of an epoxy three component system, special graded and processed (non-ferrous metallic internal reinforcing aggregate), carefully graded natural fine aggregate and additional technical components.

B. Grouts which depend upon aluminum powders, chemicals, or other agents which produce gas for expansion are not acceptable.

C. Precision-support grout shall also meet the following requirements:
1. Free of gas producing agents.
2. Free of oxidizing catalysts.
3. Free of inorganic accelerators, including chlorides.

2.02 WATER

Water shall be suitable for drinking.

PART 3 - EXECUTION

3.01 PREPARATION FOR GROUTING

A. Remove laitance down to sound concrete.

B. Surface to receive grout shall be rough and reasonably level.

C. Surface shall be properly cured. DO NOT USE CURING COMPOUNDS.

D. Clean surface of oil, grease, dirt, and loose particles.

E. Clean bolt holes, bolts and underside of equipment base.

F. Install per manufacturer's recommendations.

3.02 FORMWORK

A. Formwork shall be compatible with proposed method of placing grout. Design for rapid, continuous and complete filling of space to be grouted.

B. Build strong, tight forms braced so they will not leak or buckle under weight of fluid grout.

3.03 FINISHING AND CURING

A. Follow manufacturer's printed instructions for the brand and type of grout being used.

B. The grout shall meet the following strengths:

	Plastic Mix	**Flowable Mix**
1 day	4,000 psi	2,000 psi
3 days	6,000 psi	3,000 psi
7 days	8,000 psi	5,000 psi
28 days	10,000 psi	7,000 psi

END OF SECTION 03600

Division 16 – Electrical

SECTION 16000 - ELECTRICAL WORK

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Instruction for Bidders, General Conditions, Supplemental Conditions, Division 1 of the Specifications and all Contract Documents shall apply and govern the Work of all sections in this Division regardless of how the Work may be apportioned to various trades or subcontractors.

B. The Contractor shall furnish all labor and materials to install a power and control system as shown on the Contract Drawings and specified herein.

1.02 GENERAL

A. All materials and equipment installed shall be new and unused and shall be of the latest design of manufacturers regularly engaged in the manufacture of such products that conform with the requirements of the Contract Drawings and Specifications.

B. These Specifications, the associated Drawings, and other Contract Documents have been prepared with intention of their yielding, through construction, electrical installations that are fully operable, safe, complete and in full compliance with the latest editions of the National Electrical Code, local codes and ordinances, and any other authority having jurisdiction over the Work. The omission of miscellaneous electrical items or accessories not specifically called for in these Contract Documents which would detract from this intention shall not relieve the Contractor of the responsibility of furnishing and installing these items and accessories.

1.03 SUBMITTALS

Shop drawings, clearly marked to show only items applicable to this specific contract, shall be submitted for review and shall include complete sizing of components and control schematics.

1.04 GUARANTEE

The Contractor shall refer to the article on guarantees and warranties in the general conditions and special conditions to determine the extent of his guarantee periods.

1.05 DIMENSION VERIFICATION AND DOCUMENTATION

Scale dimensions as shown on the Drawings shall be considered as approximate. The Contractor shall be responsible for making field verifications. Specific attention shall be given to the exact location of any underground lines installed under this Contract. These

lines shall be dimensioned to easily identifiable points on permanent building structures for location and elevation and these dimensions shall be entered and shown on the Record Drawings.

1.06 CODES AND STANDARDS

All electrical equipment and details of installations shall comply with the requirements of the latest editions of the National Electrical Code (NFPA-70), the National Electrical Safety Code (ANSI C2), OSHA and all applicable codes.

1.07 APPROVAL AND MARKING OF EQUIPMENT

Electrical devices and materials shall be listed and/or labeled by the Underwriters' Laboratories, Inc.

1.08 EQUIPMENT SPECIFIED ELSEWHERE

Certain items of control and other equipment are indicated on the electrical drawings for connection, but are specified in other sections of these Documents. Such items are not furnished as part of the electrical work.

1.09 PROTECTION OF ELECTRICAL EQUIPMENT

Electrical equipment shall be protected from the weather, especially from water dripping or splashing upon it, at all times during shipment, storage, and construction. Equipment shall not be stored outdoors even if its enclosure is rated as weatherproof, watertight, etc. Where equipment is installed or stored in moist areas, such as unheated building, etc., it shall be provided with an acceptable means of preventing moisture damage such as a uniformly distributed source of heat to prevent condensation.

1.10 DEFECTIVE OR DAMAGED EQUIPMENT

A. Should it be determined by the Contractor, Owner or Engineer that any equipment or material has been subjected to possible damage by water, it shall be thoroughly dried and put through a dielectric test as directed by the manufacturer, at the expense of the Contractor or shall be replaced by the Contractor without change in contract price. Any equipment found to be marginal or that fails to meet manufacturer's standards shall be replaced at no additional charge to the Owner or Engineer.

B. Any equipment damaged during shipment, while stored, or during construction shall be replaced at the Contractor's expense. Minor scratches on equipment cabinets, etc., may be repaired on site. Any current carrying parts, switch blades, operators, coils, contacts, etc., which are damaged, shall be replaced at no cost to the Owner or Engineer.

1.11 PERMITS AND APPROVALS

A. The Contractor shall obtain all permits necessary. The Contractor shall furnish inspection by an agency licensed or otherwise qualified to perform electrical inspections in the Commonwealth of Kentucky.

B. The Contractor shall notify the electrical inspector, in writing, immediately upon the start of the Work and a copy of the notice shall be sent to the Engineer.

C. All costs incidental to the electrical inspection shall be borne by the Contractor.

D. The Contractor shall furnish certificates of final approval by the electrical inspector and final payment will be withheld until he has presented the Engineer with the aforementioned certificate of approval.

1.12 CIRCUIT LOADS

The Contractor shall verify the total load to be placed on the circuits as well as voltage, phase, frequency and connections required for equipment before rough-in, and if they differ from the Drawings and Specifications, he shall contact the Engineer immediately for further instructions before the Work commences.

1.13 ELECTRICAL SERVICE

A. The Contractor shall obtain and install a complete electrical service with new service equipment. The new equipment connections and conduit shall be sized for the application and the service shall meet the requirements of the National Electrical Code (NEC) and the local utility company.

B. The Contractor shall make all necessary arrangements for transfer of power by the local utility company.

PART 2 - PRODUCTS

2.01 CONDUIT

A. No conduit smaller than 3/4-inch shall be used.

B. Rigid Conduit: Rigid conduit shall be standard weight, mild steel pipe. The conduit shall receive a protective zinc coating both inside and outside by means of hot-dip galvanizing. Threads shall not have any coating which will reduce the conductivity of the joint. Coupling, bends, elbows, fittings, etc., shall be subject to the same requirements as for the straight lengths. All conduit and fittings shall be UL approved. Rigid conduit shall be delivered with plastic protectors on the threads.

C. Electrical Metallic Tubing (EMT): No EMT will be allowed on this project.

D. Liquid tight flexible metallic conduit shall be constructed of flexible or spirally wound galvanized steel enclosed in light gray colored PVC outer jacket. Liquid tight flexible metallic conduit shall be equal to American Brass "Sealtite" Type UA. Connectors shall be equal to Midwest Type LT.

E. Plastic conduit shall be schedule 40, PVC, rated for use with 90 degrees celsius conductors and for use in direct sunlight, with chemical weld joints. This Contractor shall provide all fittings, adapters, etc., required for a complete installation as shown on the Drawings.

2.02 WIRE AND CABLE

A. All conductors shall be insulated so that they are rated at 600 volts, (except float switch cable may be 300 volt rated).

B. No conductors smaller that AWG No. 12 shall be used except for signal or control systems, or where otherwise indicated.

C. All conductors shall be soft drawn, 98 percent conductivity copper conforming to the latest ASTM Specifications and the requirements of the National Electrical Code.

D. Single conductors shall be insulated with THW insulation and all conduits shown on the Drawings are sized accordingly. At the Contractor's option, THWN insulation may be substituted.

E. Cable used for the pump motor power and for the float switches is to be provided with that device. Refer to the pump and float switch Specification section.

2.03 CONTROL PANELS

A. Refer to Section 02733 – SEWAGE PUMP STATION for control panel information.

2.04 GROUNDING

A. The resistance value of the main grounding conductor measured between the main switchgear and a good earth ground shall not exceed five (5) ohms.

B. Ground Rods: Ground Rods shall be the copper clad steel type and shall be a minimum of 10 feet in length, 3/4-inch in diameter. Ground rods shall be equal to those as manufactured by Copperweld Steel Company.

C. Grounding electrode conductors shall be bare copper. Equipment grounding conductor shall be copper, THW insulated, green (or green with yellow tracer) in color, and rated at 600 volts.

D. Ground clamps for use on metallic pipes shall be of copper, brass or silicon bronze with a

rigid metal base providing good contact by proper seating on the pipe. Strap type clamps shall not be used.

2.05 CONTROL PANEL COMPONENTS

A. Duplex Receptacle: Duplex receptacle shall be NEMA 5-20R, 120-volt, 20 ampere, equal to Pass and Seymour Catalog No. 2091-SHG, GFI.

B. Circuit Breakers: All circuit breakers shall be molded case breakers and of the size as shown on the Drawings. Multiple-pole breakers shall be factory assembled in one molded case. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole. Single-pole breakers and circuit breakers for motors shall be equal to Square-D, Type FAL. The main breaker shall be equal to Square-D, Type FHL.

C. Pushbuttons: Pushbutton controls shall be non-illuminated, momentary contact (unless otherwise shown in the schematics), oil tight, fully guarded Square D, Class 9001, or equal. Pushbuttons shall have a means of installing a metal plate to designate the function.

D. Selector Switches: Selector switch operators shall be non-illuminated, oil tight, number of positions as shown in the schematics, for use as maintained contact as shown, Square D, Class 9001, Type K or equal.

E. Pilot Lights: Pilot lights shall be rated at the indicated control voltage, press-to-test, incandescent, with lens color as shown on the schematics. Pilot lights shall be Square D, Class 9001, Type K or equal.

F. Alternator: The alternator shall alternate pumps on successive pumping and provide for energizing the second pump as back-up or lag pump. The alternator shall be electric, NEMA rated A600 equal to Furnas Class 47.

G. Contact Blocks: Switch contact blocks shall be gangable, reversible, completely compatible with the necessary operator, double-break silver contacts with a flexible, movable contact blade providing a scrubbing action with positive wipe. Contacts shall be rated at the indicated control voltage, 10 amperes continuous, Square-D Class 9001, Type K or equal.

H. Control Relays: Auxiliary control relays shall be magnetic, general purpose, "ice cube", type with 2-pole, double throw contacts rated at 5 amperes (minimum), 120 volts (minimum). Coils shall be rated to operate at the indicated control voltage. Relays shall be equal to Square-D, Class 8501, Type K. Provide proper bases, mounting track, etc. for a complete installation. Bases shall be equal to Square-D, Type NR and all relays shall be fitted with a retainer clip. Relays shall have a manual operator and pilot light.

I. Time Relays: Time relays shall be off-delay or on-delay as shown on the Drawings, shall

be field adjustable between the limits indicated in the schematics, solid state type and shall operate at the indicated control voltage. Where indicated, timed relays shall have instantaneous operating contacts as well as timed contacts.

J. Legend Plates: Legend plates shall be of the metal ring type which installs around the control device under the ring unit. Lettering shall be factory finished to denote the function of each control device. Where protective caps are used, legend plates shall be rectangular, separately mounted, factory finish type.

K. Control Voltage: Control circuitry voltage shall be 120 volts and all control devices shall be rated to operate at this voltage. Certain control devices may be provided under other Divisions of the Specifications, but wired under this Section. The Contractor shall verify that all devices falling into this category are rated for the specified control voltage prior to installation.

L. Elapsed Time Meter: The elapsed time meter shall be equipped with 120-volt, 60 Hertz, permanent magnet motor that are plus or minus 50 milli-seconds per start or stop and 100 percent when running at normal frequency. The counter wheels shall be gear and pinion type, 1-inch in diameter and have easy-to-read numbers. The elapsed time meter shall be non-resettable, capable of registering elapsed time up to 99,999.9 hours as manufactured by Cramer, or equal.

M. Blocks: Terminal blocks and power distribution blocks shall be provided as required. Each block shall be sized appropriately for the size and number of wires being terminated. Blocks shall be as manufactured by Square-D, Class 9080, or equal.

N. Surge Suppressors: Surge suppressors shall be installed parallel to all motor starters. They shall provide protection against lightning and other high voltage surges on an AC line-to-ground system. The protectors shall be Square-D, Class 6673, or equal.

2.06 SAFETY SWITCHES

Safety switches shall be heavy-duty, load break type with a quick-make, quick-break, switch mechanism, in a NEMA 4X enclosure. Ampere rating and number of poles shall be as noted on the Drawings. Padlocking capability shall be provided for locking the switch either in the closed (on) position or open (off) position. Fuse clips shall be rejection type. Switches shall be provided with a cover-blade interlock so that the cover cannot be opened when the switch blades are closed, nor can the switch blades be closed with the cover open. Interlock bypassing devices shall be included for use by authorized personnel. Switches shall be Square-D, Class 3110, or equal.

2.07 FUSES

The Contractor shall provide fuses as called for on the Drawings. Where the fuse size is not indicated, the Contractor shall size the fuse for actual load installed. Where the fuse size is indicated on the Drawings, the Contractor shall verify the actual load installed and

provide fusing accordingly. Unless otherwise indicated on the Drawings, all fuses shall be non-renewable, current limiting, dual element, time-lag type. The fuses shall have an interrupting capacity of at least 100,000 amperes RMS symmetrical. Fuses shall be as manufactured by Bussman or equal.

2.08 SERVICE POLE

The service pole(s) (where shown) shall be southern pine, pressure creosote treated, roofed and gained before treatment and of the length and class as shown on the Drawings. Pole hardware shall be galvanized steel.

2.09 ALARM LIGHT

The Contractor shall provide an alarm light mounted on top of the control panel. The light shall be flashing strobe with lexan dome, 120-volt, red lens. The light shall be Edwards "Adaptabeacon", Catalog No. 94 or equal.

2.10 FLOAT SWITCHES

Float level switches shall be of the tank float switch type and shall produce a contact closure upon rising water level. The float shall be polypropylene, minimum 2-7/8 inch diameter, with mercury tilt type normally open contacts. Contacts shall be rated at 10 amp, 120-volt. Switches shall be complete with Type SO cable, 316 stainless steel clamp, bracket, U-bolts, and 1 inch NPT pipe mounted inside the wet well. Float switches shall be Conery, Model 2900, or equal.

2.11 SPARE PARTS

A. Spare parts for this project shall include the following:

Item	Quantity
Pushbuttons	1
Selector Switches (3-position)	1
Pilot Lights	2
Control Relay	1
Time Relay	1
Elapsed Time Meter	1

Surge Suppressor	1
Float Switch	1

B. For consumable parts such as light bulbs and fuses, 100 percent spare bulbs and fuses shall be provided.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Excavation, Backfilling and Grading:

1. The Contractor shall perform all earth and rock excavation, backfilling and grading required for this part of the work. Rock excavation shall be made to a depth of 4 inches below pipe and filled to subgrade with dense graded aggregate limestone. After the bid is submitted there will be no additional funds forthcoming for excavation work on this project. All excavation shall be bid as unclassified.
2. Trenches shall be maintained free of water until backfilling is completed.
3. Backfilling material in earth excavation shall be clean earth to a line at least 12 inches above the top of the conduit. From this line upward, rock not more than 6 inches in diameter may be used provided it is spaced at least 12 inches apart. Filling between rock shall be of clean earth, thoroughly tamped in 6 inch layers to the finished grade. All surplus rock and earth shall be removed from the site as directed by the Engineer.
4. Depth of bury for all conduit shall be a minimum of 24 inches below finished grade.

B. Conduit:

1. Rigid steel conduit shall be used for emergence from underground, or from below slab-on-grade and where exposed. Schedule 40 PVC shall be used underground. Adapters shall be used and rigid steel extended above grade from PVC that is installed underground or below slab-on-grade. PVC shall be concrete encased where it passes under roadways. PVC shall not be used where exposed on the exterior nor where exposed to direct sunlight. Conduit shall be installed so as to insure against trouble from the collection of trapped condensation. This Contractor shall plan his work so that runs of conduit miss equipment by other trades. Conduit bushing shall have insulating material which has been permanently fastened to the fittings. Bushings for conduit 1-1/2 inches trade size and larger shall be complete with grounding lug and shall be bonded to the box by means of bare copper wire. All field bends shall be made with standard tools and bending equipment manufactured especially for this purpose. Bends in metallic conduit shall be made while cold and in no case shall the conduits be heated. Conduits shall not be bent

through more than 90 degrees. Size of conduits shall not be less than that required by the National Electrical Code. The Contractor shall install larger size conduits than detailed where there is more than 100 feet of unbroken run or where the total of the angles through which the conduit has been bent during a single run exceeds 270 degrees.

2. All conduit installed on concrete surfaces shall be anchored with spacer type conduit clamps preventing contact between the conduit and the concrete surface. Conduits penetrating walls shall be grouted in place to form a seal.
3. All conduit shall be run continuous between devices with a minimum number of bends. Back-to-back 90 degree bends (180 degree change of direction) will not be acceptable. During construction, all new conduits shall be kept dry and free of moisture and debris. Before the wire is pulled in, all conduits shall be swabbed to clear all moisture and debris which may have unavoidably accumulated.

C. Wire and Cable:

1. Direct Burial Cable: No cable buried directly in the earth, not in raceway will be allowed on this project.
2. Wire shall not be installed until all work of any nature that may cause injury to the wire is completed. Mechanical means shall not be used in pulling in wires No. 8 or smaller. Approved wire pulling lubricant shall be used as required to prevent insulation damage and overstressing of the wire while pulling through conduit. In no case shall conductors be greased or coated with any substance injurious to the conductor insulation or sheath.
3. All wires connected to terminal boards, terminal blocks, or to other similar terminals shall terminate by means of pressure terminals. Where terminal boards, terminal blocks, etc. are designed and manufactured to accept bare wire and have a pressure plate on each side of the wire, no pressure terminals on the wire will be required. Where the wire would have to encircle the holding screw to make a proper connection, the wire terminals are required.
4. Where the wire is shown larger than that required for the load, it is done so for voltage drop or other purposes and must be installed as shown. Where the wire is stranded, the removal of strands in order to install the wire into a lug provided on any equipment will not be permitted. A larger lug shall be installed which will accept the wire size indicated.
5. Each wire shall be labeled at both termination points with an adhesive type label as manufactured by Panduit Corporation, or equal. All wiring shall be neatly bundled and supported.
6. Insulation on ungrounded conductors larger than AWG #10 and on grounded (neutral) and grounding (equipment ground) conductors larger than AWG #6 may be black with color coding accomplished with the use of colored plastic tape. Tape shall be installed on the conductors wherever they are visible and shall be wrapped at least three (3) turns around the conductor.
7. All wiring on this project, except control wiring, shall be black for ungrounded conductors, white for neutral conductors.

D. Grounding:

1. Ground rods shall be driven vertically into the earth to at least one foot below finished grade. Where rock is encountered at a depth of less than four (4) feet, rods shall buried in a trench at not less than two feet below finished grade.
2. Connections to ground rods and all other ground connections below grade shall have a minimum mechanical contact surface area between the conductor and the ground rod of not less than three square inches. All connections made below finished grade shall be exothermic. Installation of grounding conductors shall be such that they are not exposed to physical damage. All connections shall be firm and tight.
3. All metal electrical equipment cabinets shall be securely bonded to a grounding conductor running through any conduit terminating at the cabinet or enclosure by use of a grounding lug bushing and jumper wire to the enclosure wall. Control cabinets shall be provided with an equipment ground bus (including lugs or screw terminals) securely bonded to the enclosure. Junction boxes and other enclosures shall utilize an equipment ground bus or lug as required to securely bond the equipment grounding conductor to the enclosure. The grounding conductor shall be connected with pressure connectors at the main switchgear to the main grounding system. Where screw terminals or set screw lugs are used, sufficient lugs shall be
provided such that not more than one conductor is installed into each lug or terminal.
4. No flexible conduit shall serve as a grounding conductor.
5. The grounding conductor serving motor circuitry shall be connected inside the entrance compartment to the motor frame with a bolted solderless pressure connector. Bolts, nuts, washers and other assorted hardware shall be bronze, cadmium plated steel, or other corrosion resistant material. The motor ground connection shall be to the motor frame and independent of the mounting bolts or sliding base.
6. Where lightning arresters are furnished and installed either separately or with equipment and the grounding connections are not inherently provided, a suitable, separate, grounding conductor shall connect the lightning arrester with a separate ground rod. This rod shall be interconnected with any adjacent grounding system.

E. Overload and Overcurrent Protection: Each set of overcurrent and overload protective devices shall be provided to correspond to the actual motor nameplate data. Before motors are energized, the Contractor shall submit to the Engineer two (2) copies of a listing of each motor, motor nameplate data (voltage/phase/hertz/full load amperes/locked rotor amperes/motor code letter/service factor), and proposed motor overload device(s) with trip setting(s).

3.02 ELECTRICAL FIELD ACCEPTANCE TESTS

A. General: After the electrical installation is complete, tests shall be made to demonstrate that the entire system is in proper working order and in accordance with the Drawings and

Specifications. The test outlined herein shall be in addition to, and not substitution for, the tests of the individual items at the manufacturer's plant. Insulation and ground resistance tests shall be made before operating tests.

B. Defective Equipment: All wiring and equipment found defective or failing to meet the specified requirements shall be replaced by the Contractor without charge, unless written permission for repair is given by the Engineer.

C. Operating Tests:

1. Switches, Circuit Breakers, Control Devices: All switches , circuit breakers, and control devices shall be operated to show correct and satisfactory operation.
2. Controls: Controls circuits shall be fully operated with the power circuits to the motors de-energized to assure proper sequence and operation before the system is energized.
3. Connections at motors, and motor control equipment shall not be made up permanently until correct phase rotation of all the equipment has been determined. These connections shall be installed and insulated temporarily, if necessary, while determining proper rotation. Permanent connections shall be made after proper rotation has been established and subsequent to the completion of the insulation resistance and dielectric tests.
4. After installation, the Contractor shall megger the windings of all motors. They shall be tested in accordance with and meet the requirements of IEEE Standard No. 43-1974, Recommended Practice for Testing Insulation Resistance of Rotating Machinery.
5. Each motor and its associated equipment shall be operated as nearly as possible under normal operating conditions for as long as reasonable and for a length of time sufficient to demonstrate correct alignment, temperature rise, speed, and satisfactory operation. The motors shall be loaded to full capacity or as near thereto as possible.

D. Insulation Resistance Tests: Each complete feeder with everything but power supply and power-consuming equipment, connected thereto, shall be tested and shall have an insulation resistance between conductors, between each conductor and ground, and between each conductor and any metallic conduit enclosing of not less than 1,000,000 ohms unless otherwise accepted by the Engineer.

E. Ground Resistance Tests: The Contractor shall test each entire grounding system for continuity of connections and for resistance. The ground resistance of conduits, equipment cases, and supporting frames shall not vary appreciably from that of the system as a whole and shall not exceed 5 ohms.

F. Witness: The Engineer shall be notified at least seven (7) calendar days in advance of each of the tests covered in this Section of the Specifications so that he may arrange to witness the tests.

G. Test Records: A record of all tests shall be delivered to the Engineer before final acceptance will be forthcoming.

3.03 OPERATION AND MAINTENANCE (O&M) MANUAL

A. At the completion of the Contract, the Contractor shall prepare two (2) copies of a manual, which shall include the following:

1. A complete parts list for each piece of equipment giving the model number and manufacturer of each item as it is listed in the original manufacturer's catalog.
2. Operations and maintenance instructions prepared by the equipment manufacturer.
3. An operating section in which step-by-step procedures are given. This Section shall contain drawings and diagrams as required for clarification and instruction.
4. Each manual shall be installed in a properly sized, hardback, loose-leaf filler.

END SECTION 16000

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

July 17, 2025

Regulatory Division
South Branch (RDS)
ID No. LRL-2025-00076

Mr. Adam Michels
Kentucky Transportation Cabinet (KYTC)
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Michels,

This is in response to your request for a Department of the Army (DA) permit to discharge dredged or fill material into "waters of the U.S." associated with improvements to 7.6 miles of US Highway 25 in Laurel County, KY. (KYTC Item No. 11-147). (Latitude: 37.102601, N/Longitude: -84.067896 W). The proposed reconstruction would impact 1,816 linear feet of stream and 0.83 acre of wetlands that flow into the Little Laurel River.

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 Transportation Letter of Permission (LOP) criteria, as specified in our regulations. Therefore, you are authorized, in accordance with 33 USC 1344, to place fill material into approximately 687 feet (0.122 acre) of perennial streams, 1,041 feet (0.043 acre) of intermittent streams, 88 feet of (0.002) ephemeral stream, and 0.83 acre of wetlands. This permission is granted with the following Special Conditions:

a. All work authorized by this permit shall be performed in strict compliance with the attached right of way plans, dated January 2025, and addendum submitted March 19, 2025 for KYTC Item No. 11-147, which are a part of this permit. Any modification to these plans affecting the authorized work shall be approved by the U.S. Army Corps of Engineers prior to implementation.

b. The Permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, drawings and attachments shall be available at the project site during the construction phase of this project.

c. The Permittee shall comply with all conditions of the Section 401 Water Quality Certification No. WQCLOP2025-020-7M1, dated May 19, 2025, issued by the KDOW, which are incorporated herein by reference.

d. Prior to the discharge of fill material, the Permittee shall provide the Corps written proof of purchase, in the form of a receipt of payment, of 504 stream EIUs from a Corps-approved mitigation bank authorized to sell credits in the service area. If there are no mitigation bank credits in the service area available for purchase, the permittee shall purchase 605 EIUs from the Kentucky Department of Fish and Wildlife Resources (KDFWR) Stream and Wetland Mitigation Program. The permittee must provide to the Corps proof of credit purchase, prior to the discharge of fill material into "waters of the U.S." No ILF credits shall be purchased unless there are no mitigation bank credits available for purchase in the service area.

e. Prior to the discharge of fill material, the Permittee shall provide the Corps written proof of purchase, in the form of a receipt of payment, of 1.7 wetland AMUs from a Corps-approved mitigation bank authorized to sell credits in the service area. If there are no mitigation bank credits in the service area available for purchase, the permittee shall purchase 2.0 AMUs from the KDFWR Stream and Wetland Mitigation Program. The permittee must provide to the Corps proof of credit purchase, prior to the discharge of fill material into "waters of the U.S." No ILF credits shall be purchased unless there are no mitigation bank credits available for purchase in the service area.

f. The Permittee shall implement all necessary precautions and measures so that any activity will not kill, injure, capture, harass, or otherwise harm any protected federally listed species. If the Permittee discovers or observes an injured/dead listed endangered or threatened species while accomplishing the authorized work, the Permittee shall immediately notify USACE to initiate the required Federal coordination.

g. This Department of the Army permit does not authorize you to take an endangered species. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a BO under ESA Section 7, with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service Biological Opinion (BO) "Federal Highway Administration Kentucky Division's 2020 Programmatic Consultation on the Effects of Transportation Projects in Kentucky on the Indiana Bat and Gray Bat, (April 17, 2020)" (Attachment 1) contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this Department of the Army permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached BO, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Department of the Army permit. The U.S. Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

LAUREL COUNTY
FD06/FD59 063 0025 009-011
Contract ID: 261517
Page 250 of 328

h. To mitigate for the loss of 5.06 acres of un-surveyed habitat, the Permittee shall contribute to the Imperiled Bat Conservation Fund and shall follow the process outlined in the FHWA 2020 Programmatic Consultation and accompanying biological opinion on the effects of transportation projects on the listed bat species between the FHWA, KYTC, and the USFWS Kentucky Field Office. If additional forested areas not previously considered in the DA permit application are to be cleared, the Permittee shall notify the Corps and the USFWS in advance of any additional tree clearing to determine if re-initiation of ESA consultation is required.

i. The Permittee shall not clear trees between April 1 and October 14 to avoid impacting listed bat species.

j. The time limit for completing the work authorized **ends on July 30, 2030**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.

k. Upon completion of construction, you are to notify the District Engineer. The enclosed Certification of Compliance must be completed and returned to this office.

For your information, effective March 9, 1999, the Corps of Engineers instituted an administrative appeals process. A permit applicant may appeal an individual permit denial or an individual permit that was issued with conditions (a proffered individual permit). To initiate the appeals process regarding the terms and conditions of this permit, you must write a letter to the district engineer explaining your objections to the permit. The enclosed Notification of Applicant Options (NAO) outlines the initial appeals process and options available to you. The objection letter must be received by the district engineer within 60 days of the date of the NAO. Please be aware that no work can occur in jurisdictional waters until the appeals process is completed.

Please indicate your acceptance of the terms and conditions of the permit by signing and dating both copies of the permit form on the lines provided for "Permittee" and "Date" and return one copy to us via email to crystal.d.byrd@usace.army.mil. This permit will not be valid until we receive the signed copy. Upon completion of the work authorized under this permit, the enclosed Completion Report form must be completed and returned to this office.

Should any modification of the plans become necessary for any reason, approval from the District Engineer must be received prior to the start of the work. Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

If you have any questions, please contact this office by writing to the above address, ATTN: CELRL-RDS, or by calling Mrs. Crystal Byrd at (606)784-9709. All correspondence pertaining to this matter should refer to our ID No. LRL-2025-00076.

LAUREL COUNTY
FD06/FD59 063 0025 009-011
Contract ID: 261517
Page 251 of 328

FOR THE DISTRICT ENGINEER:

Sincerely,

Eric G. Reusch
Chief, Regulatory Division
Louisville District

(I accept the conditions of this authorization):

Kentucky Transportation Cabinet

7-22-25
Date

Enclosures:
Transportation LOP General Conditions

1. USFWS Biological Opinion
2. Section 401 Water Quality Certification
3. Compliance Certification Form
4. 11-147 Plans/Drawings
5. NAO-RFA Form

Copies Furnished:

Robert Oney; Palmer Eng.
Roney@palmernet.com

Kentucky Division of Water
401WQC@ky.gov

LAUREL COUNTY
FD06/FD59 063 0025 009-011
Contract ID: 261517
Page 252 of 328

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

January 12, 2026

Mr. Adam Michels
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Michels,

This is in response to your request for a modification to Department of the Army (DA) permit LRL-2025-00076 (KYTC Item No. 11-147), which authorized the placement of dredged and fill material in "waters of the United States (U.S.)" associated with the reconstruction US HWY 25 in Laurel County, Kentucky. The original permit authorized impacts to 687 linear feet of perennial streams, 1,041 linear feet of intermittent streams, 88 linear feet of ephemeral streams and 0.83 acre of wetland. You are requesting authorization to modify the permit to change tree clearing date restrictions from April 1 to October 14 to May 15 to July 31.

Your proposed modification satisfies the Transportation Letter of Permission (LOP) criteria, as specified in our regulations. Therefore, you are authorized, in accordance with 33 USC 403, to modify the dates for tree removal. This permission is granted with the following modified Special Condition:

i. The permittee shall not clear trees between May 15 through July 31 to avoid impacting listed bat species.

Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

Upon acceptance of the terms and conditions of the permit, a copy of the permit form must be signed and dated on the lines provided for "Permittee" signature and "Date" on page 2 and emailed to crystal.d.byrd@usace.army.mil. If you have any questions, please contact this office by writing to the above address, ATTN: CELRL-RDS, or by calling Mrs. Crystal Byrd at (606) 784-9709. All correspondence pertaining to this matter should refer to our ID No. LRL-2025-00076.

FOR THE DISTRICT ENGINEER:

Sincerely,

Eric Reusch
Chief, Regulatory Division
Louisville District

(I accept the conditions of this authorization)

Adam Michels
Kentucky Transportation Cabinet (Permittee)

__1-12-26 Date

Enclosures:
Completion Report

Copies Furnished:

U.S. Fish and Wildlife Service
kentuckyES@fws.gov

Kentucky Energy & Environment Cabinet
Division of Water
401wqc@ky.gov

Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca W. Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

May 19, 2025

Danny Peake
Kentucky Transportation Cabinet (KYTC)
200 Mero St
Frankfort, KY 40622

Re: §401 Water Quality Certification
Letter of Permission No.:
WQCLOP2025-020-7M1
US 25 Reconstruction - Laurel Co
AI No.: 184718; Activity ID: APE20250001
USACE ID: LRL-2025-00076
KYTC Item No.: 11-147.00
Whitley Branch, and Unnamed Tributaries
Laurel County, Kentucky

Dear Mr. Peake:

This letter transmits to you a copy of our General Water Quality Certification for the Letter of Permission Authorizing Transportation Projects for the Kentucky Transportation Cabinet – US 25 Reconstruction Project in Laurel 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 5/5/2025, including impacts to 687 linear feet of perennial stream, 1,041 linear feet of intermittent stream, 88 linear feet of jurisdictional ephemeral stream, 109 linear feet of non-jurisdictional ephemeral stream, 0.83 acres of jurisdictional wetland, and 1.1 ac of non-jurisdictional wetland. Compensatory mitigation will be accomplished through purchasing 504 stream EIUs from the Upper Cumberland Mitigation Bank (LRN-2019-00546) or 605 stream EIUs from KDFWR's in-lieu fee program and 1.7 wetland AMUs from KYTC's Wayne County Mitigation Bank (LRN-2011-00036). A receipt of purchase must be submitted to the Kentucky 401 Water Quality Certification Section before construction begins.

An individual Water Quality Certification 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.

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)

All future correspondence on this project must reference AI No. 184718. Please contact Bryan Killian by phone at 502-782-4695 or email at bryan.killian@ky.gov if you have any questions.

Sincerely,

Samantha Vogeler

Samantha Vogeler, Supervisor
Water Quality Certification Section
Kentucky Division of Water

SV:BK
Attachment

cc: Adam Michels, KYTC: Frankfort (via email: adam.michels@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 (via email: Crystal.D.Byrd@usace.army.mil)
Josh Lillpop, USFWS: Frankfort (via email: kentuckyes@fws.gov)
Colin Duncan, Upper Cumberland River Basin Coordinator (via email: colin.duncan@ky.gov)
Robert Miller, London Regional Office (via email: robertl.miller@ky.gov)
Robert Oney, Palmer (via email: roney@palmernet.com)

Water Quality Certification -- Letter of Permission Authorizing Transportation Projects (LRL-2006-259-pgj- Date: 11 Sept 2020)

This Water Quality Certification is issued December 28, 2020, 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.

The Commonwealth of Kentucky hereby certifies under Section 401 of the Clean Water Act (CWA) that it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 304, 306 and 307 of the CWA, will not be violated for the activities covered by this general certification, provided that the conditions in this general certification are met. Activities that do not meet the conditions of this certification require an Individual Section 401 Water Quality Certification.

For this and all 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.

As required by 40 CFR Part 121 – State Certification of Activities Requiring a Federal License or Permit, all conditions include a statement explaining why the condition is necessary to assure that any discharge authorized under the general permit will comply with water quality requirements and a citation to federal, state, or tribal law that authorizes the condition. The statements and citations are included with each condition. The statements are written entirely at the end of the certification under the section *Statements of Necessity*.

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 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 Kentucky Division of Water shall be notified 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. [Statement G and citations KRS 224.10-100, KRS 224.70-110, 401 KAR 10:030 Section 1; and 401 KAR 10:031 Section 2(1)(a)]

2. As-built drawings shall be submitted to the Kentucky Division of Water within 90 days after substantial completion of construction. [Statement H and citations KRS 224.10-100, KRS 224.70-110, 401 KAR 10:030 Section 1; and 401 KAR 10:031 Section 2(1)(a)]

Certification of Transportation Letter of Permission

3. A copy of the receipt for purchase of credits for compensatory mitigation shall be submitted to the Division of Water prior to any construction activity for projects requiring mitigation. [Statement I and citations KRS 224.10-100, KRS 224.70-110, 401 KAR 10:030 Section (1); and 401 KAR 10:031 Section 2(1)(a)]

4. Activities occurring within surface waters identified by the Kentucky Division of Water as designated or candidate Outstanding State or National Resource Waters, Cold Water Aquatic Habitat, or Exceptional Waters are not authorized under this General Certification and require an Individual Certification. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(1), Section 1(2), & Section 1(3); and 401 KAR 10:031, Section 4(2) & Section 8]

5. The activity will not occur within surface waters identified as perpetually-protected mitigation sites (e.g., deed restriction or conservation easement). [Statement C and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3); and 40 C.F.R. 230.97]

6. 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. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

7. 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. [Statement A and B and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

8. 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. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

9. 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 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, 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. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

Certification of Transportation Letter of Permission

10. Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse. [Statements A and D and citations [KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

11. Removal of riparian vegetation shall be limited to that necessary for equipment access. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

12. To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

13. 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 shall be performed in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

14. Any fill shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If 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. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

15. If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when such work will be done. [Statement E and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

16. Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling (800) 928-2380. [Statement A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

This Water Quality 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: 11 Sept 2020) then a new certification may be issued.

Certification of Transportation Letter of Permission

Statements of Necessity:

A. This condition is necessary to protect waters categorized under the anti-degradation policy to protect the designated and existing uses and to maintain the associated water quality criteria necessary to protect these water resources.

B. This condition is necessary to protect existing uses and the level of water quality necessary to protect those existing uses shall be assured in impaired water.

C. This condition is necessary for long-term protection of compensatory mitigation sites.

D. This condition is necessary to provide for the prevention, abatement, and control of all water pollution and to conserve water resources for legitimate uses, safeguard from pollution the uncontaminated waters, prevent the creation of any new pollution, and abate any existing pollution.

E. This condition is necessary to protect domestic water supply use.

F. This condition is necessary to evaluate, develop, and improve best-management practices in conservation plans, compliance plans, and forest stewardship management plans; establish statewide and regional agriculture water quality plans; and otherwise promote soil and water conservation activities that protect waters of the Commonwealth from the adverse impacts of agriculture operations within the Commonwealth.

G. This condition is necessary for the Division of Water to be informed of the ongoing activity for the purposes of site visits to ensure implementation of Kentucky Regulatory Statutes and Administrative Regulations; the Division will monitor the environment to afford more effective and efficient control practices, to identify changes and conditions in ecological systems, and to warn of emergency conditions.

H. This condition is necessary for the Division of Water to monitor the environment to afford more effective and efficient control practices, to identify changes and conditions in ecological systems, and to warn of emergency conditions.

I. This condition is necessary to allow the impact to occur. Compensatory mitigation is the method to approve impacts and entire loss of a water resource. The Division can approve necessary impacts and loss based on the confidence that the resource will be replaced and not taken form the watershed entirely. Compensatory mitigation is the method of compliance for the Commonwealth's water quality standards.

Violation of Kentucky state water quality standards may result in civil penalties and remediation actions.

Kentucky Transportation Cabinet

Highway District 11

And

_____(2), Construction

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

Groundwater protection plan

For Highway Construction Activities

For

11-147, Laurel, US-25

Project: CID ## -

Revised 3/4/2016

Project information

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

1. Owner – Kentucky Transportation Cabinet, District 11

2. Resident Engineer: (2)

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

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

4. Project Control Number (2)

5. Route (Address): US-25

6. Latitude/Longitude (project mid-point): 37.100032, -84.068737

7. County (project mid-point): Laurel

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

9. Projected completion date: (2)

A. Site description:

1. Nature of Construction Activity: Reduce congestion, and improve connectivity and access along US-25.

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

3. Projected volume of material to be moved: Cut = 158,842 yds
   Fill = 103,136 yds

KyTC BMP Plan for Project CID ## - ####

4. Estimate of total project area (acres): 112.1 acres

5. Estimate of area to be disturbed (acres): 105.2 acres

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

7. Data describing existing soil condition: The majority of the soil in the project area consists of Whitley Silt Loam on shallow slopes. It is a well drained fine-silty residuum weathered from interbedded sedimentary rock.

8. Data describing existing discharge water quality (if any): None.

9. Receiving water names: Whitley Branch, Little Laurel River.

10. TMDLs and Pollutants of Concern in Receiving Waters: Whitley Branch from RMP 0.0-1.0 is impaired by E. coli with an approved TMDL. Suspected sources are Municipal Point Source Discharges. Whitley Branch from RMP 1.0-2.2 is impaired by Fecal Coliform with an approved TMDL. Suspected sources are Sanitary Sewer Overflows (Collection System Failures). Little Laurel River from RMP 12.8-15.0 is impaired by Fecal Coliform with an approved TMDL. Suspected sources are unknown. This project is not expected to contribute to the TMDL for either E. coli or Fecal Coliform.

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: A proposed detention basin near Rosedale Avenue and KY-229 (Relocated US-25) in order to minimize impacts to Whitley Branch.

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.

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.

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);

KyTC BMP Plan for Project CID ## - ####

_____ 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.

Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

John S. Lyons
SECRETARY

Anthony R. Hatton
COMMISSIONER

June 1, 2026

Chris Jones
Kentucky Transportation Cabinet - District 11
603 Railroad Ave
Manchester, KY 40962

Re: KYR10 Coverage Acknowledgment
KPDES No.: KYR10T910
11-147: US-25 Congestion Relief & Widening
Permit Type: Construction Stormwater
AI ID: 184718
Laurel County, Kentucky

Dear Chris J Jones :

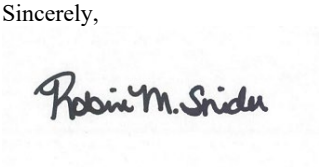
The discharges associated with the Notice of Intent you submitted have been approved for coverage under the "Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Storm Water Discharges Associated with Construction Activities (KYR100000)" master general permit. Your coverage becomes effective on the date of this letter. This coverage automatically terminates two years from the effective date of your coverage unless an extension is requested prior to the termination date, or the Division of Water revokes coverage, whichever comes first. During this period of coverage all discharges shall comply with the conditions of the KYR100000 master general permit. This permit and links to the eNOI (and permit coverage extension) and eNOT forms can be found on our website:
https://eec.ky.gov/Environmental-Protection/Water/PermitCert/KPDES/Documents/KYR10PermitPage.pdf.

Any person aggrieved by the issuance of a permit final decision may demand a hearing pursuant to KRS 224.10-420(2) within thirty (30) days from the date of the issuance of this letter. Any demand for a hearing on the permit shall be filed in accordance with the procedures specified in KRS 224.10-420, 224.10-440, 224.10-470, and the regulations promulgated thereto. The request for hearing should be submitted in writing to the Energy and Environment Cabinet, Office of Administrative Hearings, 211 Sower Boulevard, Frankfort, Kentucky 40601 and the Commonwealth of Kentucky, Energy and Environment Cabinet, Division of Water, 300 Sower Boulevard, Frankfort, Kentucky 40601. For your record keeping purposes, it is recommended that these requests be sent by certified mail. The written request must conform to the appropriate statutes referenced above.

Any questions concerning the general permit and its requirements should be directed to me at 502-782-7076 or email me at Robin.Snider@ky.gov

Construction Site GPS Coordinates: 37.104028, -84.062667
Receiving Water: Little Laurel River

Sincerely,

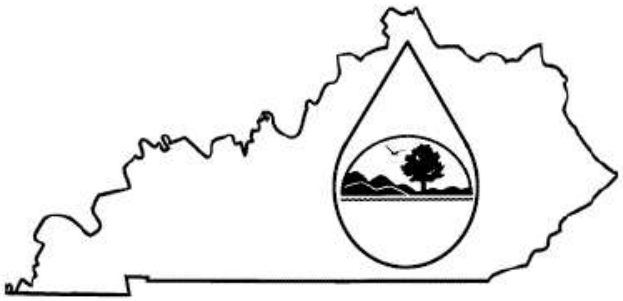


Robin Snider
Surface Water Permits Branch
Division of Water

cc: Joshua Higgins , eNOI Preparer
Rob Miller, London Regional Office

Thank you for submitting your information via the Kentucky Department for Environmental Protection eForms website. Please save a copy of this submittal for your records. We recommend saving a copy as a .mht, .html, or .htm file.
The Submittal ID for this transaction is 585408 and was submitted by Joshua Higgins on May 29, 2026 02:33 PM Eastern Time.

If you need to contact EEC regarding your submission, please reference your Submittal ID. The eForm Submittal ID allows you to use the data from this form as a template. In addition, you may download a copy of your submittal by returning to the details page.



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/KYR10%20Instructions.pdf)

Click here to obtain information and a copy of the KPDES General Permit. (https://eec.ky.gov/Environmental-Protection/Water/PermitCert/KPDES/Documents/KYR10PermitPage.p

(*) 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:(✓)
Change to Existing Coverage	184718	KYR10T910

If change to existing permit coverage is requested, describe the changes for which modification of coverage is being sought: (✓)

Two additional discharge points have been added to the project. Mailing address for Facility Operator updated.

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.

COVERAGE:
Applicants shall complete and submit the eNOI-SWCA a minimum of seven (7) days before the proposed date for commencement of construction activities. Applicants shall receive written notification from the Division of Water before being authorized to discharge under the terms of the KYR10 General Permit.

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	Chris	J	Jones

Mailing Address:(*)	City:(*)	State:(*)	Zip:(*)
178 HWY 3561 / 200 Transporta	Manchester	Kentucky	40962

eMail Address:(*)	Business Phone:(*)	Alternate Phone:
chrisj.jones@ky.gov	606-598-2145	Phone

Additional Facility Operator information(Co-Permittee) required ?(*)
No

SECTION II -- GENERAL SITE LOCATION INFORMATION

Project Name:(*)	Status of Owner/Operator (*)	SIC Code(*)
11-147: US-25 Congestion Relief & Widening	State Government	1611 Highway and St

Company Name:(✓)	First Name:(✓)	M.I.:	Last Name:(✓)
Kentucky Transportation Cabinet - District	Chris	J	Jones

Site Physical Address:(*)
Laurel County, US-25 MP 8.8 - 10.5 and KY-229 MP 10.9 - 12.2

City:(*)	State:(*)	Zip:(*)
London	Kentucky	40741

County:(*)	Latitude(decimal degrees)(*)	Longitude(decimal degrees)(*)
Laurel	DMS to DD Converter (https://www.fcc.gov/media/radio/dms-decimal) 37.104028 5 or 6 decimal places	-84.062667 5 or 6 decimal places

SECTION III -- SPECIFIC SITE ACTIVITY INFORMATION

Section III requires part A or part B to be completed.

Project Description:(*)
US-25 congestion relief and widening, and new connector from US-25 to KY-229.

Was the pre-development land used for agriculture ?(*)	Will there be demolition of any structure built or renovated before January 1, 1980 ? (*)
No	

No

Select the type of construction site (check all that apply)(*)

- [ ] Single-Family Residential
- [ ] Multi-Family Residential
- [ ] Commercial
- [ ] Industrial
- [ ] Institutional
- [x] Highway or Road
- [ ] Utility
- [ ] Other

a. For single projects provide the following information

Total Number of Acres in Project:(✓)	Total Number of Acres Disturbed:(✓)
112.1	112.1
Anticipated Start Date:(✓)	Anticipated Completion Date:(✓)
8/23/2026	8/23/2028

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 -- INFORMATION IS ALWAYS REQUIRED FOR ONSITE POINT OF DISCHARGE AND RECEIVING

WATER

Complete the following table if the permitted site discharges to a water body. Please note that if you enter a row in hte below table, all columns are required to be filled out.

Unnamed Tributary?: Does discharge enter an unnamed tributary prior to entering a named receiving water?

Latitude in decimal degrees: Format must be between 36.490000 and 39.150000, with a minimum of 5 decimal points of accuracy.

Longitude in decimal degrees: Format must be between -89.580000 and -81.960000, with a minimum of 5 decimal points of accuracy.

Receiving Water Name: Receiving water name must be from the following list of possible receiving waters.(click here for a list (Controls/ReceivingStream.htm)). If the discharge flows into an unnamed tributary, please enter the first “named” receiving water for which the unnamed tributary(ies) eventually flows into.

Discharge Point(s):(*)

Unnamed Tributary?	Longitude	Receiving Water Name	
Yes	37.084852	-84.06112	Little Laurel River
No	37.109143	-84.066579	Whitley Branch
No	37.115937	-84.072106	Whitley Branch
No	37.105154	-84.060594	Whitley Branch
No	37.10534	-84.060634	Whitley Branch
No	37.104927	-84.062276	Whitley Branch
No	37.10204	-84.06426	Whitley Branch
No	37.102565	-84.062694	Whitley Branch
No	37.100934	-84.063096	Whitley Branch
No	37.100856	-84.063234	Whitley Branch
No	37.100784	-84.063293	Whitley Branch
No	37.10095	-84.063566	Whitley Branch
No	37.109487	-84.066793	Whitley Branch
Yes	37.089143	-84.06297	Little Laurel River
No	37.116133	-84.07218	Whitley Branch
No	37.099803	-84.063434	Whitley Branch
Yes	37.099028	-84.063615	Whitley Branch
Yes	37.097707	-84.063783	Whitley Branch
Yes	37.096792	-84.064135	Whitley Branch
No	37.106655	-84.062618	Whitley Branch
No	37.106122	-84.062258	Whitley Branch
No	37.107395	-84.063102	Whitley Branch
No	37.10771	-84.064783	Whitley Branch
No	37.109752	-84.067045	Whitley Branch
No	37.10872	-84.064719	Whitley Branch

No	37.108621	-84.064602	Whitley Branch
No	37.104906	-84.060999	Whitley Branch
No	37.104288	-84.061175	Whitley Branch
Yes	37.116138	-84.073146	Whitley Branch
No	37.10992	-84.067205	Whitley Branch
Yes	37.090125	-84.063406	Little Laurel River
No	37.110754	-84.066901	Whitley Branch
No	37.11172	-84.066489	Whitley Branch
No	37.112576	-84.064905	Whitley Branch
No	37.112342	-84.06468	Whitley Branch
No	37.11628	-84.072418	Whitley Branch
No	37.109956	-84.068857	Whitley Branch
No	37.109917	-84.069147	Whitley Branch
No	37.111538	-84.068766	Whitley Branch
No	37.112357	-84.069416	Whitley Branch
Yes	37.116138	-84.074544	Whitley Branch
No	37.112094	-84.069239	Whitley Branch
No	37.113298	-84.070118	Whitley Branch
Yes	37.093419	-84.064708	Little Laurel River
Yes	37.118053	-84.073142	Whitley Branch
Yes	37.117856	-84.073998	Whitley Branch
Yes	37.088372	-84.06265	Little Laurel River
Yes	37.120153	-84.075267	Whitley Branch
Yes	37.118649	-84.075135	Whitley Branch
Yes	37.117706	-84.075085	Whitley Branch
Yes	37.117671	-84.075139	Whitley Branch
Yes	37.09052	-84.06339	Little Laurel River
Yes	37.117681	-84.075267	Whitley Branch
Yes	37.11788	-84.075254	Whitley Branch
No	37.11067	-84.068078	Whitley Branch
No	37.114616	-84.070627	Whitley Branch
Yes	37.095253	-84.065406	Little Laurel River
No	37.107849	-84.065711	Whitley Branch
No	37.114936	-84.071375	Whitley Branch
Yes	37.119421	-84.075126	Whitley Branch

Yes	37.095392	-84.065801	Little Laurel River
Yes	37.095511	-84.06612	Little Laurel River
Yes	37.095807	-84.066349	Little Laurel River
No	37.113493	-84.070179	Whitley Branch
Yes	37.096206	-84.066558	Little Laurel River
Yes	37.096866	-84.066851	Whitley Branch
Yes	37.097144	-84.066997	Whitley Branch
No	37.097503	-84.067259	Whitley Branch
No	37.108026	-84.065866	Whitley Branch
Yes	37.084881	-84.061026	Little Laurel River
No	37.097703	-84.067273	Whitley Branch
No	37.097997	-84.067434	Whitley Branch
No	37.098472	-84.067653	Whitley Branch
No	37.098703	-84.067788	Whitley Branch
No	37.098891	-84.067907	Whitley Branch
No	37.114365	-84.070728	Whitley Branch
No	37.099157	-84.067884	Whitley Branch
No	37.100115	-84.068249	Whitley Branch
No	37.100288	-84.068622	Whitley Branch
No	37.108196	-84.06566	Whitley Branch
No	37.100533	-84.068737	Whitley Branch
No	37.101105	-84.068514	Whitley Branch
Yes	37.085809	-84.06124	Little Laurel River
No	37.101123	-84.068945	Whitley Branch
No	37.101516	-84.069179	Whitley Branch
No	37.10206	-84.069384	Whitley Branch
No	37.103115	-84.070016	Whitley Branch
No	37.114089	-84.069701	Whitley Branch
No	37.103292	-84.070026	Whitley Branch
No	37.105141	-84.071014	Whitley Branch
No	37.10857	-84.066035	Whitley Branch
No	37.105992	-84.071322	Whitley Branch
No	37.105600	-84.071098	Whitley Branch
No	37.102253	-84.071145	Whitley Branch
No	37.102216	-84.070845	Whitley Branch

Yes	37.087861	-84.061935	Little Laurel River
No	37.101681	-84.069685	Whitley Branch
Yes	37.094982	-84.068294	Little Laurel River
Yes	37.094985	-84.068922	Little Laurel River
No	37.115523	-84.071704	Whitley Branch
Yes	37.095179	-84.069688	Little Laurel River
No	37.108818	-84.066144	Whitley Branch
Yes	37.09543	-84.069394	Little Laurel River
Yes	37.092295	-84.065003	Little Laurel River
Yes	37.092063	-84.066536	Little Laurel River
Yes	37.091397	-84.065642	Little Laurel River
Yes	37.090859	-84.065207	Little Laurel River
Yes	37.09125	-84.065069	Little Laurel River
Yes	37.087952	-84.061952	Little Laurel River
Yes	37.091199	-84.064423	Little Laurel River
Yes	37.090854	-84.064261	Little Laurel River
No	37.115759	-84.071834	Whitley Branch
No	37.109645	-84.065979	Whitley Branch
Yes	37.09004	-84.063837	Little Laurel River
Yes	37.090236	-84.063935	Little Laurel River
Yes	37.091067	-84.065568	Little Laurel River
No	37.102095	-84.068583	Whitley Branch
No	37.102768	-84.068135	Whitley Branch
No	37.102457	-84.067966	Whitley Branch
No	37.102834	-84.067892	Whitley Branch
No	37.102515	-84.06768	Whitley Branch
Yes	37.088758	-84.062744	Little Laurel River
No	37.105019	-84.063488	Whitley Branch



This grid can be edited either directly on this page or by editing the information in an excel sheet.
If you would like to edit this information in an excel sheet, first use the right button (export) to download the sheet.
After adding your data, save the sheet, and use the left button (import) to import the same file to this grid.

SECTION V -- Section V MUST BE COMPLETED IF WITHIN A MS4 AREA

Name of MS4:

SECTION VI -- WILL THE PROJECT REQUIRE CONSTRUCTION ACTIVITIES IN A WATER BODY, FLOODPLAIN OR THE RIPARIAN ZONE?

Will the project require construction activities in a water body or the riparian zone?: (*)	Yes
If Yes, describe scope of activity:(✓)	Channel change, bridge replacement, RCBC placem
Is a Clean Water Act 404 permit required?:(*)	Yes
Is a Clean Water Act 401 Water Quality Certification required?: (*)	Yes

SECTION VII -- NOI PREPARER INFORMATION

First Name:(*)	M.I.:	Last Name:(*)	Company Name:(*)
Joshua	J	Higgins	Kentucky Transportation Cabinet - District

Mailing Address:(*)	City:(*)	State:(*)	Zip:(*)
178 HWY 3561 / 200 Transporta	MANCHESTER	Kentucky	40962

eMail Address:(*)	Business Phone:(*)	Alternate Phone:
joshuaj.higgins@ky.gov	606-598-2145	Phone

SECTION VIII -- ATTACHMENTS

Facility Location Map:(*)	Upload file 11-147 KPDES eNOI Map 2026.05.28.pdf
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.

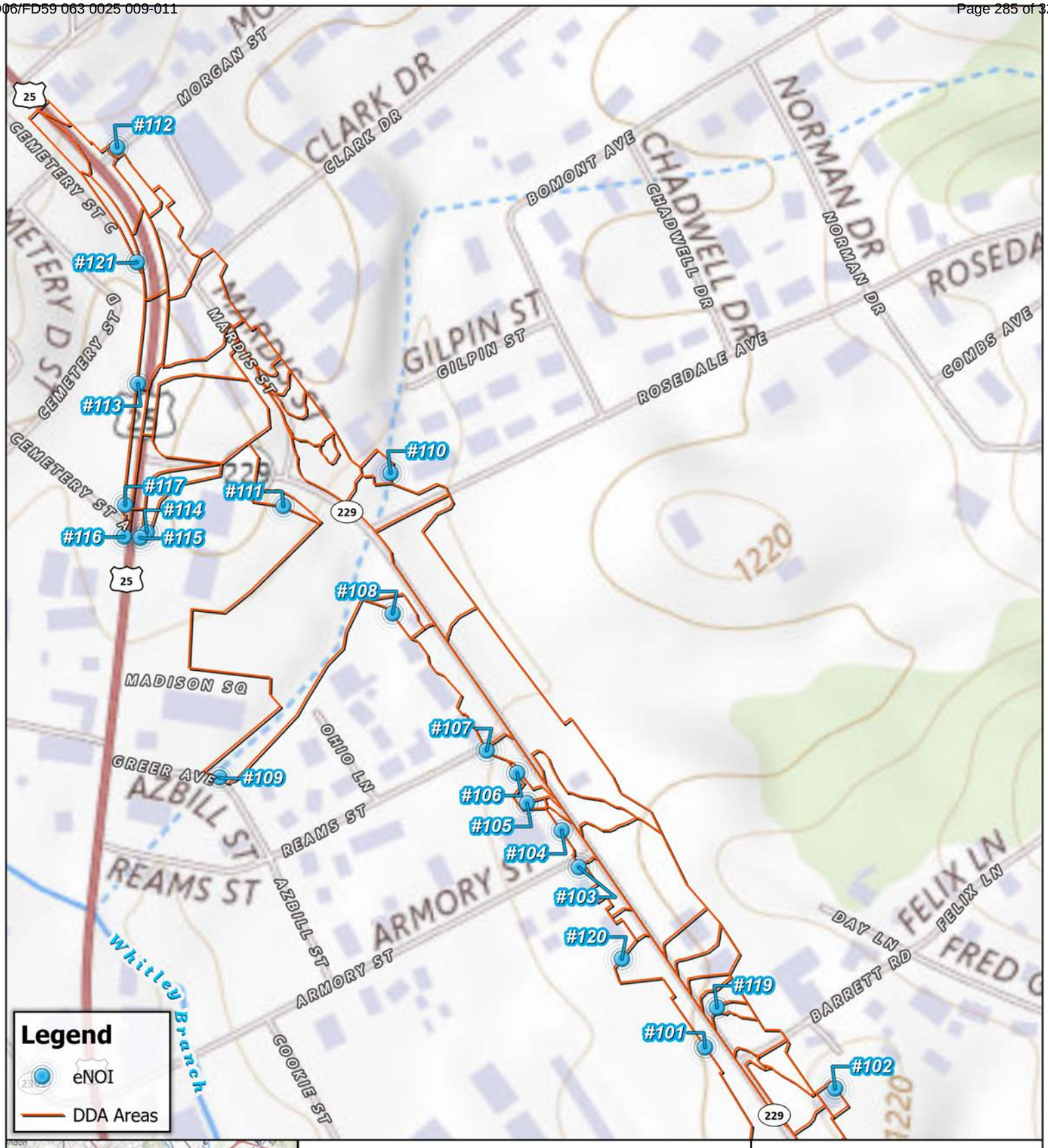
Signature:(*)	Title:(*)
Chris J. Jones	Chief District Engineer

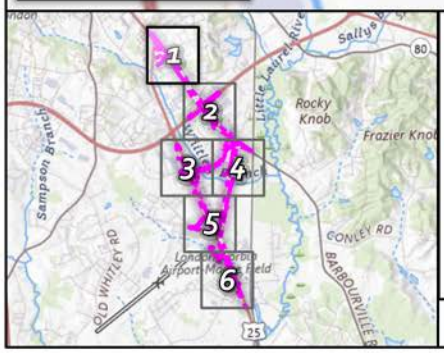
First Name:(*)	M.I.:	Last Name:(*)
Chris	J	Jones

eMail Address:(*)	Business Phone:(*)	Alternate Phone:	Signature Date: (*)

chrisj.jones@ky.gov	606-598-2145	Phone	5/29/2026

Click to Save Values for Future Retrieval | Click to Submit to EEC





eNOI Locations

Reconstruction of US 25
Laurel County, Kentucky
KYTC Item No. 11-147.00

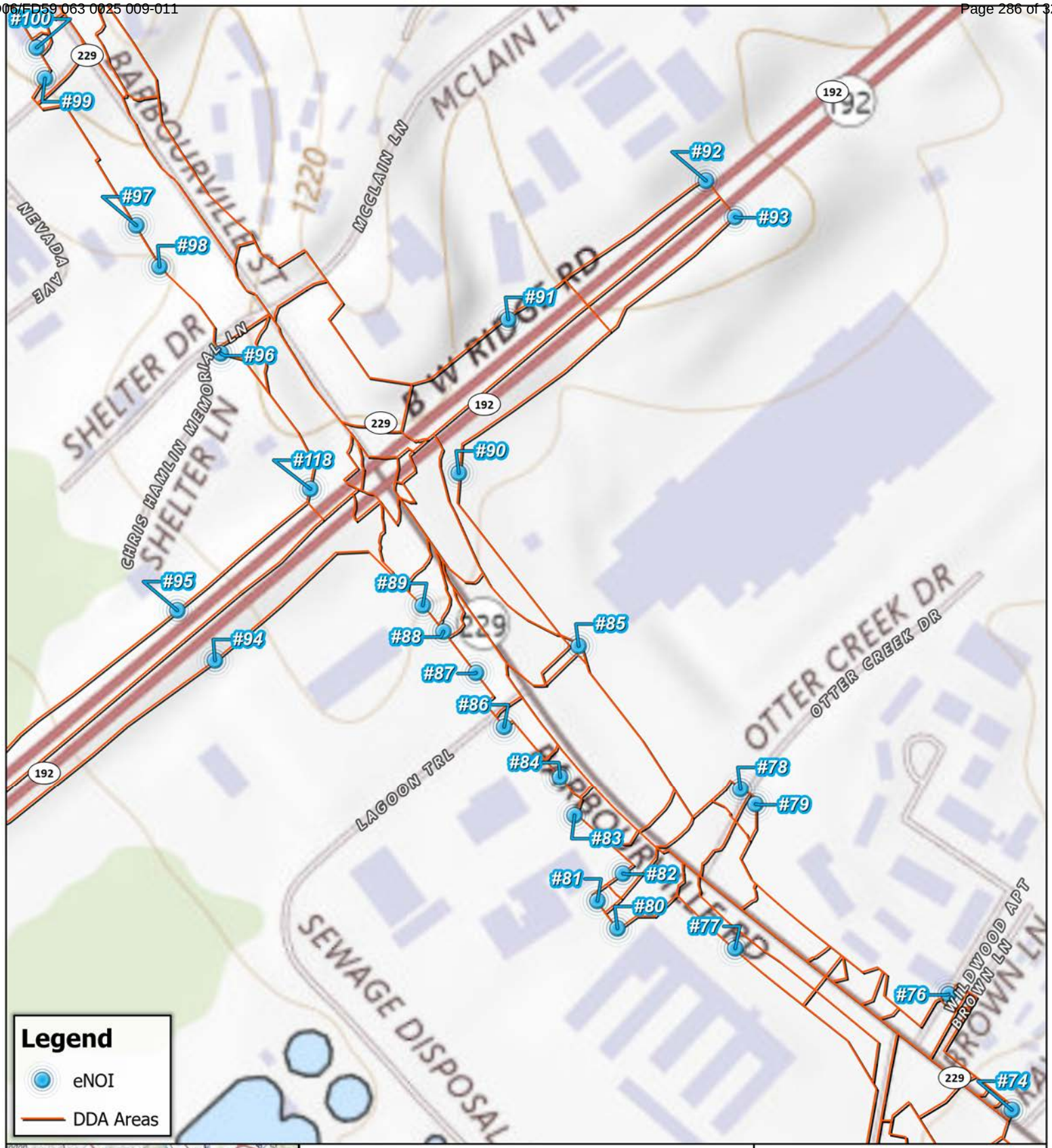
Credits: USGS The National Map
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

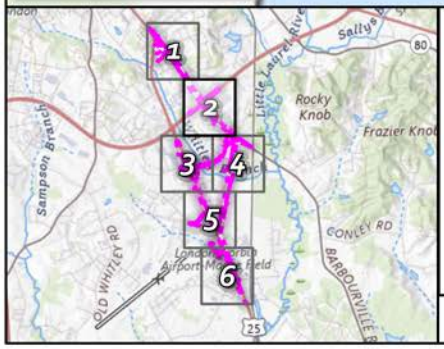
N

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500
Feet

Palmer ENGINEERING





eNOI Locations

Reconstruction of US 25
Laurel County, Kentucky
KYTC Item No. 11-147.00

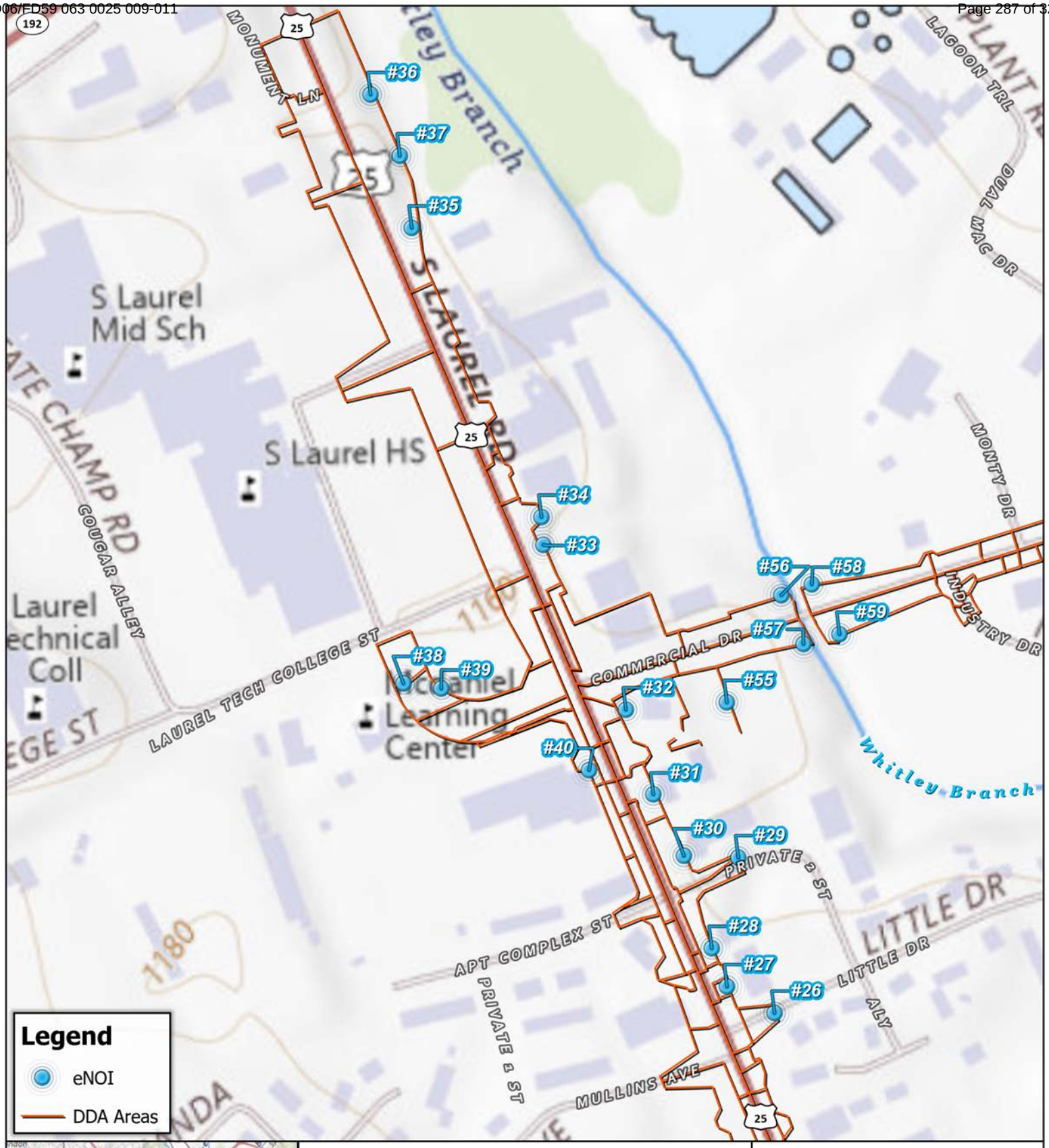
Credits: USGS The National Map
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

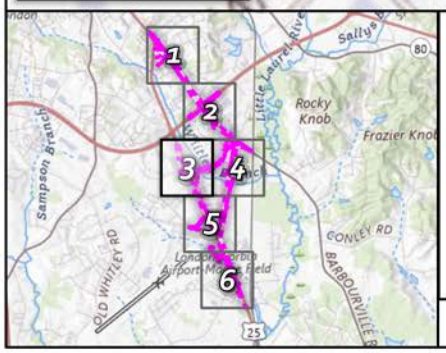
N

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500
Feet

Palmer ENGINEERING





eNOI Locations

Reconstruction of US 25
Laurel County, Kentucky
KYTC Item No. 11-147.00

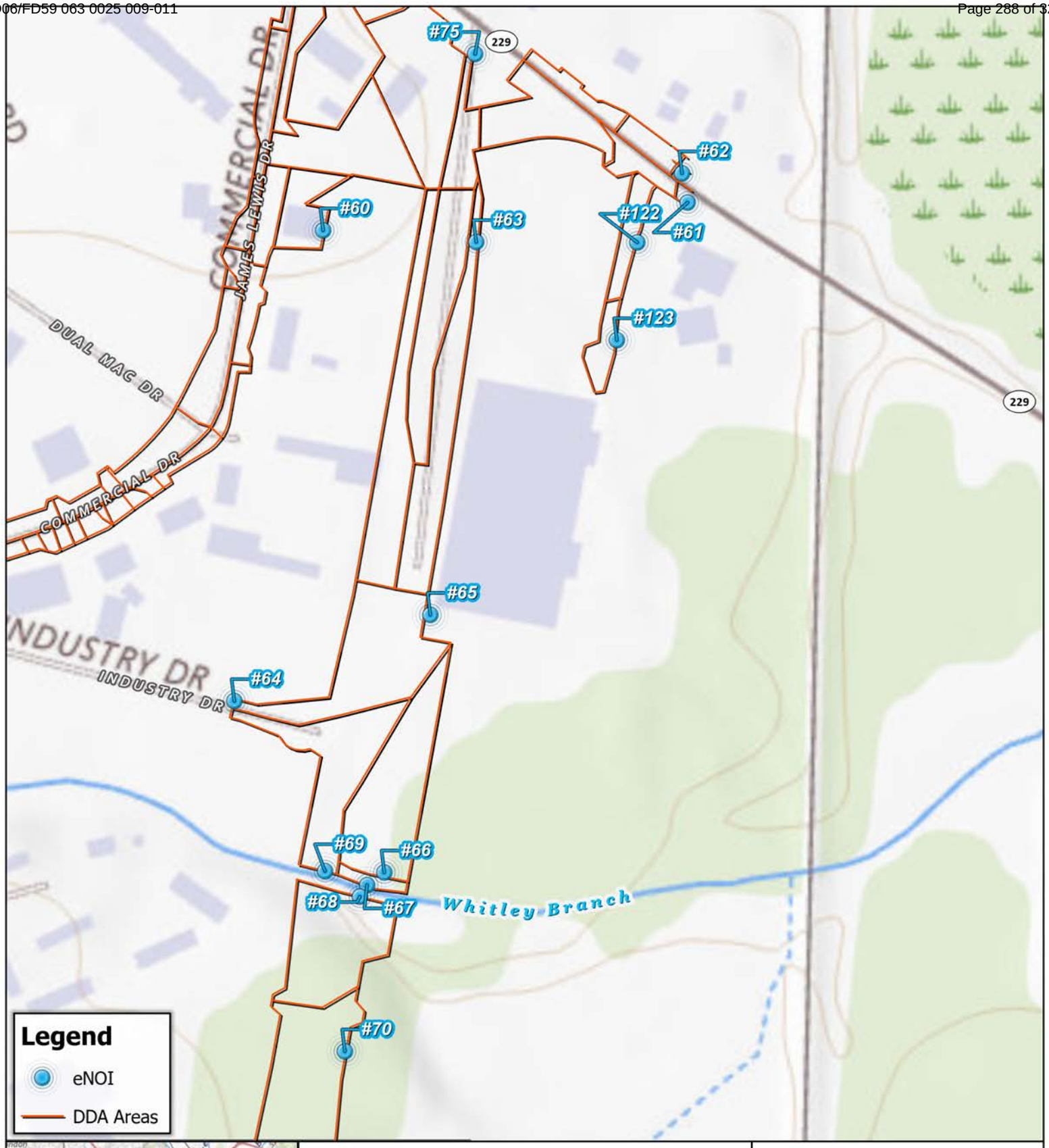
Credits: USGS The National Map
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

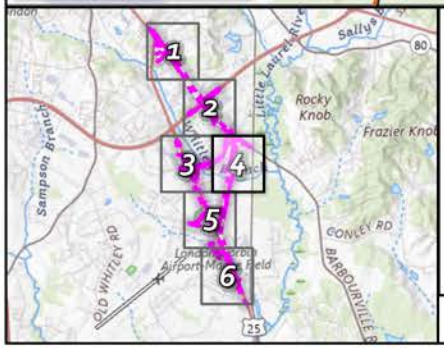
N

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500
Feet

Palmer ENGINEERING





eNOI Locations

Reconstruction of US 25
Laurel County, Kentucky
KYTC Item No. 11-147.00

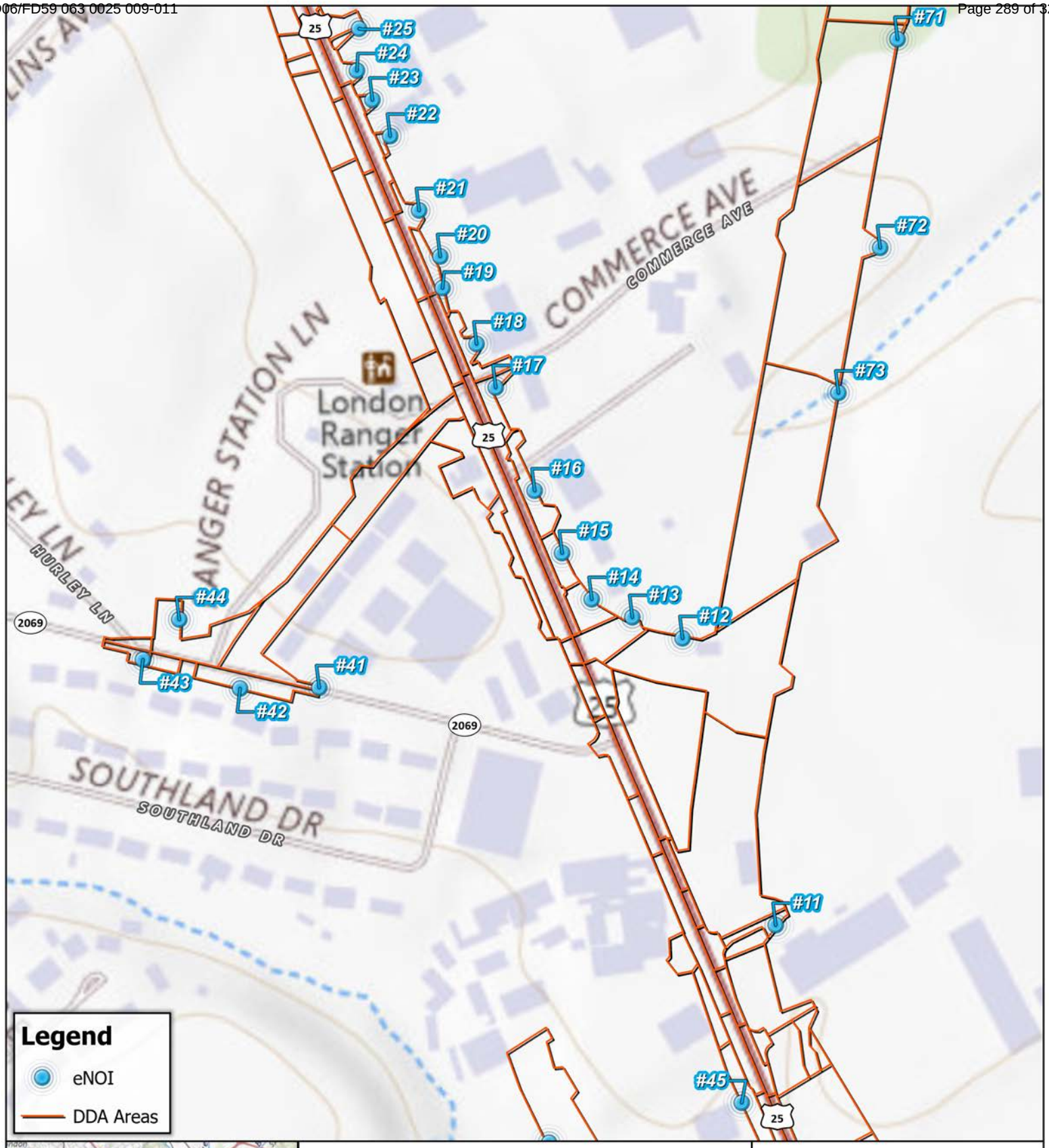
Credits: USGS The National Map
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

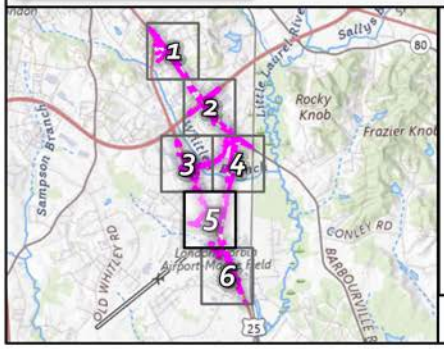
N

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500
Feet

Palmer ENGINEERING





eNOI Locations

Reconstruction of US 25
Laurel County, Kentucky
KYTC Item No. 11-147.00

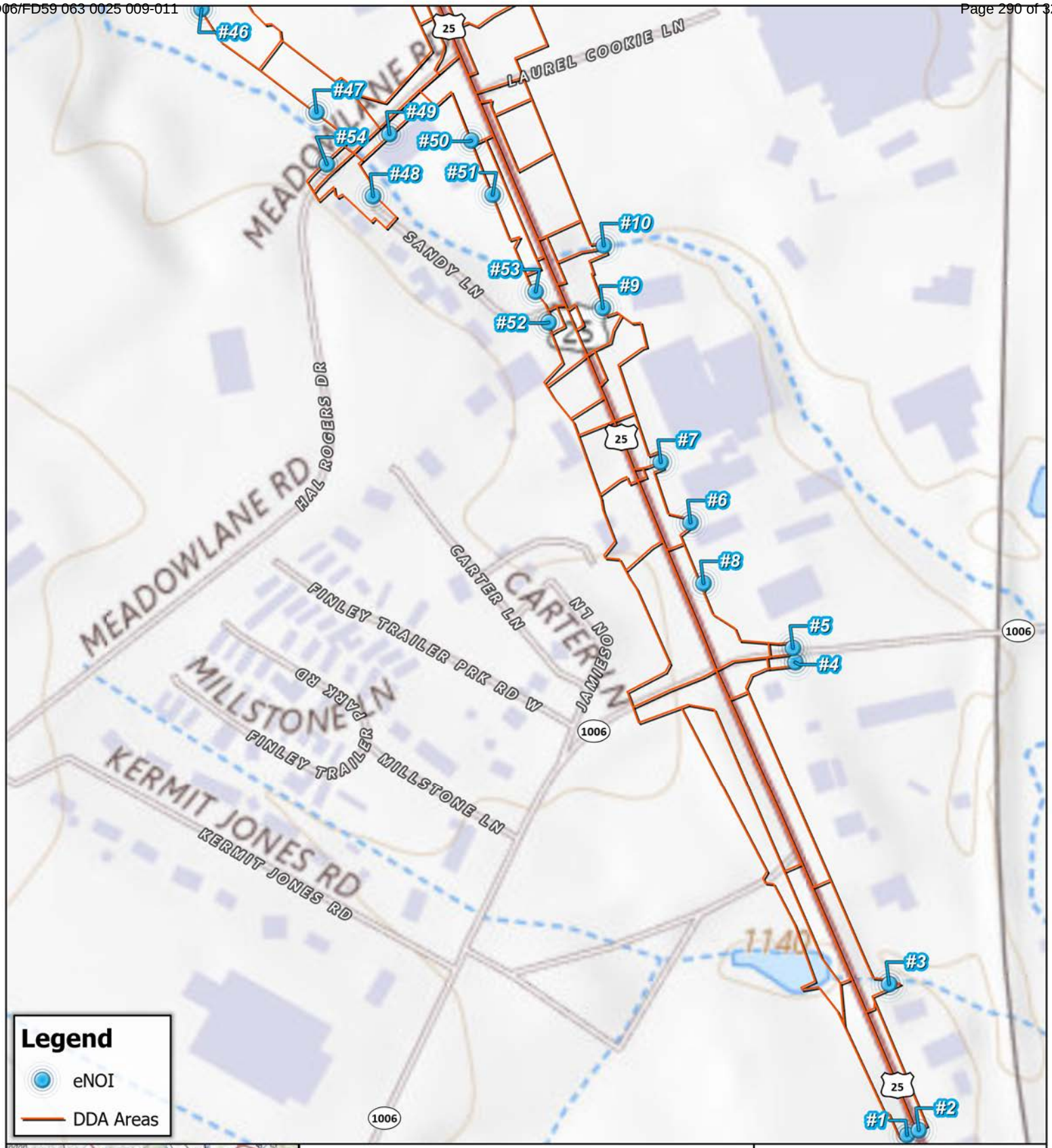
Credits: USGS The National Map
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

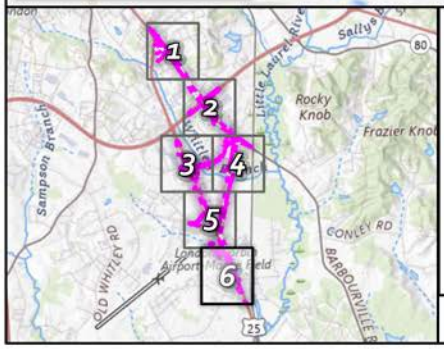
N

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500
Feet

Palmer ENGINEERING





eNOI Locations

Reconstruction of US 25
Laurel County, Kentucky
KYTC Item No. 11-147.00

Credits: USGS The National Map
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet

N

TEAM KENTUCKY TRANSPORTATION CABINET

0 250 500
Feet

Palmer ENGINEERING

KENTUCKY TRANSPORTATION CABINET
COMMUNICATING ALL PROMISES (CAP)

Item No. 11 - 147 **County:** Laurel **Route:** 25 **Project Manager:** SHERRI CHAPPELL

7/29/26

CAP #	Date of Promise	Promise made to:	Location of Promise:	CAP Description
1	1/5/26	Sherri Chappell	P144	The temporary loss of parking on Parcel 144 will be limited to a total of 6 spaces; 2 parking spaces within the permanent easement and 4 parking spaces within the temporary easement. The disturbance will be limited to only half of the parking spaces at a time and no parking space will be closed for longer than six months at a time.
2	1/5/26	Sherri Chappell	P146	The temporary loss of parking on Parcel 146 is a total of 21 spaces; 2 parking spaces within the permanent easement and 19 parking spaces within the temporary easement. The disturbance will be limited to only half of the parking spaces and no parking space will be closed for longer than six months at a time. Additionally, the two post sign shall not be disturbed.
3	1/5/26	Sherri Chappell	Sta. 337+50 Mainline Relocated US 25	Contrary to plans, install dual pocket lefts in median at STA. 337+50, similar to STA. 352+50. Adjust quantities accordingly.
4	1/5/26	Sherri Chappell	P210	Relocate entrance on Parcel 210 from STA 513+40 LT to STA 517+40 LT. Temporary easement granted by Property Owner Consent and Release
5	1/5/26	Sherri Chappell	P225	Do not disturb fence until work begins on the drainage structure. The fence will be reinstalled when construction is complete on parcel.
6	1/5/26	Sherri Chappell	P231	Remove trees in temporary easement on Parcel 231. If any grade work impacts a root system of a tree outside of easement, remove said tree.
7	1/5/26	Sherri Chappell	P160	Contractor shall coordinate with Parcel 160. During annual Customer Appreciation Week, contractor shall not work on parcel. Additionally, northernmost entrance must remain open at all times for truck deliveries.
8	4/22/26	Blake Combs	P300 Forest Service United States of America.	The forest service has an ongoing project to redevelop their site at this location. The contractor shall take the proposed development into consideration along with the existing conditions to ensure that access is maintained to this site at all times. Contact KYTC District 11 Design Engineer Blake Combs to request PDF plans and CAD files for this development. Phone: (502) 764-0245 Email: Blake.Combs@ky.gov
9	7/13/26	Blake Combs	P337	Contractor shall not disturb the property sign located within temporary easement area on parcel 337. The sign referenced above is located RT of relocated KY 2069 at Approximately STA 42+50 Offset 90' RT (Sheet R116).
10	7/17/26	Blake Combs	P147	Two parking spots on this parcel will be impacted for 6 months.
11	7/17/26	Blake Combs	P320	The contractor shall not disturb the existing curb along the frontage of the parking area.
12	7/17/26	Blake Combs	P138	Entrance and permit for the usage of of adjacent KYTC will be provided per consent & release.
13	7/17/26	Blake Combs	P304	A 15' entrance at Mullins Avenue STA 49+15 and a 30' entrance on Existing US 25 STA 2144+55 shall be constructed per consent & release.
14	7/20/26	Blake Combs	P100	Construct a concrete, commercial entrance to match the existing width of the current entrance at approximately station 301+00 as described in the consent & release.
15	7/20/26	Blake Combs	P130	Construct entrance off KY 229 Connector at approximately RT STA 55+25 as described in the consent & release.

GUARDRAIL DELIVERY VERIFICATION SHEET

Contract Id: _____ **Contractor: _____**

Section Engineer: _____ **District & County: _____**

DESCRIPTION	UNIT	QTY LEAVING PROJECT	QTY RECEIVED@BB YARD
GUARDRAIL (Includes End treatments & crash cushions)	LF	_____	_____
STEEL POSTS	EACH	_____	_____
STEEL BLOCKS	EACH	_____	_____
WOOD OFFSET BLOCKS	EACH	_____	_____
BACK UP PLATES	EACH	_____	_____
CRASH CUSHION	EACH	_____	_____
NUTS, BOLTS, WASHERS	BAG/BCKT	_____	_____
DAMAGED RAIL TO MAINT. FACILITY	LF	_____	_____
DAMAGED POSTS TO MAINT. FACILITY	EACH	_____	_____

****Required Signatures before Leaving Project Site***

Printed Section Engineer's Representative_____ & Date_____

Signature Section Engineer's Representative_____& Date_____

Printed Contractor's Representative_____& Date_____

Signature Contractor's Representative_____& Date_____

****Required Signatures after Arrival at Bailey Bridge Yard (All material on truck must be counted & the quantity received column completed before signatures)***

Printed Bailey Bridge Yard Representative_____ & Date_____

Signature Bailey Bridge Yard Representative_____& Date_____

Printed Contractor's Representative_____& Date_____

Signature Contractor's Representative_____& Date_____

**Payment for the bid item remove guardrail will be based upon the quantities shown in the Bailey Bridge Yard received column. Payment will not be made for guardrail removal until the guardrail verification sheets are electronically submitted to the Section Engineer by the Bailey Bridge Yard Representative.

Completed Form Submitted to Section Engineer Date: _____ By: _____

PART II

SPECIFICATIONS AND STANDARD DRAWINGS

STANDARD SPECIFICATIONS

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 2026* and *Standard Drawings, Edition of 2025.*

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

1I

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

11F

SPECIAL NOTE FOR TURF REINFORCING MAT

1.0 DESCRIPTION. Install turf reinforcement mat at locations specified in the Contract or as the Engineer directs. Section references herein are to the Department's Current Standard Specifications for Road and Bridge Construction.

2.0 MATERIALS.

2.1 Turf Reinforcement Mat (TRM). Use a Turf Reinforcement Mat defined as permanent rolled erosion control product composed of non-degradable synthetic fibers, filaments, nets, wire mesh and/or other elements, processed into a three-dimensional matrix of sufficient thickness and from the Department's List of Approved Materials. Mats must be 100% UV stabilized materials. For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting exclusively. Ensure product labels clearly show the manufacturer or supplier name, style name, and roll number. Ensure labeling, shipment and storage follows ASTM D-4873. The Department will require manufacturer to provide TRMs that are machine constructed web of mechanically or melt bonded nondegradable fibers entangled to form a three dimensional matrix. The Department will require all long term performance property values in table below to be based on non degradable portion of the matting alone. Approved methods include polymer welding, thermal or polymer fusion, or placement of fibers between two high strength biaxially oriented nets mechanically bound by parallel stitching with polyolefin thread. Ensure that mats designated in the plans as Type 4 mats, are not to be manufactured from discontinuous or loosely held together by stitching or glued netting or composites. Type 4 mats shall be composed of geosynthetic matrix that exhibits a very high interlock and reinforcement capacities with both soil and root systems and with high tensile modulus. The Department will require manufacturer to use materials chemically and biologically inert to the natural soil environments conditions. Ensure the blanket is smolder resistant without the use of chemical additives. When stored, maintain the protective wrapping and elevate the mats off the ground to protect them from damage. The Department will not specify these materials for use in heavily acidic coal seam areas or other areas with soil problems that would severally limit vegetation growth.

2.2 Classifications

The basis for selection of the type of mat required will be based on the long term shear stress level of the mat of the channel in question or the degree of slope to protect and will be designated in the contract. The Type 4 mats are to be used at structural backfills protecting critical structures, utility cuts, areas where vehicles may be expected to traverse the mat, channels with large heavy drift, channels with high shear stresses, and where higher factors of safety, very steep slopes and/or durability concerns are needed as determined by project team and designer and will be specified in the plans by designer.

Properties	Type 1	Type 2	Type 3	Type 4
Maximum Slope (H:V)	1:1	1:1	0.5:1	0.5:1
Un-vegetated Shear	≥ 2.0 lbs/ft^2 (≥ 96 Pa)	≥ 2.0 lb/ft2 (≥ 96 Pa)"	≥ 2.0 lb/ft2 (≥ 96 Pa)	≥ 2.0 lb/ft2 (≥ 96 Pa)

11F

Stress[b, c, d] ASTM D6460				
Vegetated Shear Stress [c, d, e, f] ASTM D6460	≥ 6.0 lbs/ft^2 (≥ 287 Pa)	≥ 8.0 lb/ft2 (≥ 383 Pa)	≥ 10.0 lb/ft2 (≥ 479 Pa)	≥ 12.0 lb/ft2 (≥ 575 Pa)
Seedling Emergence [d] ASTM D7322	≥ 250%	≥ 250%	≥ 250%	≥ 250%
MD Material Tensile Strength [d, f] ASTM D6818	≥ 150 lbs/ft (≥ 2.2 kN/m)	≥ 175 lbs/ft (≥ 2.6 kN/m)	≥ 200 lbs/ft (≥ 2.9 kN/m)	≥ 1,500 lbs/ft (≥ 21.9 kN/m)
TD Material Tensile Strength [d, f] ASTM D6818	≥ 150 lbs/ft (≥ 2.2 kN/m)	≥ 175 lbs/ft (≥ 2.6 kN/m)	≥ 200 lbs/ft (≥ 2.9 kN/m)	≥ 1,500 lbs/ft (≥ 21.9 kN/m)
Mass Per Unit Area [d] ASTM D6566	≥ 8.0 oz/yd^2 (≥ 271 g/m^2))	≥ 8.0 oz/yd^2 (≥ 271 g/m2)	≥ 8.0 oz/yd^2 (≥ 271 g/m2)	≥ 8.0 oz/yd2 (≥ 271 g/m2)
Material Thickness [d] ASTM D6525	≥ 0.25 in (≥ 6.35 mm)	≥ 0.25 in (≥ 6.35 mm)	≥ 0.25 in (≥ 6.35 mm)	≥ 0.25 in (≥ 6.35 mm)
UV Stability [c, e] ASTM D4355	≥ 80% @ 500 hrs	≥ 80% @ 500 hrs	≥ 80% @ 1,000 hrs	≥ 90% @ 1,000 hrs

a. For Type 4 mats, property values tested per ASTM D6818 and D6525 are reported as minimum average roll values (MARVs). MARVs are calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any samples taken from quality assurance testing will exceed the value reported.

b. Required minimum shear stress TRM (un-vegetated) can sustain without physical damage or excess erosion (> 12.7 mm (0.5 in.) soil loss during successive, minimum 30 minute flow events in large scale testing.

c. Acceptable large-scale testing protocol may include ASTM D6460, or other independent testing deemed acceptable by the engineer. Large-scale performance testing typically involves limited soil types and vegetative stands, therefore it is recommended that an appropriate factor of safety be used in design and product selection (see Guidance Document for further information).

d. Typical values are calculated as the average value, it yields a 50% degree of confidence that any samples taken from quality assurance testing will exceed the value reported.

e. Required minimum shear stress TRM (fully vegetated) can sustain without physical damage or excess erosion (> 12.7 mm (0.5 in.) soil loss during successive, minimum 30 minute flow events in large scale testing.

f. For TRMs containing degradable components, property values must be obtained on the non-degradable portion of the matting alone.

NOTE: TRMs are typically used in hydraulic applications, such as high flow ditches and channels, steep slopes, stream banks, and shorelines, where erosive forcers may exceed the limits of natural, unreinforced vegetation or in areas where limited vegetation establishment is anticipated.

2.3 Quality Assurance Sampling, Testing, and Acceptance

A) Performance Testing: The Department will require AASHTO's NTPEP index testing. The Department will also require the manufacturer to perform internal MARV testing at a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory for tensile strength, tensile elongation, mass per unit area, and thickness once every 24,000 yds of production or whatever rate is required to ensure

97.7% confidence under ASTM D4439& 4354. The Department will require Full scale testing for slope and channel applications shear stress shall be done under ASTM D 6459, ASTM D 6460-07 procedures.

B) Provide TRM listed on the Department's List of Approved Materials. Prior to inclusion on the LAM, the manufacturer of TRM must meet the physical and performance criteria as outlined in the specification and submit a Letter Certifying compliance of the product under the above ASTM testing procedures and including a copy of report from Full Scale Independent Hydraulics Facility that Fully Vegetated Shear Stress meets shear stress requirements tested under D6459 and D6460-07.

C) Contractors will provide a Letter of Certification from Manufacturer stating the product name, manufacturer, and that the product MARV product unit testing results meets Department criteria. Provide Letters once per project and for each product.

D) Acceptance shall be in accordance with ASTM D-4759 based on testing performed by a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory using Procedure A of ASTM D-4354.

Current mats meeting the above criteria are shown on the Department's List of Approved Materials. Mats that exceed the criteria for KYTC Types 1-4 are available. Contact an erosion control material supplier for more information.

2.4 Fasteners. When the mat manufacturer does not specify a specific fastener, use steel wire U-shaped staples with a minimum diameter of 0.09 inches (11 gauge), a minimum width of one inch and a minimum length of 12 inches. Use a heavier gauge when working in rocky or clay soils and longer lengths in sandy soils as directed by Engineer or Manufacturer's Representative. Provide staples with colored tops when requested by the Engineer.

3.0 CONSTRUCTION., Provide a Manufacturer's Representative on-site to oversee and approve the initial installation of the mat. When requested by the Engineer, provide a letter from the Manufacturer approving the installation. When there is a conflict between the Department's criteria and the Manufacturer's criteria, construct using the more restrictive. The Engineer and Manufacturer's Representative must approve all alternate installation methods prior to execution. Construct according to the Manufacturer's recommendations and the following as minimum installation technique:

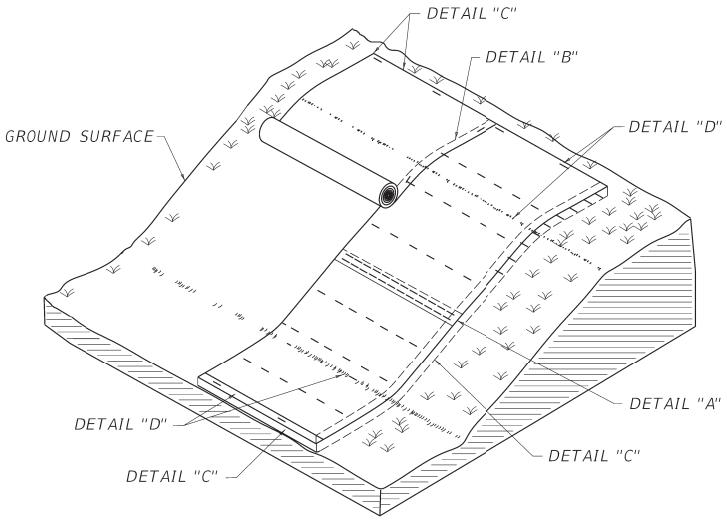
3.1 Site Preparation. Smoothly grade areas to be treated with matting and compact. Remove large
rocks, soil clods, vegetation, roots, and other sharp objects that could keep the mat from intimate contact with subgrade. Prepare seedbed by loosening the top 2 to 3 inch of soil.

3.2 Installation. Install mats according to Standard Drawing Sepias "Turf Mat Channel Installation" and "Turf Mat Slope Installation." Install mats at the specified elevation and alignment. Anchor the mats with staples with a minimum length of 12 inches. Use longer anchors for installations in sandy, loose, or wet soils as directed by the Engineer or Manufacturer's Representative. The mat should be in direct contact with the soil surface. Infill and overfill the mat with a minimum of ½" of soil as directed by the Manufacturer.

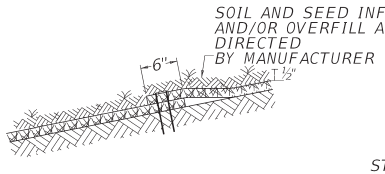
4.0 MEASUREMENT. The Department will measure the quantity of Turf Reinforcement Mat by the square yard of surface covered. The Department will not measure preparation of the bed, providing a Manufacturer's Representative, topsoil, or seeding for payment and will consider them incidental to the Turf Reinforcement Mat. The Department will not measure any reworking of slopes or channels for payment as it is considered corrective work and incidental to the Turf Reinforcement Mat. Seeding and protection will be an incidental item.

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

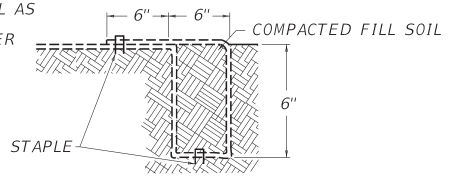
Code	Pay Item	Pay Unit
23274EN11F	Turf Reinforcement Mat 1	Square Yard
23275EN11F	Turf Reinforcement Mat 2	Square Yard
23276EN11F	Turf Reinforcement Mat 3	Square Yard
23277EN11F	Turf Reinforcement Mat 4	Square Yard



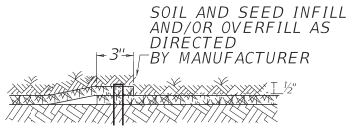
TURF MAT
SLOPE INSTALLATION



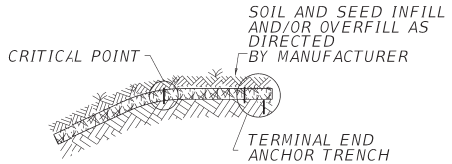
TRANSVERSE OVERLAP
DETAIL "A"

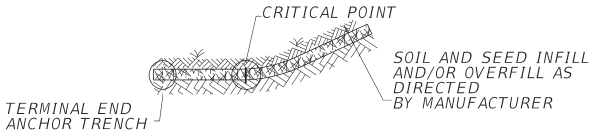


ANCHOR TRENCH
DETAIL "C"



LONGITUDINAL OVERLAP
DETAIL "B"





CRITICAL POINTS
DETAIL "D"

~ NOTES ~

1. CONSTRUCT A 6" X 6" ANCHOR TRENCH AT THE BEGINNING OF THE SLOPE. LINE THE ANCHOR TRENCH WITH TURF REINFORCING MAT LEAVING 12" EXTENDING PAST THE ANCHOR TRENCH. FASTEN THE MAT MATERIAL INTO THE ANCHOR TRENCH ON 12" CENTERS BACKFILL THE TRENCH WITH TOPSOIL AND COMPACT. COVER THE AREA WITH THE REMAINING 12" OF THE MAT'S TERMINAL END LEAVING 6" TO OVERLAP THE TURF REINFORCING MAT. SECURE THE 6" OVERLAP WITH STAPLES ON 12" CENTERS.
2. UNROLL THE MAT DOWN THE SLOPE AND PLACE IN DIRECT CONTACT WITH THE SOIL SURFACE. INSURE THAT THE SOIL SURFACE IS GRADED SMOOTHLY AND DOES NOT CONTAIN IRREGULARITIES.
3. SECURELY FASTEN THE MAT TO THE SOIL BY INSTALLING STAPLES AT A MINIMUM RATE OF 1.5 PER SQ. YD. ANCHORS SHALL BE SELECTED SO THAT THEY HAVE SUFFICIENT GROUND PENETRATION TO RESIST PULLOUT. INCREASE ANCHORING FREQUENCY FOR SITE CONDITIONS (LOOSE, SANDY, OR WET SOILS) AS DIRECTED BY THE ENGINEER AND MANUFACTURER'S REPRESENTATIVE.
4. OVERLAP EDGES OF MATS ACCORDING TO THE LONGITUDINAL AND TRANSVERSE OVERLAP DETAILS. STAPLE LONGITUDINAL OVERLAPS WITH 2 ROWS OF STAPLES STAGGERED AT 4". STAPLE TRANSVERSE OVERLAPS WITH 1 ROW OF STAPLES SPACED AT 12'.
5. CONSTRUCT A 6"X 12" ANCHOR TRENCH AT THE TOE OF THE SLOPE FOLLOWING SIMILAR PROCEDURE DENOTED FOR THE TOP OF THE SLOPE ANCHOR TRENCH.
6. ENSURE THAT THE MAT IS IN DIRECT CONTACT WITH THE SOIL SURFACE WITH NO PROJECTIONS OR PROTRUSIONS.
7. INFILL AND OVERFILL THE MAT WITH A MINIMUM OF ½" TOPSOIL. APPLY SEEDING AND PROTETION AS DIRECTED BY THE MANUFACTURER. USE SEED MIX TYPE 1 AS DEFINED IN SECTION 212.03.03. TOPSOIL IS THE SOIL PROFILE DEFINED TECHNICALLY AS "A" HORIZON BY THE SOIL SCIENCE SOCIETY OF AMERICA. USE LOOSE, FRIABLE TOPSOIL THAT IS FREE OF STONES 1" OR GREATER IN OVERALL DIMENSIONS, ADMIXTURE OF SUBSOIL, REFUSE, STUMPS, ROOTS, BRUSH, WEEDS AND OTHER MATERIALS THAT PREVENT THE FORMATION OF A SUITABLE SEED BED. DO NOT USE TOPSOIL FROM SITES HAVING JOHNSON GRASS, CANADA THISTLE, QUACK GRASS, NODDING THISTLE OR EXCESSIVE AMOUNTS OF WEEDS OR THEIR RHIZOMES.

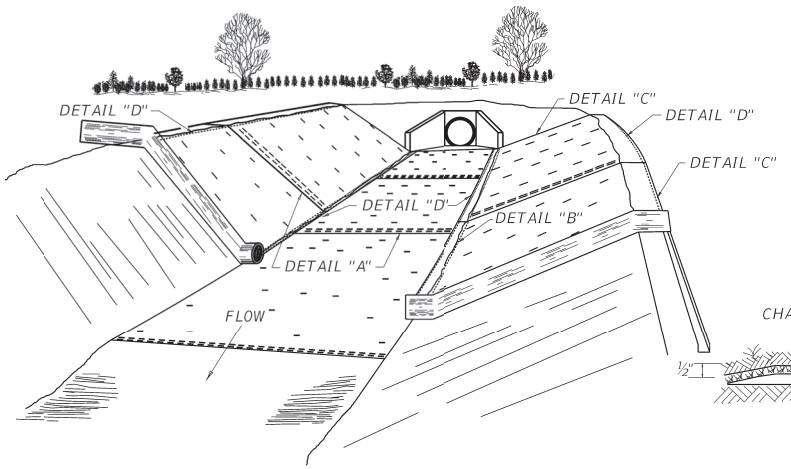
SUBMITTED W. J. Layman 01-24-2023
DIVISION DIRECTOR DATE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY

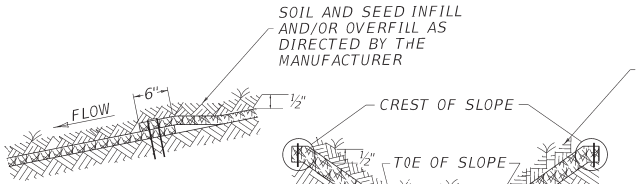
DRAWING TITLE: SEPIA 22 - TURF MAT SLOPE INSTALLATION

ITEM NO. COUNTY OF
SHEET NO.

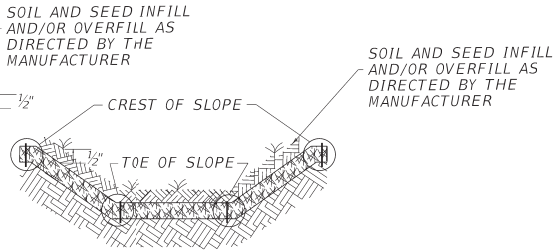
OpenRoads Designer v10.16.2.267 USER: cwillmerdinger FILE NAME: C:\PWWORK\KYTC_CWILLMERDINGER\D2168265\RDI040 - TURF MAT SLOPE INSTALLATION.DGN



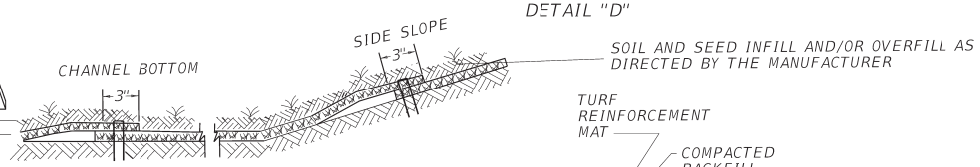
TURF MAT
CHANNEL INSTALLATION



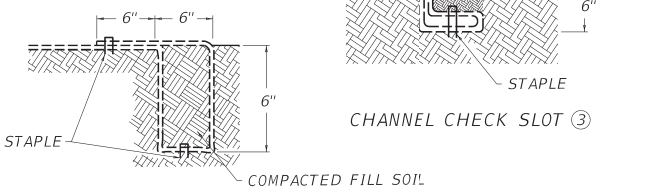
TRANSVERSE OVERLAP
DETAIL "A"



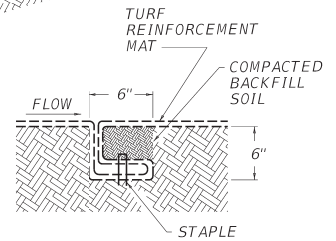
CRITICAL POINTS
DETAIL "D"



LONGITUDINAL OVERLAP
DETAIL "B"



ANCHOR TRENCH
DETAIL "C"



CHANNEL CHECK SLOT ③

~ NOTES ~

1. CONSTRUCT A 6" X 6" ANCHOR TRENCH AT THE UPSTREAM END OF THE CHANNEL. LINE THE ANCHOR TRENCH WITH TURF REINFORCIG MAT LEAVING 12" EXTENDING PAST THE ANCHOR TRENCH. FASTEN THE MAT MATERIAL INTO THE ANCHOR TRENCH ON 12" CENTERS BACKFILL THE TRENCH WITH TOPSOIL AND COMPACT. COVER THE AREA WITH THE REMAINING 12" OF THE MAT'S TERMINAL END LEAVING 6" TO OVERLAP THE TURF REINFORCING MAT. SECURE THE 6" OVERLAP WITH STAPLES ON 12" CENTERS.
2. UNROLL THE MAT PARALLEL TO THE PRIMARY DIRECTION OF WATER FLOW AND PLACE IN DIRECT CONTACT WITH THE SOIL SURFACE. INSURE THAT THE SOIL SURFACE GRADED SMOOTHLY AND DOES NOT CONTAIN IRREGULARITIES.

③ EXCAVATE 6" X 6" CHECK SLOTS EVERY 25' ALONG THE LENGTH OF THE CHANNEL. LINE THE SIDE AND BOTTOM OF THE SLOT WITH THE MAT AND THEN PULL BACK OVER. FASTEN WITH STAPLES ON 12" CENTERS. FILL THE CHECK SLOT WITH TOPSOIL, COMPACT, AND CONTINUE UNROLLING MAT DOWN THE CHANNEL.

4. CONTINUE UNROLLING THE MAT DOWNSTREAM OVER THE COMPACTED SLOT TO THE NEXT CHECK SLOT OR TERMINAL ANCHOR TRENCH. IF MORE THAN ONE SECTION OF MAT, AS SHOWN IN THE TRANSVERSE OVERLAP DETAIL, IS USED OVERLAP UPSTREAM MATS OVER TOP OF THE DOWNSTREAM MAT 6" AND SECURE. IF MATS ARE PLACED PARALLEL TO EACH OTHER ALONG THE CHANNEL, PLACE CHANNEL SECTIONS FIRST, THEN OVERLAP SIDE SLOPE SECTIONS 3" OVER THE CHANNEL SECTIONS AS SHOWN IN THE LONGITUDINAL OVERLAP DETAIL, AND SECURE WITH STAPLES ON 12" CENTERS. PROCEED UP THE SIDE SLOPES IN THE SAME MANNER UNTIL THE TOP OF CHANNEL IS REACHED.
5. SECURE MATS WHILE UNROLLING ON SIDESLOPES AND CHANNEL BOTTOMS WITH STAPLES AT A FREQUENCY THE TABLE INDICATES. USE STAPLES HAVING SUFFICIENT GROUND PENETRATION TO RESIST PULLOUT. INCREASE ANCHORING FREQUENCY AS DIRECTED BY THE ENGINEER AND MANUFACTURER'S REPRESENTATIVE.
6. INFILL AND OVERFILL THE MAT WITH A MINIMUM OF ½" TOPSOIL. APPLY SEEDING AND PROTECTION AS DIRECTED BY THE MANUFACTURER. USE SEED MIX TYPE 1 AS DEFINED IN SECTION 212.03.03. TOPSOIL IS THE SOIL PROFILE DEFINED TECHNICALLY AS "A" HORIZON BY THE SOIL SCIENCE SOCIETY OF AMERICA. USE LOOSE, FRIABLE TOPSOIL THAT IS FREE OF STONES 1" OR GREATER IN OVERALL DIMENSIONS, ADMIXTURE OF SUBSOIL, REFUSE, STUMPS, ROOTS, BRUSH, WEEDS AND OTHER MATERIALS THAT PREVENT THE FORMATION OF A SUITABLE SEED BED. DO NOT USE TOPSOIL FROM SITES HAVING JOHNSON GRASS, CANADA THISTLE, QUACK GRASS, NODDING THISTLE OR EXCESSIVE AMOUNTS OF WEEDS OR THEIR RHIZOMES.

SLOPE GRADE	ANCHORING FREQUENCY
UP TO 2H:1V	1.5 ANCHORS/SQYD
2H:1V TO 1H:1V	2.0 ANCHORS/SQYD
STEEPER THAN 1H:1V AND CHANNEL BOTTOMS	3.0 ANCHORS/SQYD

SUBMITTED W. J. Logan 01-24-2023
DIVISION DIRECTOR DATE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY

DRAWING TITLE: SEPIA 23 - TURF MAT CHANNEL INSTALLATION

ITEM NO. COUNTY OF
SHEET NO.

OpenRoads Designer v10.16.2.267 USER: cwillmerdinger FILE NAME: C:\PWWORK\KYTC_CWILLMERDINGER\D2168266\RDI041 - TURF MAT CHANNEL INSTALLATION.DGN

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).

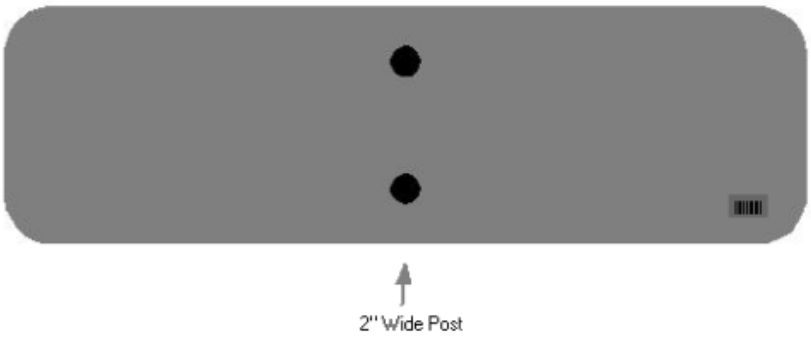
The installation of the permanent sign will be measured in accordance to Section 715.

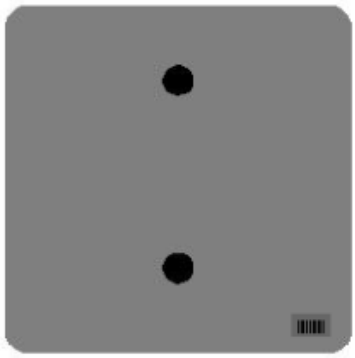
5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

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.

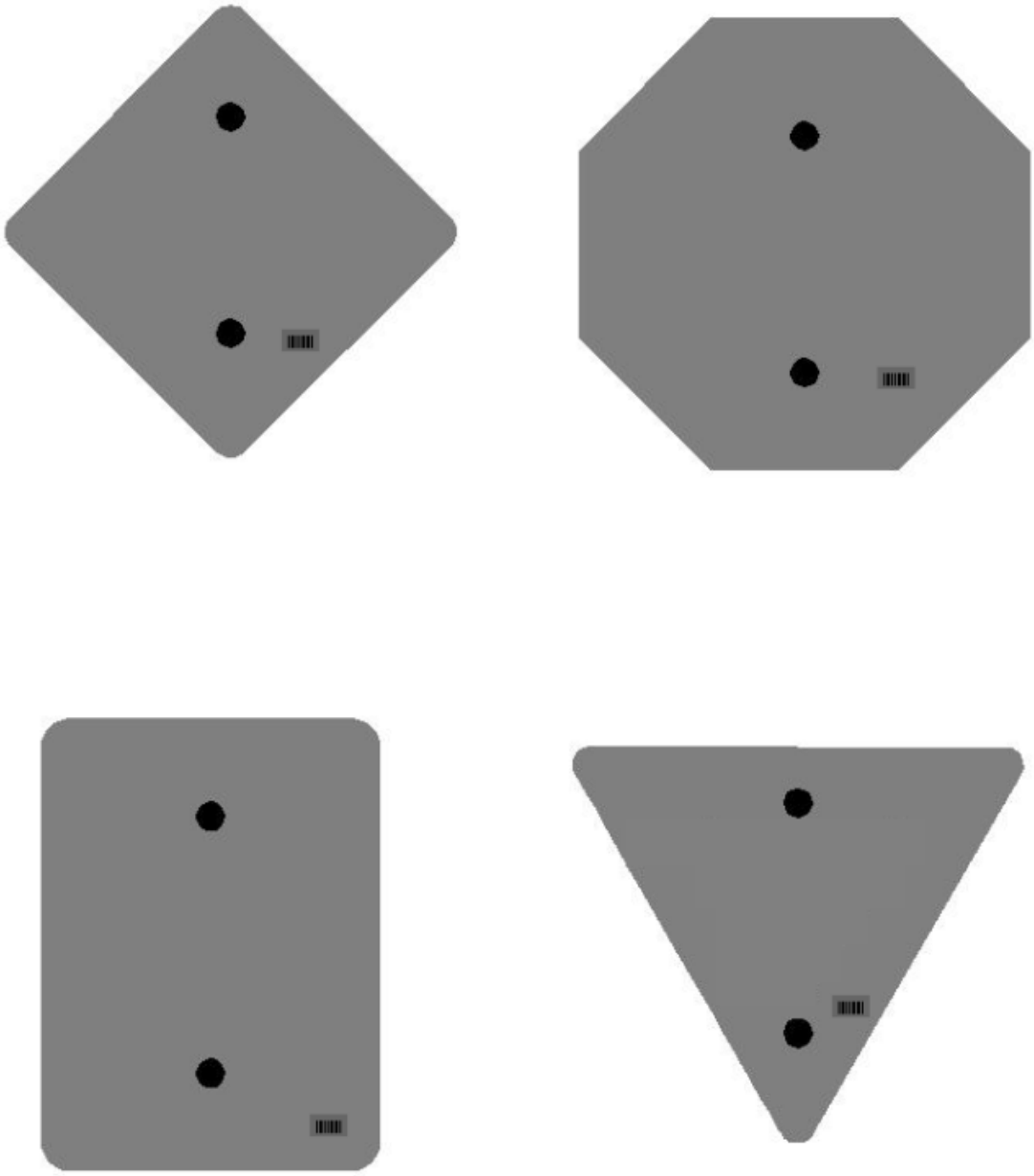
One Sign Post



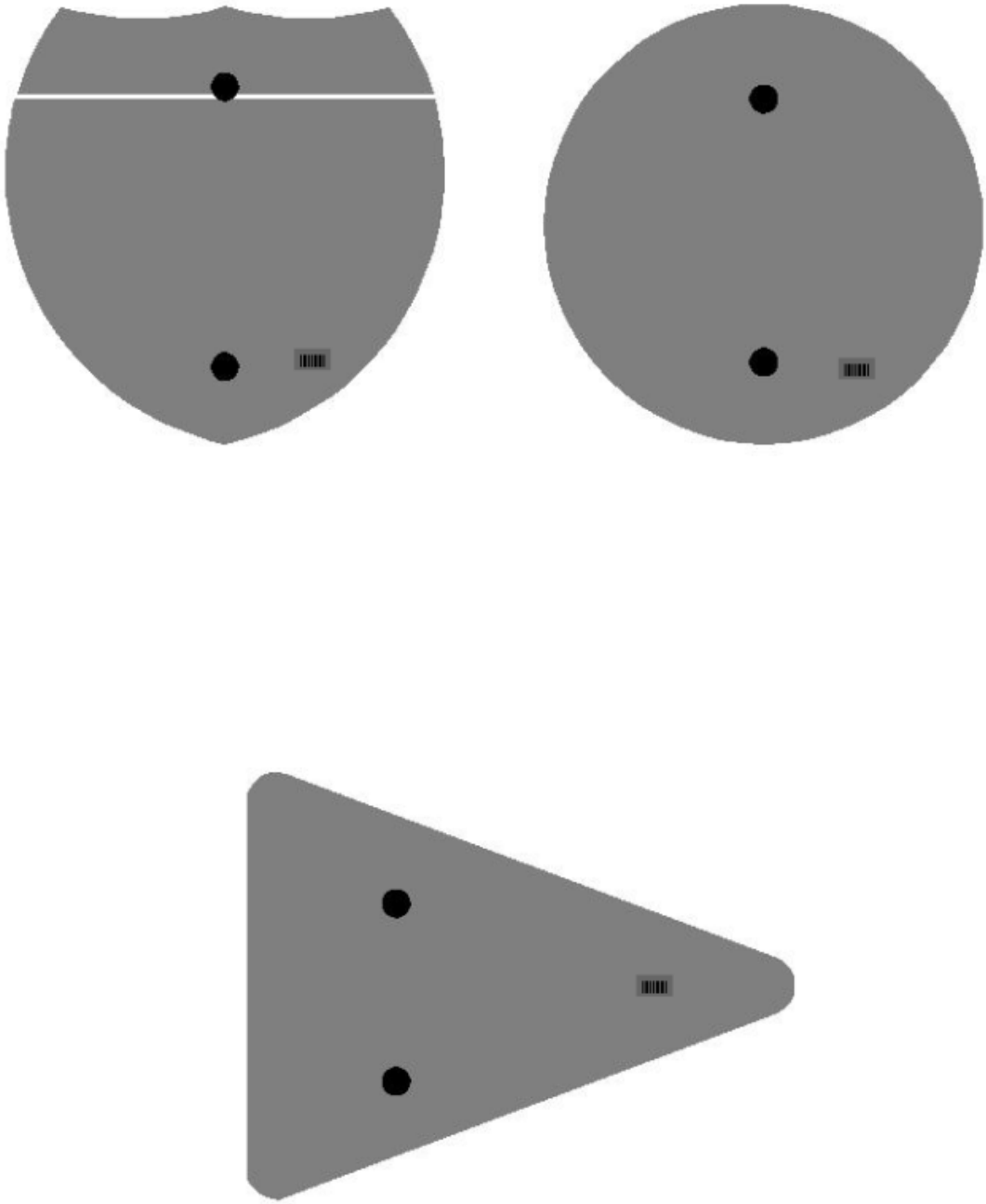




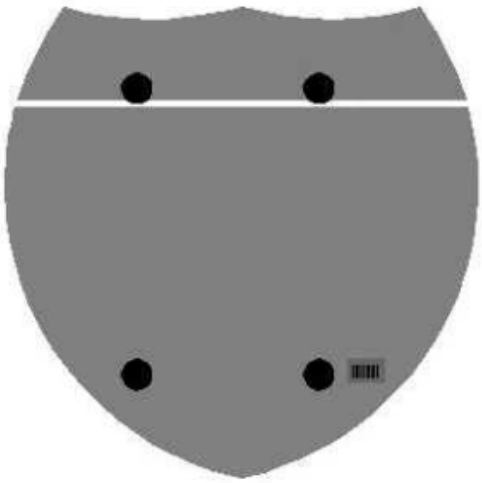
One Sign Post



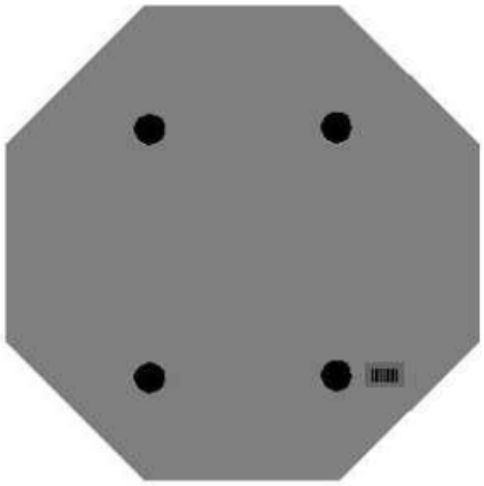
One Sign Post



Double Sign Post



Interstate
Shield

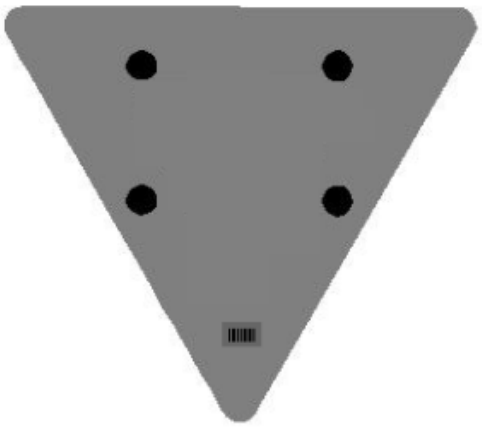


48" Stop

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.

11N

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 ° F (Pa•s) ASTM D 3236	 4.0-10.0	 3.5-10.5	3.0-3.4 10.6-11.0	2.5-2.9 11.1-11.5	2.0-2.4 11.6-12.0	≤1.9 ≥ 12.1
Cone Penetration, 77 ° F ASTM D 5329	 60-100	 57-103	54-56 104-106	51-53 107-109	48-50 110-112	≤ 47 ≥ 113
Flow, 140 ° 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 ° F (%) ASTM D 5329	≥ 30	≥ 28	26-27	24-25	22-23	≤ 21
Tensile Adhesion, 77 ° F (%) ASTM D 5329	≥ 500	≥ 490	480-489	470-479	460-469	≤ 459
Softening Point, ° F AASHTO T 53	≥ 171	≥ 169	166-168	163-165	160-162	≤ 159
Ductility, 77 ° 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 ° 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

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

LABOR AND WAGE REQUIREMENTS
APPLICABLE TO OTHER THAN FEDERAL-AID SYSTEM PROJECTS

I. Application
II. Nondiscrimination of Employees (KRS 344)

I. APPLICATION

1. These contract provisions shall apply to all work performed on the contract by the contractor with his own organization and with the assistance of workmen under his immediate superintendence and to all work performed on the contract by piecework, station work or by subcontract. The contractor's organization shall be construed to include only workmen employed and paid directly by the contractor and equipment owned or rented by him, with or without operators.

2. The contractor shall insert in each of his subcontracts all of the stipulations contained in these Required Provisions and such other stipulations as may be required.

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

II. NONDISCRIMINATION OF EMPLOYEES

AN ACT OF THE KENTUCKY
GENERAL ASSEMBLY TO PREVENT
DISCRIMINATION IN EMPLOYMENT
KRS CHAPTER 344
EFFECTIVE JUNE 16, 1972

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (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

EXECUTIVE BRANCH CODE OF ETHICS

The Executive Branch Code of Ethics created by Kentucky Revised Statutes (KRS) Chapter 11A, effective July 14, 1992, establishes the ethical standards that govern the conduct of all executive branch employees. The Executive Branch Code of Ethics, which states, in part:

> KRS 11A.040 (7) provides:
>
> A present or former public servant listed in KRS 11A.010(9)(a) to (g) shall not, within one (1) year following termination of his or her 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 one (1) year, he or she personally refrains from working on any matter in which he was directly involved during the last thirty-six (36) months of his or her 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 to obtain private benefits.

If you have worked for the executive branch of state government within the past year, 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, 1025 Capital Center Drive, Suite 105, Frankfort, Kentucky 40601; telephone (502) 564-7954.

Revised: March 11, 2025

Kentucky Equal Employment Opportunity Act of 1978

The requirements of the Kentucky Equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) shall apply to this Contract. The apparent low Bidder will be required to submit EEO forms to the Division of Construction Procurement, which will then forward to the Finance and Administration Cabinet for review and approval. No award will become effective until all forms are submitted and EEO/CC has certified compliance. The required EEO forms are as follows:

- EEO-1: Employer Information Report
- Affidavit of Intent to Comply
- Employee Data Sheet
- Subcontractor Report

These forms are available on the Finance and Administration's web page under ***Vendor Information, Standard Attachments and General Terms*** at the following address: **https://www.eProcurement.ky.gov**.

Bidders currently certified as being in compliance by the Finance and Administration Cabinet may submit a copy of their approval letter in lieu of the referenced EEO forms.

For questions or assistance please contact the Finance and Administration Cabinet by email at **finance.contractcompliance@ky.gov** or by phone at 502-564-2874.

EMPLOYEE RIGHTS
UNDER THE FAIR LABOR STANDARDS ACT

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

FEDERAL MINIMUM WAGE
$7.25 PER HOUR
BEGINNING JULY 24, 2009

OVERTIME PAY

At least 1½ times your regular rate of pay for all hours worked over 40 in a workweek.

CHILD LABOR

An employee must be at least **16** years old to work in most non-farm jobs and at least **18** to work in non-farm jobs declared hazardous by the Secretary of Labor.

Youths **14** and **15** years old may work outside school hours in various non-manufacturing, non-mining, non-hazardous jobs under the following conditions:

No more than
- **3** hours on a school day or **18** hours in a school week;
- **8** hours on a non-school day or **40** hours in a non-school week.

Also, work may not begin before **7 a.m.** or end after **7 p.m.**, except from June 1 through Labor Day, when evening hours are extended to **9 p.m.** Different rules apply in agricultural employment.

TIP CREDIT

Employers of "tipped employees" must pay a cash wage of at least $2.13 per hour if they claim a tip credit against their minimum wage obligation. If an employee's tips combined with the employer's cash wage of at least $2.13 per hour do not equal the minimum hourly wage, the employer must make up the difference. Certain other conditions must also be met.

ENFORCEMENT

The Department of Labor may recover back wages either administratively or through court action, for the employees that have been underpaid in violation of the law. Violations may result in civil or criminal action.

Employers may be assessed civil money penalties of up to $1,100 for each willful or repeated violation of the minimum wage or overtime pay provisions of the law and up to $11,000 for each employee who is the subject of a violation of the Act's child labor provisions. In addition, a civil money penalty of up to $50,000 may be assessed for each child labor violation that causes the death or serious injury of any minor employee, and such assessments may be doubled, up to $100,000, when the violations are determined to be willful or repeated. The law also prohibits discriminating against or discharging workers who file a complaint or participate in any proceeding under the Act.

ADDITIONAL INFORMATION

- Certain occupations and establishments are exempt from the minimum wage and/or overtime pay provisions.
- Special provisions apply to workers in American Samoa and the Commonwealth of the Northern Mariana Islands.
- Some state laws provide greater employee protections; employers must comply with both.
- The law requires employers to display this poster where employees can readily see it.
- Employees under 20 years of age may be paid $4.25 per hour during their first 90 consecutive calendar days of employment with an employer.
- Certain full-time students, student learners, apprentices, and workers with disabilities may be paid less than the minimum wage under special certificates issued by the Department of Labor.

For additional information:

1-866-4-USWAGE

(1-866-487-9243) TTY: 1-877-889-5627

WHD U.S. Wage and Hour Division

WWW.WAGEHOUR.DOL.GOV

U.S. Department of Labor | Wage and Hour Division

WHD Publication 1088 (Revised July 2009)

PART IV

BID ITEMS

261517

PROPOSAL BID ITEMS

Report Date 7/29/26

261517

Section: 0001 - PAVEMENT

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE	75,788.00	TON		$	
0020	00020		TRAFFIC BOUND BASE	760.00	TON		$	
0030	00071		CRUSHED AGGREGATE SIZE NO 57	3,484.00	TON		$	
0040	00078		CRUSHED AGGREGATE SIZE NO 2	89,775.00	TON		$	
0050	00100		ASPHALT SEAL AGGREGATE	67.00	TON		$	
0060	00103		ASPHALT SEAL COAT	8.00	TON		$	
0070	00194		LEVELING & WEDGING PG76-22	8,273.00	TON		$	
0080	00214		CL3 ASPH BASE 1.00D PG64-22	327.00	TON		$	
0090	00216		CL3 ASPH BASE 1.00D PG76-22	6,759.00	TON		$	
0100	00217		CL4 ASPH BASE 1.00D PG64-22	478.00	TON		$	
0110	00219		CL4 ASPH BASE 1.00D PG76-22	18,915.00	TON		$	
0120	00221		CL2 ASPH BASE 0.75D PG64-22	2,253.00	TON		$	
0130	00223		CL3 ASPH BASE 0.75D PG64-22	3,279.00	TON		$	
0140	00225		CL3 ASPH BASE 0.75D PG76-22	3,250.00	TON		$	
0150	00296		ASPHALT PRIME COAT	106.00	TON		$	
0160	00301		CL2 ASPH SURF 0.38D PG64-22	1,353.00	TON		$	
0170	00339		CL3 ASPH SURF 0.38D PG64-22	36.00	TON		$	
0180	00342		CL4 ASPH SURF 0.38A PG76-22	8,839.00	TON		$	
0190	00356		ASPHALT MATERIAL FOR TACK	161.00	TON		$	
0200	00387		CL3 ASPH SURF 0.38B PG76-22	2,070.00	TON		$	
0210	00389		CL3 ASPH SURF 0.38D PG76-22	3,320.00	TON		$	
0220	02101		CEM CONC ENT PAVEMENT-8 IN	6,278.00	SQYD		$	
0230	02108		RUBBLIZE PAVEMENT	12,750.00	SQYD		$	
0240	02241		RESHAPING AND COMPACTING	4,677.00	LF		$	
0250	02602		FABRIC-GEOTEXTILE CLASS 1 SHARED USE PATH	130,111.00	SQYD		$	
0260	02603		FABRIC-GEOTEXTILE CLASS 2	18,790.00	SQYD		$	
0270	02608		FABRIC-GEOTEXTILE CLASS 4A	130,111.00	SQYD		$	
0280	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		$	
0290	02677		ASPHALT PAVE MILLING & TEXTURING	1,637.00	TON		$	
0300	08100		CONCRETE-CLASS A	120.00	CUYD		$	
0310	20071EC		JOINT ADHESIVE	74,310.00	LF		$	
0320	21001ES400		CL4 ASPH SURF 0.38D PG64-22	251.00	TON		$	
0330	24785EC		FIBER REINFORCEMENT FOR HMA	30,493.00	TON		$	
0340	24904EC		CL3 ASPH BASE CK PG64-22	7,731.00	TON		$	
0350	24905EC		CL4 ASPH BASE CK PG64-22	22,763.00	TON		$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0360	00080		CRUSHED AGGREGATE SIZE NO 23	18,792.00	TON		$	
0370	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM	1.00	LS		$	
0380	01310		REMOVE PIPE	128.00	LF		$	
0390	01810		STANDARD CURB AND GUTTER	8,485.00	LF		$	

261517

PROPOSAL BID ITEMS

Report Date 7/29/26

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0400	01811		STANDARD CURB AND GUTTER MOD	31,034.00	LF		$	
0410	01812		REMOVE CURB AND GUTTER	830.00	LF		$	
0420	01875		STANDARD HEADER CURB	2,831.00	LF		$	
0430	01923		STANDARD BARRIER MEDIAN TYPE 5	23,885.00	SQYD		$	
0440	01956		CONC TERMINAL SECTION TYPE 1	1.00	EACH		$	
0450	01987		DELINEATOR FOR G/R BI DIRECTIONAL WHITE	9.00	EACH		$	
0460	02001		CURB TO BARRIER WALL TRANS	8.00	EACH		$	
0470	02014		BARRICADE-TYPE III	66.00	EACH		$	
0480	02015		CEMENT CONCRETE ISLAND	335.00	SQYD		$	
0490	02016		REMOVE CONCRETE ISLAND	733.00	SQYD		$	
0500	02091		REMOVE PAVEMENT	4,384.00	SQYD		$	
0510	02157		PAVED DITCH TYPE 1	226.00	SQYD		$	
0520	02159		TEMP DITCH	11,629.00	LF		$	
0530	02160		CLEAN TEMP DITCH	5,815.00	LF		$	
0540	02200		ROADWAY EXCAVATION	174,016.00	CUYD		$	
0550	02242		WATER	872.00	MGAL		$	
0560	02262		FENCE-WOVEN WIRE TYPE 1	1,192.00	LF		$	
0570	02288		SINGLE VEHICULAR WOVEN WIRE GATE	1.00	EACH		$	
0580	02351		G/R-W BEAM-S FACE TL-3	825.00	LF		$	
0590	02360		G/R TERMINAL SECTION NO 1	10.00	EACH		$	
0600	02367		G/R END TREATMENT TYPE 1	1.00	EACH		$	
0610	02381		REMOVE G/R	764.00	LF		$	
0620	02391		G/R END TREATMENT TYPE 4A	3.00	EACH		$	
0630	02403		REMOVE CONCRETE MASONRY	4.30	CUYD		$	
0640	02429		RIGHT-OF-WAY MONUMENT TYPE 1	295.00	EACH		$	
0650	02432		WITNESS POST	12.00	EACH		$	
0660	02483		CHANNEL LINING CLASS II	726.00	TON		$	
0670	02484		CHANNEL LINING CLASS III	595.00	TON		$	
0680	02545		CLEARING AND GRUBBING APPROXIMATELY 105.2 AC	1.00	LS		$	
0690	02555		CONCRETE-CLASS B	3.42	CUYD		$	
0700	02562		TEMPORARY SIGNS	1,450.00	SQFT		$	
0710	02585		EDGE KEY	1,858.00	LF		$	
0720	02603		FABRIC-GEOTEXTILE CLASS 2	85,538.00	SQYD		$	
0730	02607		FABRIC-GEOTEXTILE CLASS 2 FOR PIPE	44,702.00	SQYD	$2.00	$	$89,404.00
0740	02611		HANDRAIL-TYPE A-1	239.00	LF		$	
0750	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		$	
0760	02654		TRUCK MOUNTED ATTENUATOR	4.00	EACH		$	
0770	02671		PORTABLE CHANGEABLE MESSAGE SIGN	10.00	EACH		$	
0780	02690		SAFELOADING	60.70	CUYD		$	
0790	02697		EDGELINE RUMBLE STRIPS	1,400.00	LF		$	
0800	02701		TEMP SILT FENCE	11,629.00	LF		$	
0810	02703		SILT TRAP TYPE A	103.00	EACH		$	
0820	02704		SILT TRAP TYPE B	103.00	EACH		$	
0830	02705		SILT TRAP TYPE C	103.00	EACH		$	
0840	02706		CLEAN SILT TRAP TYPE A	103.00	EACH		$	
0850	02707		CLEAN SILT TRAP TYPE B	103.00	EACH		$	
0860	02708		CLEAN SILT TRAP TYPE C	103.00	EACH		$	
0870	02720		SIDEWALK-4 IN CONCRETE	17,599.00	SQYD		$	

261517

PROPOSAL BID ITEMS

Report Date 7/29/26

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0880	02721		REMOVE CONCRETE SIDEWALK	290.00	SQYD		$	
0890	02726		STAKING	1.00	LS		$	
0900	02731		REMOVE STRUCTURE BRIDGE COMM. DRIVE STA 54+02 TO STA 54+63	1.00	LS		$	
0910	02731		REMOVE STRUCTURE LT STA. 2149+93 TO 2151+10 (RETAINING WALL)	1.00	LS		$	
0920	02731		REMOVE STRUCTURE LT STA. 2151+56 TO 2152+01 (RETAINING WALL)	1.00	LS		$	
0930	02731		REMOVE STRUCTURE STA. 530+00 (5X4X67 RCBC)	1.00	LS		$	
0940	02775		ARROW PANEL	6.00	EACH		$	
0950	02900		INSTALL TEMP CRASH CUSHION	2.00	EACH		$	
0960	03171		CONC BARRIER WALL TYPE 9T	598.00	LF		$	
0970	04793		CONDUIT-1 1/4 IN	80.00	LF		$	
0980	04795		CONDUIT-2 IN	40.00	LF		$	
0990	04820		TRENCHING AND BACKFILLING	110.00	LF		$	
1000	04829		PIEZOELECTRIC SENSOR	4.00	EACH		$	
1010	04830		LOOP WIRE	1,800.00	LF		$	
1020	04895		LOOP SAW SLOT AND FILL	400.00	LF		$	
1030	04953		TEMP RELOCATION OF SIGNAL HEAD	58.00	EACH		$	
1040	05950		EROSION CONTROL BLANKET	16,072.00	SQYD		$	
1050	05952		TEMP MULCH	333,072.00	SQYD		$	
1060	05953		TEMP SEEDING AND PROTECTION	247,961.00	SQYD		$	
1070	05963		INITIAL FERTILIZER	25.60	TON		$	
1080	05964		MAINTENANCE FERTILIZER	15.30	TON		$	
1090	05985		SEEDING AND PROTECTION	495,923.00	SQYD		$	
1100	05992		AGRICULTURAL LIMESTONE	307.40	TON		$	
1110	06510		PAVE STRIPING-TEMP PAINT-4 IN	19,314.00	LF		$	
1120	06511		PAVE STRIPING-TEMP PAINT-6 IN	256,858.00	LF		$	
1130	06513		PAVE STRIPING-TEMP PAINT-12 IN	14,048.00	LF		$	
1140	06514		PAVE STRIPING-PERM PAINT-4 IN	9,657.00	LF		$	
1150	06542		PAVE STRIPING-THERMO-6 IN W	69,510.00	LF		$	
1160	06543		PAVE STRIPING-THERMO-6 IN Y	56,745.00	LF		$	
1170	06547		PAVE STRIPING-THERMO-12 IN Y	62.00	LF		$	
1180	06556		PAVE STRIPING-DUR TY 1-6 IN W	275.00	LF		$	
1190	06557		PAVE STRIPING-DUR TY 1-6 IN Y	275.00	LF		$	
1200	06565		PAVE MARKING-THERMO X-WALK-6 IN	6,656.00	LF		$	
1210	06568		PAVE MARKING-THERMO STOP BAR-24IN	1,615.00	LF		$	
1220	06569		PAVE MARKING-THERMO CROSS-HATCH	2,927.00	SQFT		$	
1230	06572		PAVE MARKING-DOTTED LANE EXTEN	1,624.00	LF		$	
1240	06573		PAVE MARKING-THERMO STR ARROW	1.00	EACH		$	
1250	06574		PAVE MARKING-THERMO CURV ARROW	123.00	EACH		$	
1260	06575		PAVE MARKING-THERMO COMB ARROW	11.00	EACH		$	
1270	06576		PAVE MARKING-THERMO ONLY	2.00	EACH		$	
1280	06600		REMOVE PAVEMENT MARKER TYPE V	459.00	EACH		$	
1290	06610		INLAID PAVEMENT MARKER-MW	747.00	EACH		$	
1300	06611		INLAID PAVEMENT MARKER-MY	414.00	EACH		$	
1310	06612		INLAID PAVEMENT MARKER-BY	138.00	EACH		$	

261517

PROPOSAL BID ITEMS

Report Date 7/29/26

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1320	08100		CONCRETE-CLASS A	118.70	CUYD		$	
1330	10020NS		FUEL ADJUSTMENT	161,845.00	DOLL	$1.00	$	$161,845.00
1340	10030NS		ASPHALT ADJUSTMENT	365,197.00	DOLL	$1.00	$	$365,197.00
1350	20099ES842		PAVE MARK TEMP PAINT STOP BAR	3,230.00	LF		$	
1360	20100ES842		PAVE MARK TEMP PAINT LINE ARROW	396.00	EACH		$	
1370	20359NN		GALVANIZED STEEL CABINET	2.00	EACH		$	
1380	20360ES818		WOOD POST	4.00	EACH		$	
1390	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	2.00	EACH		$	
1400	20458ES403		CENTERLINE RUMBLE STRIPS	700.00	LF		$	
1410	20550ND		SAWCUT PAVEMENT	1,103.00	LF		$	
1420	20911ED		HIGH SLUMP 3000 PSI GROUT	6.30	CUYD		$	
1430	21289ED		LONGITUDINAL EDGE KEY	19,955.00	LF		$	
1440	21417ES717		PAVE MARK THERMO CONE CAP-SOLID YELLOW	207.00	SQFT		$	
1450	21600EN		SHEET PILING	98.00	LF		$	
1460	22520EN		PAVE MARKING-THERMO YIELD BAR-36 IN	102.00	LF		$	
1470	22692NS714		PAVEMENT MARKING-THERMO LETTERS	42.00	EACH		$	
1480	23158ES505		DETECTABLE WARNINGS	3,276.00	SQFT		$	
1490	23274EN11F		TURF REINFORCEMENT MAT 1	3,173.00	SQYD		$	
1500	23475EC		TEMPORARY PIPE-30 IN	14.00	LF		$	
1510	24679ED		PAVE MARK THERMO CHEVRON	222.00	SQFT		$	
1520	24814EC		PIPELINE INSPECTION	30,222.00	LF		$	
1530	24845EC		UTILITY COORDINATION	1.00	LS		$	
1540	26248EC		ELECTRONIC DELIVERY MGMT SYSTEM - AGG	1.00	LS		$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1550	00078		CRUSHED AGGREGATE SIZE NO 2	6.00	TON		$	
1560	00440		ENTRANCE PIPE-15 IN	589.00	LF		$	
1570	00441		ENTRANCE PIPE-18 IN	211.00	LF		$	
1580	00443		ENTRANCE PIPE-24 IN	250.00	LF		$	
1590	00454		ENTRANCE PIPE-30 IN EQUIV	70.00	LF		$	
1600	00461		CULVERT PIPE-15 IN	277.00	LF		$	
1610	00462		CULVERT PIPE-18 IN	310.00	LF		$	
1620	00464		CULVERT PIPE-24 IN	445.00	LF		$	
1630	00468		CULVERT PIPE-36 IN	205.00	LF		$	
1640	00498		CULVERT PIPE-42 IN EQUIV	62.00	LF		$	
1650	00520		STORM SEWER PIPE-12 IN	229.00	LF		$	
1660	00521		STORM SEWER PIPE-15 IN	4,395.00	LF		$	
1670	00522		STORM SEWER PIPE-18 IN	14,931.00	LF		$	
1680	00524		STORM SEWER PIPE-24 IN	5,256.00	LF		$	
1690	00526		STORM SEWER PIPE-30 IN	1,961.00	LF		$	
1700	00528		STORM SEWER PIPE-36 IN	693.00	LF		$	
1710	00529		STORM SEWER PIPE-42 IN	308.00	LF		$	
1720	01000		PERFORATED PIPE-4 IN	36,589.00	LF		$	
1730	01001		PERFORATED PIPE-6 IN	2,517.00	LF		$	
1740	01010		NON-PERFORATED PIPE-4 IN	623.00	LF		$	

261517

PROPOSAL BID ITEMS

Report Date 7/29/26

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1750	01011		NON-PERFORATED PIPE-6 IN	15.00	LF		$	
1760	01024		PERF PIPE HEADWALL TY 2-4 IN	3.00	EACH		$	
1770	01028		PERF PIPE HEADWALL TY 3-4 IN	5.00	EACH		$	
1780	01200		PIPE CULVERT HEADWALL-12 IN	1.00	EACH		$	
1790	01202		PIPE CULVERT HEADWALL-15 IN	15.00	EACH		$	
1800	01204		PIPE CULVERT HEADWALL-18 IN	14.00	EACH		$	
1810	01208		PIPE CULVERT HEADWALL-24 IN	11.00	EACH		$	
1820	01210		PIPE CULVERT HEADWALL-30 IN	4.00	EACH		$	
1830	01212		PIPE CULVERT HEADWALL-36 IN	4.00	EACH		$	
1840	01214		PIPE CULVERT HEADWALL-42 IN	2.00	EACH		$	
1850	01434		SLOPED BOX OUTLET TYPE 1-24 IN	2.00	EACH		$	
1860	01450		S & F BOX INLET-OUTLET-18 IN	3.00	EACH		$	
1870	01452		S & F BOX INLET-OUTLET-30 IN	1.00	EACH		$	
1880	01453		S & F BOX INLET-OUTLET-36 IN	3.00	EACH		$	
1890	01456		CURB BOX INLET TYPE A	210.00	EACH		$	
1900	01480		CURB BOX INLET TYPE B	2.00	EACH		$	
1910	01487		CURB BOX INLET TYPE F	3.00	EACH		$	
1920	01490		DROP BOX INLET TYPE 1	1.00	EACH		$	
1930	01496		DROP BOX INLET TYPE 3	35.00	EACH		$	
1940	01529		DROP BOX INLET TYPE 6D	3.00	EACH		$	
1950	01544		DROP BOX INLET TYPE 11	20.00	EACH		$	
1960	01550		DROP BOX INLET TYPE 12A	50.00	LF		$	
1970	01559		DROP BOX INLET TYPE 13G	12.00	EACH		$	
1980	01568		DROP BOX INLET TYPE 13S	3.00	EACH		$	
1990	01577		DROP BOX INLET TYPE 14	7.00	EACH		$	
2000	01584		CAP DROP BOX INLET	1.00	EACH		$	
2010	01587		DROP BOX INLET TYPE 16S	1.00	EACH		$	
2020	01634		CAP CURB BOX INLET	8.00	EACH		$	
2030	01642		JUNCTION BOX-18 IN	2.00	EACH		$	
2040	01650		JUNCTION BOX	22.00	EACH		$	
2050	01756		MANHOLE TYPE A	20.00	EACH		$	
2060	01767		MANHOLE TYPE C	11.00	EACH		$	
2070	01791		ADJUST MANHOLE FRAME TO GRADE	2.00	EACH		$	
2080	21880NN		METAL END SECTION TY 3-42 IN (EQUIV)	2.00	EACH		$	
2090	22581EN		ENTRANCE PIPE-36 IN	30.00	LF		$	

Section: 0004 - COMMERCIAL DRIVE BRIDGE OVER WHITLEY BRANCH - DWG NO 29044

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2100	02231		STRUCTURE GRANULAR BACKFILL	631.00	CUYD		$	
2110	03299		ARMORED EDGE FOR CONCRETE	155.90	LF		$	
2120	08002		STRUCTURE EXCAV-SOLID ROCK	347.00	CUYD		$	
2130	08003		FOUNDATION PREPARATION	1.00	LS		$	
2140	08019		CYCLOPEAN STONE RIP RAP	122.00	TON		$	
2150	08100		CONCRETE-CLASS A	348.00	CUYD		$	
2160	08104		CONCRETE-CLASS AA	113.40	CUYD		$	
2170	08150		STEEL REINFORCEMENT	27,201.00	LB		$	
2180	08151		STEEL REINFORCEMENT-EPOXY COATED	24,667.00	LB		$	

261517

PROPOSAL BID ITEMS

Report Date 7/29/26

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2190	08500		APPROACH SLAB	142.00	SQYD		$	
2200	08669		PRECAST PC BOX BEAM SB21	306.00	LF		$	
2210	23378EC		CONCRETE SEALING	6,481.00	SQFT		$	
2220	25028ED		RAIL SYSTEM SINGLE SLOPE - 40 IN	106.40	LF		$	
2230	26233EC		MOBILIZATION FOR CONCRETE SURF TREATMENT	1.00	LS		$	

Section: 0005 - RELOCATED US 25 10' X 7' RCBC STA. 309+71.4 - DWG NO 29045

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2240	02223		GRANULAR EMBANKMENT	90.00	CUYD		$	
2250	02403		REMOVE CONCRETE MASONRY	20.00	CUYD		$	
2260	02602		FABRIC-GEOTEXTILE CLASS 1	119.00	SQYD		$	
2270	08002		STRUCTURE EXCAV-SOLID ROCK	5.00	CUYD		$	
2280	08003		FOUNDATION PREPARATION	1.00	LS		$	
2290	08100		CONCRETE-CLASS A	67.80	CUYD		$	
2300	08150		STEEL REINFORCEMENT	9,779.00	LB		$	

Section: 0006 - RELOCATED US 25 4' X 4' RCBC STA. 530+52 - DWG NO 29046

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2310	08002		STRUCTURE EXCAV-SOLID ROCK	5.00	CUYD		$	
2320	08003		FOUNDATION PREPARATION	1.00	LS		$	
2330	08100		CONCRETE-CLASS A	112.00	CUYD		$	
2340	08150		STEEL REINFORCEMENT	12,450.00	LB		$	

Section: 0007 - RELOCATED US 25 BRIDGE OVER WHITLEY BRANCH - DWG NO 29047

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2350	02231		STRUCTURE GRANULAR BACKFILL	614.00	CUYD		$	
2360	03299		ARMORED EDGE FOR CONCRETE	412.00	LF		$	
2370	08003		FOUNDATION PREPARATION	1.00	LS		$	
2380	08019		CYCLOPEAN STONE RIP RAP	1,336.00	TON		$	
2390	08033		TEST PILES	94.00	LF		$	
2400	08046		PILES-STEEL HP12X53	408.00	LF		$	
2410	08094		PILE POINTS-12 IN	26.00	EACH		$	
2420	08100		CONCRETE-CLASS A 10'X7' RCBC EXTENSION	77.60	CUYD		$	
2430	08104		CONCRETE-CLASS AA	347.50	CUYD		$	
2440	08151		STEEL REINFORCEMENT-EPOXY COATED	86,157.00	LB		$	
2450	08500		APPROACH SLAB	378.00	SQYD		$	
2460	08633		PRECAST PC I BEAM TYPE 3	810.00	LF		$	
2470	23378EC		CONCRETE SEALING	12,211.00	SQFT		$	
2480	25028ED		RAIL SYSTEM SINGLE SLOPE - 40 IN	166.00	LF		$	
2490	26233EC		MOBILIZATION FOR CONCRETE SURF TREATMENT	1.00	LS		$	

261517

PROPOSAL BID ITEMS

Report Date 7/29/26

Section: 0008 - UTILITIES

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2500	02460		REMOVE TREES OR STUMPS	24.00	EACH		$	
2510	14003		W CAP EXISTING MAIN	52.00	EACH		$	
2520	14006		W ENCASEMENT STEEL BORED RANGE 1 6 INCH	127.00	LF		$	
2530	14008		W ENCASEMENT STEEL BORED RANGE 3 12 INCH	727.00	LF		$	
2540	14009		W ENCASEMENT STEEL BORED RANGE 4 16 INCH	150.00	LF		$	
2550	14009		W ENCASEMENT STEEL BORED RANGE 4 18 INCH	110.00	LF		$	
2560	14010		W ENCASEMENT STEEL BORED RANGE 5 24 INCH	422.00	LF		$	
2570	14014		W ENCASEMENT STEEL OPEN CUT RANGE 3 12 INCH	165.00	LF		$	
2580	14016		W ENCASEMENT STEEL OPEN CUT RANGE 5 24 INCH	450.00	LF		$	
2590	14019		W FIRE HYDRANT ASSEMBLY	34.00	EACH		$	
2600	14022		W FLUSH HYDRANT ASSEMBLY	3.00	EACH		$	
2610	14025		W METER 1 INCH	7.00	EACH		$	
2620	14026		W METER 1-1/2 INCH	1.00	EACH		$	
2630	14027		W METER 2 INCH	1.00	EACH		$	
2640	14028		W METER 3/4 INCH	77.00	EACH		$	
2650	14032		W METER/FIRE SERVICE COMBO VAULT FIRE PROTECTION VAULT	1.00	EACH		$	
2660	14036		W PIPE DUCTILE IRON 06 INCH	4,205.00	LF		$	
2670	14037		W PIPE DUCTILE IRON 08 INCH	370.00	LF		$	
2680	14039		W PIPE DUCTILE IRON 12 INCH	11,419.00	LF		$	
2690	14056		W PIPE PVC 02 INCH	640.00	LF		$	
2700	14057		W PIPE PVC 03 INCH	730.00	LF		$	
2710	14059		W PIPE PVC 06 INCH	520.00	LF		$	
2720	14061		W PIPE PVC 10 INCH	180.00	LF		$	
2730	14067		W PIPE POLYETHYLENE/PLASTIC 03 INCH	85.00	LF		$	
2740	14077		W SERV PE/PLST LONG SIDE 1 IN	3.00	EACH		$	
2750	14078		W SERV PE/PLST LONG SIDE 1-1/2 IN	1.00	EACH		$	
2760	14080		W SERV PE/PLST LONG SIDE 3/4 IN	28.00	EACH		$	
2770	14082		W SERV PE/PLST SHORT SIDE 1 IN	4.00	EACH		$	
2780	14084		W SERV PE/PLST SHORT SIDE 2 IN	1.00	EACH		$	
2790	14085		W SERV PE/PLST SHORT SIDE 3/4 IN	49.00	EACH		$	
2800	14086		W SERVICE SPECIAL SHORT SIDE 3 INCH	1.00	EACH		$	
2810	14089		W TAPPING SLEEVE AND VALVE SIZE 1 2 INCH	1.00	EACH		$	
2820	14089		W TAPPING SLEEVE AND VALVE SIZE 1 3 INCH	2.00	EACH		$	
2830	14089		W TAPPING SLEEVE AND VALVE SIZE 1 6 INCH	10.00	EACH		$	
2840	14089		W TAPPING SLEEVE AND VALVE SIZE 1 8 INCH	2.00	EACH		$	
2850	14090		W TAPPING SLEEVE AND VALVE SIZE 2 12 INCH	14.00	EACH		$	

261517

PROPOSAL BID ITEMS

Report Date 7/29/26

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2860	14091		W TIE-IN 02 INCH	7.00	EACH		$	
2870	14092		W TIE-IN 03 INCH	3.00	EACH		$	
2880	14094		W TIE-IN 06 INCH	21.00	EACH		$	
2890	14095		W TIE-IN 08 INCH	3.00	EACH		$	
2900	14096		W TIE-IN 10 INCH	2.00	EACH		$	
2910	14097		W TIE-IN 12 INCH	18.00	EACH		$	
2920	14102		W VALVE 02 INCH	10.00	EACH		$	
2930	14103		W VALVE 03 INCH	3.00	EACH		$	
2940	14105		W VALVE 06 INCH	27.00	EACH		$	
2950	14106		W VALVE 08 INCH	1.00	EACH		$	
2960	14107		W VALVE 10 INCH	1.00	EACH		$	
2970	14108		W VALVE 12 INCH	37.00	EACH		$	
2980	14126		W ENCASEMENT SPECIAL 6 INCH HDPE CASING - DIRECTIONAL BORE	65.00	LF		$	
2990	14131		W METER SPECIAL 3 INCH	1.00	EACH		$	
3000	15017		S ENCASEMENT STEEL BORED RANGE 4 16 INCH	769.00	LF		$	
3010	15017		S ENCASEMENT STEEL BORED RANGE 4 18 INCH	85.00	LF		$	
3020	15018		S ENCASEMENT STEEL BORED RANGE 5 24 INCH	220.00	LF		$	
3030	15019		S ENCASEMENT STEEL BORED RANGE 6 30 INCH	130.00	LF		$	
3040	15019		S ENCASEMENT STEEL BORED RANGE 6 36 INCH	50.00	LF		$	
3050	15023		S ENCASEMENT STEEL OPEN CUT RANGE 4 16 INCH	298.00	LF		$	
3060	15023		S ENCASEMENT STEEL OPEN CUT RANGE 4 18 INCH	150.00	LF		$	
3070	15024		S ENCASEMENT STEEL OPEN CUT RANGE 5 24 INCH	594.00	LF		$	
3080	15026		S FORCE MAIN AIR RLS/VAC VLV 02 IN	5.00	EACH		$	
3090	15059		S FORCE MAIN PVC 04 INCH	545.00	LF		$	
3100	15061		S FORCE MAIN PVC 08 INCH	1,695.00	LF		$	
3110	15063		S FORCE MAIN PVC 12 INCH	3,115.00	LF		$	
3120	15073		S FORCE MAIN TIE-IN 04 INCH	3.00	EACH		$	
3130	15075		S FORCE MAIN TIE-IN 08 INCH	8.00	EACH		$	
3140	15077		S FORCE MAIN TIE-IN 12 INCH	4.00	EACH		$	
3150	15086		S LATERAL CLEANOUT	75.00	EACH		$	
3160	15091		S LATERAL SPECIAL RECONNECT EXISTING LATERAL	75.00	EACH		$	
3170	15092		S MANHOLE	89.00	EACH		$	
3180	15092		S MANHOLE 6 FOOT	6.00	EACH		$	
3190	15093		S MANHOLE ABANDON/REMOVE	61.00	EACH		$	
3200	15099		S MANHOLE TAP EXISTING 8-10 INCH	3.00	EACH		$	
3210	15112		S PIPE PVC 08 INCH	5,415.00	LF		$	
3220	15113		S PIPE PVC 10 INCH	2,765.00	LF		$	
3230	15114		S PIPE PVC 12 INCH	1,040.00	LF		$	
3240	15118		S PIPE SPECIAL 4 INCH PVC GRAVITY SEWER LATERAL	2,000.00	LF		$	

PROPOSAL BID ITEMS

261517

Report Date 7/29/26

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3250	15118		S PIPE SPECIAL PVC 18 INCH	3,875.00	LF		$	
3260	15119		S PUMP STATION	1.00	EACH		$	
3270	15137		S PIPE PVC 15 INCH	220.00	LF		$	
3280	15138		S PIPE PVC 6 INCH GRAVITY SEWER LATERAL	2,000.00	LF		$	
3290	20418ED		REMOVE & RELOCATE SIGNS	8.00	EACH		$	
3300	21213ED		CONCRETE PAVING REPLACEMENT	680.00	LF		$	
3310	21810NN		DEAD CAP	15.00	EACH		$	
3320	23967EC		ASPHALT DRIVEWAY/PARKING LOT REPLACEMENT	7,275.00	LF		$	
3330	24441EC		GRAVEL REPLACEMENT DRIVEWAYS	985.00	LF		$	
3340	24466EN		FENCE-SPECIAL FENCE AND GATE FOR PUMP STATION	100.00	LF		$	

Section: 0009 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3350	06406		SBM ALUM SHEET SIGNS .080 IN	1,387.00	SQFT		$	
3360	06407		SBM ALUM SHEET SIGNS .125 IN	239.00	SQFT		$	
3370	06410		STEEL POST TYPE 1	1,698.00	LF		$	
3380	06490		CLASS A CONCRETE FOR SIGNS	10.50	CUYD		$	
3390	21134ND		REMOVE-STORE AND REINSTALL SIGN	2.00	EACH		$	
3400	21373ND		REMOVE SIGN	12.00	EACH		$	
3410	21596ND		GMSS TYPE D	48.00	EACH		$	
3420	24631EC		BARCODE SIGN INVENTORY	308.00	EACH		$	

Section: 0010 - SIGNAL

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3430	04780		FUSED CONNECTOR KIT	89.00	EACH		$	
3440	04811		ELECTRICAL JUNCTION BOX TYPE B	4.00	EACH		$	
3450	04820		TRENCHING AND BACKFILLING	690.00	LF		$	
3460	04845		CABLE-NO. 14/7C	18,600.00	LF		$	
3470	04881		MAST ARM POLE	1.00	EACH		$	
3480	04886		MESSENGER-15400 LB	2,690.00	LF		$	
3490	04892		MESSENGER-26900 LB	775.00	LF		$	
3500	04932		INSTALL STEEL STRAIN POLE	26.00	EACH		$	
3510	04953		TEMP RELOCATION OF SIGNAL HEAD	44.00	EACH		$	
3520	06472		INSTALL SPAN MOUNTED SIGN	23.00	EACH		$	
3530	20093NS835		INSTALL PEDESTRIAN HEAD-LED	39.00	EACH		$	
3540	20188NS835		INSTALL LED SIGNAL-3 SECTION	58.00	EACH		$	
3550	20266ES835		INSTALL LED SIGNAL- 4 SECTION	18.00	EACH		$	
3560	20390NS835		INSTALL COORDINATING UNIT	1.00	EACH		$	
3570	21543EN		BORE AND JACK CONDUIT	140.00	LF		$	
3580	21743NN		INSTALL PEDESTRIAN DETECTOR	42.00	EACH		$	
3590	23068NN		REMOVE & REINSTALL COORDINATING UNIT	5.00	EACH		$	

PROPOSAL BID ITEMS

261517

Report Date 7/29/26

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3600	23157EN		TRAFFIC SIGNAL POLE BASE	125.00	CUYD		$	
3610	23222EC		INSTALL SIGNAL PEDESTAL	25.00	EACH		$	
3620	24528ED		TETHER WIRE	140.00	LF		$	
3630	24900EC		PVC CONDUIT-1 1/4 IN-SCHEDULE 80	330.00	LF		$	
3640	24901EC		PVC CONDUIT-2 IN-SCHEDULE 80	790.00	LF		$	
3650	24908EC		INSTALL SIGNAL CONTROLLER-TY ATC	6.00	EACH		$	
3660	24955ED		REMOVE SIGNAL EQUIPMENT	6.00	EACH		$	
3670	26119EC		INSTALL RADAR PRESENCE DETECTOR TYPE A	24.00	EACH		$	
3680	26120EC		INSTALL RADAR ADVANCE DETECTOR TYPE B	2.00	EACH		$	
3690	26169EC		INSTALL MAST ARM DAMPENER	1.00	EACH		$	
3700	26246EC		INSTALL SOLAR SCHOOL FLASHER ASSEMBLY	2.00	EACH		$	

Section: 0011 - MOBILIZATION / DEMOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3710	02568		MOBILIZATION	1.00	LS		$	
3720	02569		DEMOBILIZATION	1.00	LS		$	