



Andy Beshear
GOVERNOR

TRANSPORTATION CABINET

200 Mero Street
Frankfort, Kentucky 40601

Jim Gray
SECRETARY

October 13, 2023

CALL NO. 102
CONTRACT ID NO. 231341
ADDENDUM # 1

Subject: Fayette County, NH 2681 (037)
Letting October 26, 2023

Revised - Special Notes Pg.69-73, 110-114, & 212-213 of 302
Add - Special Note Pg. 213A-213F of 302
Revise - Proposal Bid Items Pg. 292-302 of 302
Omit - Proposal Pages Pg. 74-91 of 301
Add - Traffic Loop Notes Pg. 1-35 of 35
Revise - Plan Sheet R2M

Proposal revisions are available at <http://transportation.ky.gov/Construction-Procurement/>.

If you have any questions, please contact us at 502-564-3500.

Sincerely,

Rachel Mills,

A handwritten signature in black ink that reads "Rachel Mills".

Rachel Mills, P.E.
Director
Division of Construction Procurement

RM:ce
Enclosures

SPECIAL NOTE FOR NON-DESTRUCTIVE TESTING OF DRILLED SHAFTS

Fayette County

Item No. 7-00113.02

KY 4 Bridge over Norfolk Southern Railroad - Drawing No. 27061

1.0 DESCRIPTION

Crosshole Sonic Logging (CSL) is a nondestructive method to test the integrity of drilled shafts. The Contractor will be responsible for supplying all equipment and materials necessary to perform this testing, and obtaining the services of a CSL Testing Firm using personnel experienced with CSL testing and approved by the Engineer to perform the testing.

- 1.1 The CSL tests must either be performed by or under the supervision of a responsible licensed professional engineer with:
- a minimum of three (3) years experience performing CSL tests, and
 - experience performing CSL tests on a minimum of three (3) past projects with a scope and complexity similar to this project including a minimum of 60 drilled shafts in the past three (3) years.

If the responsible professional engineer does not perform the testing, then the responsible field technician who does perform the testing must meet the same experience requirements.

- 1.2 Preliminary Submittal - At least 21 calendar days before beginning drilled shaft construction, submit a technical proposal prepared by the CSL Testing Firm that documents the personnel's experience and addresses the testing procedures. Experience documentation should include resumes, references, certifications, project lists, experience descriptions and details, etc. Within 10 working days, the Engineer will review the proposal and report to the Contractor whether the CSL Testing Firm and personnel are approved and the proposal is acceptable.

- 1.3 The Contractor will be responsible for providing:
- a. access tubes which will be used for CSL testing of the drilled shafts;
 - b. watertight shoes, watertight caps, and non-shrink grout;
 - c. suitable working space and access to every shaft;
 - d. a reliable 600 watt (minimum) generator; and
 - e. any other equipment or materials necessary to accomplish the testing.

Table 1 - Minimum Number of Access Tubes and CSL Logs			
Shaft Diameter (inches)	Number of Tubes	Diagonal Logs	Perimeter Logs
30 to 36	3	NA	3
42 to 54	4	2	4
60 to 78	6	3	6
84 to 96	8	4	8

2.0 MATERIALS

- 2.1 Supply the number of access tubes shown in the plans or in Table 1. Provide access tubes meeting the requirements below. The Engineer will accept access tubes based on visual inspection and certification that the steel pipe meets the requirements below:
- a. 2.0 inch ID schedule 40 steel pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S;
 - b. contains round, regular internal diameters free of defects or obstructions, including any at pipe joints;
 - c. capable of permitting the free, unobstructed passage of a source and receiver probes; and
 - d. watertight and free from corrosion with clean internal and external faces to ensure passage of the probes and a good bond between the concrete and the tubes.
- 2.2 Provide watertight shoes on the bottom and removable watertight caps on the top of the tubes.
- 2.3 Provide non-shrink grout to fill the access tubes and any cored holes at the completion of the CSL tests. Use grout conforming to Section 601.03.03 of the Standard Specifications.

3.0 CONSTRUCTION

- 3.1 Access Tube Installation
- a. Install access tubes equally spaced around the perimeter of each of the drilled shafts.
 - b. Securely attach the tubes to the longitudinal reinforcement. Wire-tie the tubes a minimum of every 3 feet so they will stay in position during placement of rebar and concrete. Place the tubes so they will be parallel with each other and as near to vertical as possible in the finished shaft. Even moderate bending of the tubes will result in large regional variations in the data.
 - c. Place the tubes from 6 inches above the shaft tip to at least 3 feet above the top of shaft and at least 2 feet above ground level or top of casing. Under no circumstances may the tubes be allowed to come to rest on the bottom of the excavation.
 - d. Ensure that any joints in the tubes are watertight.
 - e. During placement of the reinforcement cage, exercise care so that the tubes will not be damaged to the extent that would prevent test probes from passing through them.
 - f. After placing the reinforcing cage and before beginning concrete placement, fill the tubes with clean potable water and cap or seal the tube tops to keep debris out of the tubes. Replace the watertight caps immediately after filling the tubes with water.
 - g. Before placing concrete, investigate at least one tube per shaft to make sure that there are no bends, crimps, obstructions or other impediments to the free passage of the testing probes.
 - h. During removal of the caps from the tubes, exercise care so as not to apply excess torque, hammering, or other stresses which could break the bond between the tubes and concrete.

- i. After concrete placement and before the beginning of CSL testing, inspect the access tubes and report any access tubes that the test probes cannot pass through to the Engineer. The Engineer will make an evaluation to determine if the CSL testing can be successfully performed without the tube(s); the Engineer may require the contractor to, at its own expense, replace one or more tubes with 2-inch diameter holes cored through the concrete for the entire length of the shaft, excluding the bottom 6 inches. Unless directed otherwise by the Engineer, locate core holes approximately 6 inches inside the reinforcement such that it does not damage the reinforcement. For each core hole drilled, record a log with descriptions of inclusions and voids in the cored holes and submit a copy of the log to the Engineer. Preserve the cores, identify as to location and make available for inspection by the Engineer.

- 3.2 Grouting - After completion of the CSL testing and evaluation of results, and only after being directed to do so by the Engineer, remove the water from the access tubes and any cored holes, completely fill the tubes and holes with approved grout. After grouting, cut the tubes flush with the tops of the drilled shafts.

4.0 TESTING AND REPORTING

The Engineer may elect to reduce the amount of testing and will pay only for the authorized quantities.

- 4.1 Testing
 - a. Perform CSL testing according to ASTM D6760, "Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing".
 - b. Provide access to the top of the shaft for testing personnel and equipment.
 - c. Perform CSL testing in accordance with generally accepted CSL Testing methods.
 - d. Obtain the minimum number of CSL logs shown in Table 1 unless otherwise directed by the Engineer.
 - e. Perform CSL testing on all completed shafts designated for testing by the Engineer, after the shaft concrete has cured at least 48 hours. Additional curing time may be necessary, depending on the concrete admixtures that are used.
- 4.2 Test Reports - Submit a test report prepared by the CSL Testing Firm and signed by the responsible professional engineer which, as a minimum, contains:
 - a. Pier No., Plan Shaft No., Station, Offset, and Top of Shaft Elevation;
 - b. Schematic showing a plan view of the access tube locations;
 - c. CSL logs presented for each tube pair tested with any defect zones indicated on the logs and discussed in the report as appropriate;
 - d. Analyses of initial pulse arrival time versus depth or velocity versus depth if requested by the Engineer; and
 - e. Analyses of pulse energy/amplitude versus depth.
- 4.3 Independent Comparison Tests - Consultants acting on behalf of the Department may perform independent comparison tests on the shafts tested by the Contractor's CSL Testing Firm.

5.0 EVALUATION OF TEST RESULTS

- 5.1** Allow direct communication between the CSL Testing Firm and the Department.
- 5.2** The Engineer will evaluate the CSL test results in the test report to determine whether or not the drilled shaft integrity is acceptable. Within 5 working days after receiving a test report, the Engineer will report to the Contractor whether the construction is acceptable or additional analyses are needed.
- 5.3** The Engineer will not require the Contractor to wait for CSL testing and evaluation to continue drilled shaft construction. However, if the CSL tests indicate that the integrity of any drilled shaft is questionable, the Engineer may direct the Contractor to suspend drilled shaft operations until the problem is resolved.
- 5.4** Continue with construction of the structure above the drilled shafts only after receiving written approval to do so, based on evaluation of the CSL test results.
- 5.5** If the CSL records are complex or inconclusive, the Engineer may require additional testing (such as Angled CSL, Crosshole Tomography, Singlehole Sonic Logging, or Sonic Echo/Impulse Response, etc.) or concrete cores to sample the concrete in question to verify shaft conditions. If core samples are needed, obtain cores with a minimum diameter of 2 inches, unless directed otherwise by the Engineer. Unless directed otherwise by the Engineer, locate core holes approximately 6 inches inside the reinforcement such that they do not damage the reinforcement. For each core hole drilled, record a log with descriptions of inclusions and voids in the cored holes and submit a copy of the log to the Engineer. Place the cores in crates properly marked showing the shaft depth at each interval of core recovery. Transport the cores and logs to the Geotechnical Branch in Frankfort for inspection and testing. Grout the core holes in accordance with Section 3.2 above.
- 5.6** If the additional testing or evaluation of cores indicate that concrete for any drilled shaft on which additional testing or coring was required is acceptable, the Department will pay for the additional testing and concrete coring and grouting on a cost plus basis. If the additional testing or evaluations of cores indicate that the concrete for any drilled shaft concrete is unacceptable, the additional testing and concrete coring and grouting will be at the expense of the Contractor.
- 5.7** If defects are found, the original structural designer will perform structural analyses, at the expense of the Contractor, based on the design criteria established for the structure to assess the effects of the defects on the structural performance of the drilled shaft. If the results of the analyses indicate that there is conclusive evidence that the defects will result in inadequate or unsafe performance under the design loads, as defined by the design criteria for the structure, the Engineer will reject the shaft.
- 5.8** If any shaft is rejected, provide a plan for remedial action to the Engineer for approval. Any modifications to the foundation shafts and/or other substructure elements caused by the remedial action will require calculations and working drawings by the original structural designer, at the expense of the Contractor. Begin remediation operations only after receiving approval from the Engineer for the proposed remediation. All remedial action will be at no cost to the Department and with no extension of contract time.

6.0 METHOD OF MEASUREMENT

The Department will pay for the authorized and accepted quantities of "CSL Testing" at the contract unit price per each shaft tested (production and technique drilled shafts). This will constitute full compensation for all costs associated with providing access for testing personnel and equipment, performing the CSL Testing in a single shaft, and reporting the results to the Engineer.

Installation of CSL Access Tubing is incidental to the applicable contract unit bid price for Drilled Shaft, Common, and Drilled Shaft, Solid Rock. This will constitute all costs and delays associated with installing the CSL Access Tubing in a single shaft, including but not limited to providing and installing access tubing, providing and installing all required bracing for access tubes, providing and placing grout in access tubes.

The Department will pay using a change order for the direct cost of additional testing and concrete coring, authorized by the Engineer, required to investigate shafts with inconclusive CSL records if evaluation of the additional testing or cores indicates that concrete for that drilled shaft is acceptable. This will constitute full compensation for all costs and delays associated with performing additional tests, obtaining and delivering concrete cores to the Geotechnical Branch, and grouting core holes.

7.0 PAYMENT

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

Code	Pay Item	Unit
21321NC	CSL Testing (4 tubes)	Each

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

UTILITIES AND RAIL CERTIFICATION NOTE

Fayette County
ONHPP1602003
FD52 034 7996301U
Mile point: 1.470 TO 3.220
IMPROVE NEWTOWN PIKE FROM KY-4 TO I-75. (16CCR)(18CCR)(2020CCR) (2022CCR)
ITEM NUMBER: 07-252.00

PROJECT NOTES ON UTILITIES

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.

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

- AT&T Kentucky - Communication
- Charter DBA Spectrum - CATV
- Columbia Gas of Kentucky - Natural Gas
- Kentucky-American Water Company - Drinking Water Distribution
- Kentucky Utilities - Electric Distribution
- Ledcor / Kentucky Wired - Communication
- Lumen / Level 3 / CenturyLink Communication, LLC - Communication
- Lexington Fayette Urban County Government - Sewer
- Metro Net - Communication
- Windstream dba Windstream Holdings II, LLC – Communication
- Windstream KDL dba Windstream Holdings II, LLC - Communication

The Contractor is fully responsible for protection of all utilities listed above

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

Not Applicable

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THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE OWNER OR THEIR SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

AT&T - KY – Communication

The company has submitted relocation plans and estimates. Their agreement has been routed for signatures and is anticipated being executed by September 18, 2023. AT&T Kentucky has aerial facilities attached to existing Kentucky Utilities poles within a limited area of relocation along the west side of Newtown Pike approximately from Station 107+00 to Station 118+13. AT&T Kentucky will transfer its existing fiber optic cable from existing Kentucky Utilities poles to proposed KU poles beginning at Newtown Court Station 51+53.5 and remaining along the existing KU pole line attaching to proposed KU poles along the west side of Newtown Pike at approximately Station 113+25.5, 114+85, 116+10, and 118+13 before turning perpendicular to west side of Newtown Pike and leaving the construction limits following the existing pole line behind the building on KYTC plan set Parcel 4 running west behind the buildings along Nandino Boulevard. AT&T's anticipated completion date is July 31, 2024.

Charter dba Spectrum – CATV, Communications

The company has yet to provide a proposed relocation plan for their facilities; consequently, we are unable to identify the current, or proposed, location of the company's facilities. It is anticipated that the company will have facilities along Newtown Pike. The company's aerial facilities will likely attach to the new KU poles throughout the project. It is also possible that the company will have facilities located at other locations throughout the project. Charter dba Spectrum's anticipated completion date is July 31, 2024.

Columbia Gas – Natural Gas Distribution

The company has yet to provide a proposed relocation plan for their facilities; consequently, we are unable to identify the current, or proposed, location of the company's facilities. It is anticipated that the company will have facilities along Newtown Pike. It is also possible that the company will have facilities located at other locations throughout the project. The company is estimated to begin relocation work on April 1, 2024 with an estimated completion date of November 1, 2024.

Kentucky-American Water Company – Drinking Water Distribution

The company has yet to provide a proposed relocation plan for their facilities; consequently, we are unable to identify the current, or proposed, location of the company's facilities. It is anticipated that the company will have facilities along Newtown Pike. The company's relocation work along Newtown will not be one continuous waterline relocation but will instead leave sections of the existing waterline intact. Kentucky American will relocate individual sections of waterline throughout the project. It is also

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ITEM NUMBER: 07-252.00

possible that the company will have facilities located at other locations throughout the project. Kentucky American Water’s anticipated completion date is April 30, 2024.

Kentucky Utilities - Electric Distribution

The company has submitted its relocation plans and KYTC is waiting for estimates in order to draft an agreement. The agreement between KU and KYTC is expected to be executed by September 30, 2023. The company will install new poles at various locations from Station 107+25 to Station 167+97 and the majority of these new poles will be installed along the west side of Newtown Pike near KU’s existing pole line. These pole relocations will include poles near Station 107+25, 113+25, 114+85, 116+10, 118+13, 118+90, 120+53, 131+45, 136+81, 137+87, with a new wire crossing at 137+10, poles near 140+50, 144+25, 148+18, 149+44, 150+17, and 164+97. The anticipated completion date is February 28, 2024.

Ledcor / Kentucky Wired – Communication

The company has yet to provide a proposed relocation plan for their facilities; consequently, we are unable to identify the current, or proposed, location of the company’s facilities. It is anticipated that the company will have facilities along Newtown Pike. The company has stated that the majority of its facilities are currently attached to the existing KU poles and the company will likely transfer its facilities to the new KU poles when they are installed. It is also possible that the company will have facilities located at other locations throughout the project. The anticipated completion date is July 31, 2024

Lumen / Level 3 / CenturyLink Communication, LLC – Communication

Lumen / Level 3 / CenturyLink Communication, LLC has a fiber optic duct to be installed at approximately Sta 130+00. The roadway contractor will be required to notify Lumen 21 days prior to installing the CBI and storm sewer pipe located at LT Sta 129+75 and shall coordinate with Lumen to ensure fiber optic line is installed at an appropriate depth to avoid the storm sewer and the existing stone wall along the western side of Newtown Pike. Additionally, Lumen is attached to the KU poles along the western right of way of Newtown Pike from Newtown Court to Aristides Boulevard and will attach to the new KU poles once KU has completed their relocation work. No relocation plans have been submitted from Lumen at this time. Contact Richard Compton with Lumen for coordination – 859-413-8254 or 859-550-2208 – Richard.compton@lumen.com

Metro Net – Communication

The company has yet to provide a proposed relocation plan for their facilities; consequently, we are unable to identify the current, or proposed, location of the company’s facilities. It is anticipated that the company will have facilities along Newtown Pike. It is also possible that the company will have facilities located at other locations throughout the project. The anticipated completion date is July 31, 2024

UTILITIES AND RAIL CERTIFICATION NOTE

<p>Fayette County ONHPP1602003 FD52 034 7996301U Mile point: 1.470 TO 3.220 IMPROVE NEWTOWN PIKE FROM KY-4 TO I-75. (16CCR)(18CCR)(2020CCR) (2022CCR) ITEM NUMBER: 07-252.00</p>
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Windstream dba Windstream Holdings II, LLC – Communication

The company has yet to provide a proposed relocation plan for their facilities; consequently, we are unable to identify the current, or proposed, location of the company’s facilities. It is anticipated that the company will have facilities along Newtown Pike. Preliminary Windstream facilities maps indicate both aerial and buried fiber conflicts on both sides of Newtown Pike approximately from Station 107+00 through Station 154+00. The majority of Windstream’s aerial fiber is currently attached to existing KU poles. It is also possible that the company will have facilities located at other locations throughout the project. The anticipated completion date is July 31, 2024.

Windstream KDL dba Windstream Holdings II, LLC – Communication

The company has yet to provide a proposed relocation plan for their facilities; consequently, we are unable to identify the current, or proposed, location of the company’s facilities. It is anticipated that the company will have facilities along Newtown Pike. It is also possible that the company will have facilities located at other locations throughout the project. The anticipated completion date is July 31, 2024

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

Lexington Fayette Urban County Government – Sewer Collection

The city is relocating a single segment of sanitary sewer along the west side of Newtown Pike beginning approximately at Station 118+40 and crossing Cane Run Creek at Station 118+95 to its juncture with an existing 30” sanitary sewer line approximately at 119+75.

RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

No Rail Involvement Rail Involved Rail Adjacent

UTILITIES AND RAIL CERTIFICATION NOTE

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AREA FACILITY OWNER CONTACT LIST

Facility Owner	Address	Contact Name	Phone	Email
AT&T - KY - Communication	894 E. Main St. Ext. Georgetown KY 40324	Frank Ambrose	859-753-8377	fa2207@att.com
Charter DBA Spectrum - CATV	1575 Winchester Road Lexington KY 40505	John Oram	859-519-3434	john.oram@charter.com
Columbia Gas of Kentucky - Natural Gas	PO Box 14241 Lexington KY 40512	Andrew Weber	859-288-0253	aweber@nisource.com
Kentucky Utilities - Electric Distribution	820 W. Broadway Louisville KY 40202	Caroline Justice	502-627-3708	Caroline.Justice@lge-ku.com
Kentucky-American Water Company - Water	2300 Richmond Road Lexington KY 40502	John Magner	859-268-6349	John.magner@amwater.com
Ledcor - Communication	2008 Mercer Road Lexington Ky 40511	Jonathon Young	442-236-2533	Jonathon.Young@ledcor.com
Lumen/Level 3 / CenturyLink Communication, LLC - Communication	565 W. Main St. Lexington KY 40507	Richard Compton	859-550-2208 859-413-8254	Richard.Compton@Lumen.com
Lexington Fayette Urban County Government – Sanitary Sewer	301 Lisle Industrial Avenue Lexington KY 40511	Chris Dent	859-258-3472	cdent@lexingtonky.gov
Metro Net - Communication	904 N Broadway Lexington KY 40507	Doug Haney	606-336-1853	doug.haney@metronet.com
Windstream Holdings II, LLC - Communication	130 West New Circle Road Lexington KY 40505	Mark Ware Steve Johnson	606-329-6195 859-357-6209	Mark.Ware@windstream.com Steve.Johnson@windstream.com

KENTUCKY TRANSPORTATION CABINET COMMUNICATING ALL PROMISES (CAP)

Item No. 7 - 113.02 County: Fayette Route: 4 Project Manager: JOSHUA SAMPLES

10/9/23

CAP #	Date of Promise	Promise made to:	Location of Promise:	CAP Description
1	9/7/23	Kyle Ray	Parcel 26	1. That the Contractor upon being awarded the Project shall email Mr. Woodford Webb at wwebb@thewebbcompanies.com and provide the name of the Contractor as well as the name and telephone number for the best contact for the Contractor on the Project; 2. That at least fourteen (14) calendar days before starting work on the access to Parcel Number 26, the Contractor shall email Mr. Woodford Webb at wwebb@thewebbcompanies.com providing the expected start date; and 3. That the Contractor shall maintain reasonable means of vehicular access to and from Parcel Number 26 at all times throughout the course of the Project.

**KENTUCKY TRANSPORTATION CABINET
 COMMUNICATING ALL PROMISES (CAP)**

Item No. 7 - 113.02 County: Fayette Route: 4 Project Manager: JOSHUA SAMPLES

10/9/23

CAP #	Date of Promise	Promise made to:	Location of Promise:	CAP Description
2	9/7/23	Kyle Ray	Parcel 22, 23, 24, and 34	<p>a. That the Contractor upon being awarded the Project shall email Jon Strom at jstrom@andersoncommunities.com and provide the name of the Contractor as well as the name and telephone number for the best contact for the Contractor on the Project;</p> <p>b. That at least fourteen (14) calendar days before starting work on the Project, the Contractor shall email Jon Strom at jstrom@andersoncommunities.com providing the expected start date;</p> <p>c. That at least fourteen (14) calendar days before starting work that would close the intersection of Leestown Road and Louis Place to vehicular traffic turning into Louis Place from Leestown Road or turning onto Leestown Road from Louis Place, the Contractor shall email Jon Strom at jstrom@andersoncommunities.com providing the expected start date;</p> <p>d. That at least fourteen (14) calendar days before starting work at the intersection of Leestown Road and Towne Center Drive, where said work would restrict the number of lanes currently available for vehicles turning into Towne Center Drive from Leestown Road or onto Leestown Road from Towne Center Drive, the Contractor shall email Jon Strom at jstrom@andersoncommunities.com providing the expected closure date;</p> <p>e. That the intersection of Leestown Road and Towne Center Drive shall remain open to vehicular traffic throughout the length of the Project so that there is at a minimum one lane open for vehicles turning into Towne Center Drive from Leestown Road and one lane open for vehicles turning onto Leestown Road from Towne Center Drive;</p> <p>f. That the intersection of Leestown Road and Boiling Springs Drive/ Kroger Entrance shall remain open to vehicular traffic throughout the length of the Project so that there is at a minimum one lane open for vehicles turning into Boiling Springs Drive/ Kroger Entrance from Leestown Road and one lane open for vehicles turning onto Leestown Road from Boiling Springs Drive/ Kroger Entrance;</p> <p>g. That during any time period the Contractor performs work at one (1) of the following three (3) intersections: Leestown Road and Towne Center Drive; Leestown Road and Louis Place; and Leestown Road and Boiling Springs Drive/ Kroger Entrance that limits or restricts vehicular traffic turning into Towne Center Drive, Louis Place or Boiling Springs Drive/ Kroger Entrance from Leestown or turning onto Leestown Road from Towne Center Drive, Louis Place or Boiling Springs Drive/ Kroger Entrance, the Contractor shall only perform work at one (1) of the three (3) aforementioned intersections at any said time so that the other two (2) aforementioned intersections shall remain fully open to vehicular traffic;</p>
3	10/4/23	Kelly Baker	Entire project	The contractor will leave any trees outside the construction limits and activities undisturbed including in the interchange areas.

SECTION 40 05 00
SANITARY SEWER PIPING AND APPURTENANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Gravity sewer piping.
 - 2. Force main piping.
 - 3. Steel encasement pipe.
 - 4. Sewage combination air valve.
 - 5. Chemical resistant coating for wastewater structures.
 - 6. Controlled density (Flowable) fill.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. ASTM International (ASTM).
 - 2. American Water Works Association (AWWA).
 - 3. American Water Works Association/American National Standards Institute (AWWA/ANSI).
 - 4. International Plumbing Code (IPC).
 - 5. Underwriters Laboratories, Inc. (UL).

1.3 DEFINITIONS

- A. HPIC: High performance industrial coating.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect pipe coating during handling using methods recommended by manufacturer.
 - 1. Use of bare cables, chains, hooks, metal bars or narrow skids in contact with coated pipe is not permitted.
- B. Prevent damage to pipe during transit.
 - 1. Repair abrasions, scars, and blemishes.
 - 2. If repair of satisfactory quality cannot be achieved, replace damaged material immediately.

PART 2 - PRODUCTS

2.1 GRAVITY SEWER PIPING

- A. Ductile iron pipe for gravity sewers shall conform to Section 02732 and shall be furnished with ceramic epoxy lining, Protecto 401 or equivalent.
- B. PVC pipe for gravity sewers shall be SDR 35 and shall conform to Section 02732.

2.2 FORCE MAIN PIPING

- A. PVC Force main piping shall be C900 pressure-rated PVC pipe, DR 21 (200 psi), nominal laying length 20 feet, green color. Pipe shall conform to AWWA C900-16, ASTM D1784 Cell Class 12454.
- B. Gasket: ASTM F477
- C. Joint: ASTM D3139
- D. Provide with bell restraint harness at each joint, complying with ANSI/AWWA C900-16, EBAA Iron Series 2800 or approved equivalent.

2.3 FORCE MAIN FITTINGS

- A. Ductile iron, mechanical joint, conform to Section 02732. Provide with mechanical joint restraints, EBAA Iron Series 2000PV or equivalent.

2.4 STEEL ENCASEMENT PIPE

- A. Structural grade steel: Blass B with minimum yield strength of 35,000 PSI.
- B. Wall thickness: Minimum 0.25 IN.
- C. Diameter: Minimum of 4 IN larger than outside diameter of carrier pipe's jointing system.
- D. Pipeline Spacers: Polyethylene, Raci Spacers or equal.
- E. End Seals: EPDM or neoprene rubber membrane, 1/8-inch thick, with stainless steel banding straps.

2.5 SEWAGE COMBINATION AIR VALVE

- A. Sewage combination air valve shall be 2-inch A.R.I. D-025 ST ST or equivalent combination air valve for wastewater, short version, with stainless steel SAE 316 body.

2.6 CHEMICAL RESISTANT COATINGS

- A. Manufacturers: Carboline Protective Coatings, PPG Industries, Sherwin Williams, Tnemec, or approved equivalent. Products listed are manufactured by Tnemec.
- B. Generic Description and Products:
 - 1. Polyamidoamine Epoxy: Series L69 Hi-Build Epoxoline II
 - 2. Polyfunctional Hybrid Urethane (Semi-Gloss): Series 750 UVX

2.7 CONTROLLED DENSITY (FLOWABLE) FILL

- A. Controlled density (flowable) fill for safeloading shall be mixture of cement, fly ash, fine sand, water, and air having a consistency which will flow under a very low head.
- B. Flowable fill mix design shall conform to Kentucky Department of Highways specifications.
- C. Approximate compressive strength shall be 85 to 175 PSI.
- D. Fine sand shall be an evenly graded material having not less than 95 percent passing the No. 4 sieve and not more than 5 percent passing the No. 200 sieve.

2.8 COMPONENTS AND ACCESSORIES

- A. Reducers:
 - 1. Furnish appropriate size reducers and reducing fittings to mate pipe to equipment connections.
 - 2. Connection size requirements may change from those shown on Drawings depending on equipment furnished.
- B. Protective Coating and Lining:
 - 1. Include pipe, fittings, and appurtenances where coatings, linings, coating, tests and other items are specified.

PART 3 - EXECUTION

3.1 EXTERIOR BURIED PIPING INSTALLATION

- A. Laying Pipe In Trench:
 - 1. Excavate and backfill trench in accordance with Specification Section 02225.
 - 2. Clean each pipe length thoroughly and inspect for compliance to specifications.
 - 3. Grade trench bottom and excavate for pipe bell and lay pipe on trench bottom.

4. Install gasket or joint material according to manufacturer's directions after joints have been thoroughly cleaned and examined.
 5. Lay pipe in only suitable weather with good trench conditions.
 - a. Never lay pipe in water except where approved by Engineer.
 6. Seal open end of line with watertight plug if pipe laying stopped.
 7. Remove water in trench before removal of plug.
- B. Lining Up Push-On Joint Piping:
1. Lay piping on route lines shown on Drawings.
 2. Deflect from straight alignments or grades by vertical or horizontal curves or offsets.
 3. Observe maximum deflection values stated in manufacturer's written literature.
 4. Provide special bends when specified or where required alignment exceeds allowable deflections stipulated.
 5. Install shorter lengths of pipe in such length and number that angular deflection of any joint, as represented by specified maximum deflection, is not exceeded.
- C. Anchorage and Blocking:
1. Provide reaction blocking, anchors, joint harnesses, or other acceptable means for preventing movement of piping caused by forces in or on buried piping tees, wye branches, plugs, or bends.
 2. Place concrete blocking so that it extends from fitting into solid undisturbed earth wall.
 - a. Concrete blocks shall not cover pipe joints.
 3. Provide bearing area of concrete in accordance with drawing detail.
- D. Install underground hazard warning tape per Specification Section 02732.

3.2 CONNECTIONS WITH EXISTING PIPING

- A. Where connection between new work and existing work is made, use suitable and proper fittings to suit conditions encountered.
- B. Perform connections with existing piping at time and under conditions which will least interfere with service to customers affected by such operation.
- C. Undertake connections in fashion which will disturb system as little as possible.
- D. Provide suitable equipment and facilities to dewater, drain, and dispose of liquid removed without damage to adjacent property.
- E. Where connections to existing systems necessitate employment of past installation methods not currently part of trade practice, utilize necessary special piping components.
- F. Once tie-in to each existing system is initiated, continue work continuously until tie-in is made and tested.

3.3 STEEL ENCASEMENT PIPE

- A. Install encasement pipe without bends. All joints in encasement pipe shall be welded. Welds shall be solid butt welds with a smooth non-obstructing joint inside and shall conform to American Welding Society specifications.
- B. Pipeline spacers shall be selected and installed per the manufacturer's specifications. Spacers shall be placed immediately behind each pipe bell and installed with a maximum distance of 10 feet between spacers.
- C. Fill void between carrier pipe and casing wall with blow sand, flowable fill or grout.

3.4 CHEMICAL RESISTANT COATINGS

- A. For interior of sewage combination air valve structure, apply coatings as follows:
 1. Prepare surface in accordance with manufacturer's recommendations.
 2. Filler/Surfacer: 1/16 inches, Series 218
 3. Prime Coat: 3.0 to 4.0 mils, Series L69

- 4. Intermediate Coat: 3.0 to 4.0 mils, Series L69
- 5. Finish Coat: 2.5 to 3.5 mils, Series 750

B. Apply coatings in accordance with manufacturer’s recommendations.

3.5 FIELD QUALITY CONTROL

A. Pipe Testing - General:

- 1. Test piping systems as follows:
 - a. Test buried piping prior to backfilling.
- 2. Isolate equipment which may be damaged by the specified pressure test conditions.
- 3. Perform pressure test using calibrated pressure gages and calibrated volumetric measuring equipment to determine leakage rates.
 - a. Select each gage so that the specified test pressure falls within the upper half of the gage's range.
 - b. Notify the Engineer 24 HRS prior to each test.
- 4. Completely assemble and test new piping systems prior to connection to existing pipe systems.
- 5. Acknowledge satisfactory performance of tests and inspections in writing to Engineer prior to final acceptance.
- 6. Bear the cost of all testing and inspecting, locating and remedying of leaks and any necessary retesting and re-examination.

B. Pressure Testing:

- 1. Testing medium: Utilize the following test media.
 - a. Liquid systems:

PIPE LINE SIZE (DIA)	GRAVITY OR PUMPED	SPECIFIED TEST PRESSURE	TESTING MEDIUM
Up to and including 48 IN	Gravity	25 PSIG or less	Air or water
All sizes	Pumped	200 PSIG or less	Water

- 2. Allowable leakage rates:
 - a. All pressure piping systems shall have zero leakage at the specified test pressure throughout the duration of the test.
 - b. Hydrostatic exfiltration and infiltration for sanitary sewers (groundwater level is above the top of pipe):
 - 1) Leakage rate: 200 GAL per inch diameter per mile of pipe per day at average head on test section of 3 FT.
 - 2) Average head is defined from groundwater elevation to average pipe crown.
 - 3) Acceptable test head leakage rate for heads greater than 3 FT: Acceptable leakage rate (gallons per inch diameter per mile per day) equals 115 by (actual test head to the 1/2 power).
 - c. For low pressure (less than 25 PSIG) air testing, the acceptable time for loss of 1 PSIG of air pressure shall be:

PIPE SIZE (IN DIA)	TIME, MINUTES/100 FT
4	0.3
6	0.7
8	1.2
10	1.5
12	1.8

PIPE SIZE (IN DIA)	TIME, MINUTES/100 FT
15	2.1
18	2.4
21	3.0
24	3.6
27	4.2
30	4.8
33	5.4
36	6.0
42	7.3
48	7.6

3. Hydrostatic pressure testing methodology:
 - a. General:
 - 1) All joints, including welds, are to be left exposed for examination during the test.
 - 2) Provide temporary restraints for expansion joints for additional pressure load under test.
 - 3) Isolate equipment in piping system with rated pressure lower than pipe test pressure.
4. Air testing methodology:
 - a. General:
 - 1) Assure air is ambient temperature.
 - b. Low pressure air testing:
 - 1) Place plugs in line and inflate to 25 PSIG.
 - 2) Check pneumatic plugs for proper sealing.
 - 3) Introduce low pressure air into sealed line segment until air pressure reaches 4 PSIG greater than ground water that may be over the pipe.
 - a) Use test gage conforming to ASME B40.100 with 0 to 15 PSI scale and accuracy of 1 PCT of full range.
 - 4) Allow 2 minutes for air pressure to stabilize.
 - 5) After stabilization period (3.5 PSIG minimum pressure in pipe) discontinue air supply to line segment.
 - 6) Record pressure at beginning and end of test.

3.6 CLEANING

- A. Cleaning:
 1. Clean interior of piping systems thoroughly before installing.
 2. Maintain pipe in clean condition during installation.
 3. Before jointing piping, thoroughly clean and wipe joint contact surfaces and then properly dress and make joint.
 4. At completion of work and prior to Final Acceptance, thoroughly clean work installed under these Specifications.

3.7 LOCATION OF BURIED OBSTACLES

- A. Furnish exact location and description of buried utilities encountered and thrust block placement.
- B. Reference items to definitive reference point locations such as found property corners, entrances to buildings, existing structure lines, fire hydrants and related fixed structures.
- C. Include such information as location, elevation, coverage, supports and additional pertinent information.

D. Incorporate information on "As-Recorded" Drawings.

END OF SECTION

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Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	64,368.00	TON		\$	
0020	00018		DRAINAGE BLANKET-TYPE II-ASPH	24,341.00	TON		\$	
0030	00022		JPC PAVEMENT DRAINAGE BLANKET	97.00	TON		\$	
0040	00100		ASPHALT SEAL AGGREGATE	156.00	TON		\$	
0050	00103		ASPHALT SEAL COAT	20.00	TON		\$	
0060	00190		LEVELING & WEDGING PG64-22	8,537.00	TON		\$	
0070	00212		CL2 ASPH BASE 1.00D PG64-22	2,444.00	TON		\$	
0080	00214		CL3 ASPH BASE 1.00D PG64-22	36,977.00	TON		\$	
0090	00217		CL4 ASPH BASE 1.00D PG64-22	20,219.00	TON		\$	
0100	00219		CL4 ASPH BASE 1.00D PG76-22	7,325.00	TON		\$	
0110	00307		CL2 ASPH SURF 0.38B PG64-22	27.00	TON		\$	
0120	00339		CL3 ASPH SURF 0.38D PG64-22	2,301.00	TON		\$	
0130	00342		CL4 ASPH SURF 0.38A PG76-22	4,331.00	TON		\$	
0140	00356		ASPHALT MATERIAL FOR TACK	255.00	TON		\$	
0150	02069		JPC PAVEMENT-10 IN	251.00	SQYD		\$	
0160	02101		CEM CONC ENT PAVEMENT-8 IN	19.00	SQYD		\$	
0170	02604		FABRIC-GEOTEXTILE CLASS 1A	95,763.00	SQYD		\$	
0180	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0190	02677		ASPHALT PAVE MILLING & TEXTURING	40,198.00	TON		\$	
0200	08100		CONCRETE-CLASS A	177.00	CUYD		\$	
0210	22906ES403		CL3 ASPH SURF 0.38A PG64-22	4,972.00	TON		\$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0220	00021		DRAINAGE BLANKET-EMBANKMENT	860.00	CUYD		\$	
0230	00078		CRUSHED AGGREGATE SIZE NO 2	34.00	TON		\$	
0240	01000		PERFORATED PIPE-4 IN	17,732.00	LF		\$	
0250	01001		PERFORATED PIPE-6 IN	1,874.00	LF		\$	
0260	01010		NON-PERFORATED PIPE-4 IN	1,209.00	LF		\$	
0270	01011		NON-PERFORATED PIPE-6 IN	104.00	LF		\$	
0280	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM	1.00	LS		\$	
0290	01020		PERF PIPE HEADWALL TY 1-4 IN	5.00	EACH		\$	
0300	01028		PERF PIPE HEADWALL TY 3-4 IN	23.00	EACH		\$	
0310	01032		PERF PIPE HEADWALL TY 4-4 IN	6.00	EACH		\$	
0320	01310		REMOVE PIPE	2,874.00	LF		\$	
0330	01634		CAP CURB BOX INLET	7.00	EACH		\$	
0340	01655		REMOVE JUNCTION BOX	1.00	EACH		\$	
0350	01718		REMOVE INLET	20.00	EACH		\$	
0360	01740		CORED HOLE DRAINAGE BOX CON-4 IN	106.00	EACH		\$	
0370	01741		CORED HOLE DRAINAGE BOX CON-6 IN	13.00	EACH		\$	
0380	01787		REMOVE MANHOLE	1.00	EACH		\$	
0390	01810		STANDARD CURB AND GUTTER	12,980.00	LF		\$	
0400	01825		ISLAND CURB AND GUTTER	1,285.00	LF		\$	
0410	01830		STANDARD INTEGRAL CURB	684.00	LF		\$	
0420	01880		BARRIER HEADER CURB	74.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0430	01923		STANDARD BARRIER MEDIAN TYPE 5	629.00	SQYD		\$	
0440	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	43.00	EACH		\$	
0450	01984		DELINEATOR FOR BARRIER - WHITE	401.00	EACH		\$	
0460	01985		DELINEATOR FOR BARRIER - YELLOW	873.00	EACH		\$	
0470	02001		CURB TO BARRIER WALL TRANS	4.00	EACH		\$	
0480	02003		RELOCATE TEMP CONC BARRIER	31,080.00	LF		\$	
0490	02006		REMOVE CONCRETE MEDIAN	188.00	LF		\$	
0500	02014		BARRICADE-TYPE III	27.00	EACH		\$	
0510	02159		TEMP DITCH	8,058.00	LF		\$	
0520	02160		CLEAN TEMP DITCH	4,029.00	LF		\$	
0530	02165		REMOVE PAVED DITCH	80.00	SQYD		\$	
0540	02200		ROADWAY EXCAVATION	110,402.00	CUYD		\$	
0550	02203		STRUCTURE EXCAV-UNCLASSIFIED	381.00	CUYD		\$	
0560	02242		WATER	1,526.00	MGAL		\$	
0570	02262		FENCE-WOVEN WIRE TYPE 1	886.00	LF		\$	
0580	02265		REMOVE FENCE	3,514.00	LF		\$	
0590	02274		FENCE-6 FT CHAIN LINK	354.00	LF		\$	
0600	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A	4.00	EACH		\$	
0610	02367		GUARDRAIL END TREATMENT TYPE 1	1.00	EACH		\$	
0620	02369		GUARDRAIL END TREATMENT TYPE 2A	3.00	EACH		\$	
0630	02381		REMOVE GUARDRAIL	2,398.00	LF		\$	
0640	02387		GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	2.00	EACH		\$	
0650	02391		GUARDRAIL END TREATMENT TYPE 4A	4.00	EACH		\$	
0660	02429		RIGHT-OF-WAY MONUMENT TYPE 1	30.00	EACH		\$	
0670	02432		WITNESS POST	30.00	EACH		\$	
0680	02483		CHANNEL LINING CLASS II	3,275.00	TON		\$	
0690	02484		CHANNEL LINING CLASS III	378.00	TON		\$	
0700	02545		CLEARING AND GRUBBING 59 ACRES	1.00	LS		\$	
0710	02555		CONCRETE-CLASS B	440.00	CUYD		\$	
0720	02562		TEMPORARY SIGNS	1,715.00	SQFT		\$	
0730	02585		EDGE KEY	107.00	LF		\$	
0740	02603		FABRIC-GEOTEXTILE CLASS 2	5,345.00	SQYD		\$	
0750	02607		FABRIC-GEOTEXTILE CLASS 2 FOR PIPE	29,736.00	SQYD	\$2.00	\$	\$59,472.00
0760	02611		HANDRAIL-TYPE A-1	850.00	LF		\$	
0770	02625		REMOVE HEADWALL	32.00	EACH		\$	
0780	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0790	02671		PORTABLE CHANGEABLE MESSAGE SIGN	5.00	EACH		\$	
0800	02690		SAFELoading	98.00	CUYD		\$	
0810	02696		SHOULDER RUMBLE STRIPS	27,066.00	LF		\$	
0820	02701		TEMP SILT FENCE	8,058.00	LF		\$	
0830	02703		SILT TRAP TYPE A	73.00	EACH		\$	
0840	02704		SILT TRAP TYPE B	73.00	EACH		\$	
0850	02705		SILT TRAP TYPE C	73.00	EACH		\$	
0860	02706		CLEAN SILT TRAP TYPE A	73.00	EACH		\$	
0870	02707		CLEAN SILT TRAP TYPE B	73.00	EACH		\$	
0880	02708		CLEAN SILT TRAP TYPE C	73.00	EACH		\$	
0890	02719		SIDEWALK-4 1/2 INCH CONCRETE	3,938.00	SQYD		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0900	02726		STAKING	1.00	LS		\$	
0910	02731		REMOVE STRUCTURE - LEESTOWN ROAD DRAINAGE STRUCTURE STA 88+02	1.00	LS		\$	
0920	02731		REMOVE STRUCTURE - TWIN BRIDGES OVER LEESTOWN ROAD	1.00	LS		\$	
0930	02731		REMOVE STRUCTURE - TWIN BRIDGES OVER NORFOLK SOUTHERN	1.00	LS		\$	
0940	02731		REMOVE STRUCTURE - LEESTOWN ROAD DRAINAGE STRUCTURE STA 110+11	1.00	LS		\$	
0950	02898		RELOCATE CRASH CUSHION	8.00	EACH		\$	
0960	03171		CONCRETE BARRIER WALL TYPE 9T	13,740.00	LF		\$	
0970	03262		CLEAN PIPE STRUCTURE	5.00	EACH		\$	
0980	04810		ELECTRICAL JUNCTION BOX	26.00	EACH		\$	
0990	05950		EROSION CONTROL BLANKET	7,094.00	SQYD		\$	
1000	05952		TEMP MULCH	85,765.00	SQYD		\$	
1010	05953		TEMP SEEDING AND PROTECTION	64,330.00	SQYD		\$	
1020	05963		INITIAL FERTILIZER	7.00	TON		\$	
1030	05964		MAINTENANCE FERTILIZER	4.00	TON		\$	
1040	05985		SEEDING AND PROTECTION	128,648.00	SQYD		\$	
1050	05989		SPECIAL SEEDING CROWN VETCH	28,830.00	SQYD		\$	
1060	05990		SODDING	2,594.00	SQYD		\$	
1070	05992		AGRICULTURAL LIMESTONE	80.00	TON		\$	
1080	06401		FLEXIBLE DELINEATOR POST-M/W	216.00	EACH		\$	
1090	06404		FLEXIBLE DELINEATOR POST-M/Y	69.00	EACH		\$	
1100	06511		PAVE STRIPING-TEMP PAINT-6 IN	260,100.00	LF		\$	
1110	06610		INLAID PAVEMENT MARKER-MW	146.00	EACH		\$	
1120	06612		INLAID PAVEMENT MARKER-BY	237.00	EACH		\$	
1130	06613		INLAID PAVEMENT MARKER-B W/R	588.00	EACH		\$	
1140	08901		CRASH CUSHION TY VI CLASS BT TL2	7.00	EACH		\$	
1150	10020NS		FUEL ADJUSTMENT	221,494.00	DOLL	\$1.00	\$	\$221,494.00
1160	10030NS		ASPHALT ADJUSTMENT	341,652.00	DOLL	\$1.00	\$	\$341,652.00
1170	20099ES842		PAVE MARK TEMP PAINT STOP BAR	747.00	LF		\$	
1180	20100ES842		PAVE MARK TEMP PAINT LINE ARROW	315.00	EACH		\$	
1190	20394ES835		PVC CONDUIT-3 IN- IN MEDIAN BARRIER WALL	5,666.00	LF		\$	
1200	20411ED		LAW ENFORCEMENT OFFICER	200.00	HOURL		\$	
1210	20430ED		SAW CUT	12,037.00	LF		\$	
1220	20432ES112		REMOVE CRASH CUSHION	2.00	EACH		\$	
1230	21119ED		CONCRETE FORM LINER	343.00	SQYD		\$	
1240	21288ND		CONC MEDIAN BARRIER TYPE 12C2-50 IN	762.00	LF		\$	
1250	21802EN		G/R STEEL W BEAM-S FACE (7 FT POST)	3,423.00	LF		\$	
1260	22664EN		WATER BLASTING EXISTING STRIPE	232,050.00	LF		\$	
1270	23158ES505		DETECTABLE WARNINGS	695.00	SQFT		\$	
1280	23274EN11F		TURF REINFORCEMENT MAT 1	17.00	SQYD		\$	
1290	23769EC		ROCK FENCE -REMOVE AND REBUILD	374.00	LF		\$	
1300	23862EC		SILT TRAP TYPE B-PERM	5.00	EACH		\$	
1310	24651ED		CONCRETE ISLAND	11.00	SQYD		\$	
1320	24654ED		SINGLE SLOPE MEDIAN BARRIER	5,490.00	LF		\$	

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1325	24665EX		RAILROAD COORDINATION (ADDED 10-12-2023)	1.00	LS		\$	
1330	24814EC		PIPELINE INSPECTION	11,828.00	LF		\$	
1340	24845EC		UTILITY COORDINATION	1.00	LS		\$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1350	00440		ENTRANCE PIPE-15 IN	30.00	LF		\$	
1360	00499		CULVERT PIPE-48 IN EQUIV	121.00	LF		\$	
1370	00521		STORM SEWER PIPE-15 IN	3,197.00	LF		\$	
1380	00522		STORM SEWER PIPE-18 IN	2,052.00	LF		\$	
1390	00524		STORM SEWER PIPE-24 IN	2,546.00	LF		\$	
1400	00526		STORM SEWER PIPE-30 IN	3,434.00	LF		\$	
1410	00530		STORM SEWER PIPE-48 IN	133.00	LF		\$	
1420	00981		SLOTTED DRAIN PIPE-15 IN	533.00	LF		\$	
1430	01202		PIPE CULVERT HEADWALL-15 IN	2.00	EACH		\$	
1440	01204		PIPE CULVERT HEADWALL-18 IN	4.00	EACH		\$	
1450	01208		PIPE CULVERT HEADWALL-24 IN	1.00	EACH		\$	
1460	01210		PIPE CULVERT HEADWALL-30 IN	1.00	EACH		\$	
1470	01217		PIPE CULVERT HEADWALL-48 IN EQUIV	1.00	EACH		\$	
1480	01374		METAL END SECTION TY 1-30 IN	1.00	EACH		\$	
1490	01450		S & F BOX INLET-OUTLET-18 IN	1.00	EACH		\$	
1500	01452		S & F BOX INLET-OUTLET-30 IN	1.00	EACH		\$	
1510	01456		CURB BOX INLET TYPE A	60.00	EACH		\$	
1520	01480		CURB BOX INLET TYPE B	4.00	EACH		\$	
1530	01487		CURB BOX INLET TYPE F	1.00	EACH		\$	
1540	01490		DROP BOX INLET TYPE 1	1.00	EACH		\$	
1550	01496		DROP BOX INLET TYPE 3	3.00	EACH		\$	
1560	01544		DROP BOX INLET TYPE 11	13.00	EACH		\$	
1570	01568		DROP BOX INLET TYPE 13S	1.00	EACH		\$	
1580	01580		DROP BOX INLET TYPE 15	2.00	EACH		\$	
1590	01581		DROP BOX INLET TYPE 16G	2.00	EACH		\$	
1600	01616		CONC MED BARR BOX INLET TY 14B1	7.00	EACH		\$	
1610	01641		JUNCTION BOX-15 IN	1.00	EACH		\$	
1620	01642		JUNCTION BOX-18 IN	1.00	EACH		\$	
1630	01756		MANHOLE TYPE A	2.00	EACH		\$	
1640	01767		MANHOLE TYPE C	1.00	EACH		\$	
1650	01768		MANHOLE TYPE C MOD	1.00	EACH		\$	
1660	01792		ADJUST MANHOLE	1.00	EACH		\$	
1670	21800EN		BORE AND JACK PIPE-30 IN	60.00	LF		\$	
1680	23126EN		BORE AND JACK PIPE-18 IN	249.00	LF		\$	
1690	23332EC		BORE AND JACK PIPE-42 IN	93.00	LF		\$	

Section: 0004 - BRIDGE - #27060 - NEW CIRCLE RD OVER LEESTOWN RD

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1700	01643		JUNCTION BOX-24 IN	3.00	EACH		\$	
1710	02231		STRUCTURE GRANULAR BACKFILL	777.00	CUYD		\$	
1720	03299		ARMORED EDGE FOR CONCRETE	249.30	LF		\$	
1730	04741		POLE BASE IN MEDIAN WALL	1.00	EACH		\$	
1740	04797		CONDUIT-3 IN	591.00	LF		\$	
1750	08003		FOUNDATION PREPARATION	1.00	LS		\$	
1760	08020		CRUSHED AGGREGATE SLOPE PROT	618.00	TON		\$	
1770	08033		TEST PILES	60.00	LF		\$	
1780	08039		PRE-DRILLING FOR PILES	546.70	LF		\$	
1790	08046		PILES-STEEL HP12X53	583.00	LF		\$	
1800	08094		PILE POINTS-12 IN	46.00	EACH		\$	
1810	08100		CONCRETE-CLASS A	243.80	CUYD		\$	
1820	08104		CONCRETE-CLASS AA	928.80	CUYD		\$	
1830	08130		MECHANICAL REINF COUPLER #5	54.00	EACH		\$	
1840	08133		MECHANICAL REINF COUPLER #8	34.00	EACH		\$	
1850	08134		MECHANICAL REINF COUPLER #9	32.00	EACH		\$	
1860	08137		MECHANICAL REINF COUPLER #14	86.00	EACH		\$	
1870	08140		MECHANICAL REINF COUPLER #5 EPOXY COATED	28.00	EACH		\$	
1880	08141		MECHANICAL REINF COUPLER #6 EPOXY COATED	790.00	EACH		\$	
1890	08150		STEEL REINFORCEMENT	47,049.00	LB		\$	
1900	08151		STEEL REINFORCEMENT-EPOXY COATED	277,267.00	LB		\$	
1910	20392NS835		ELECTRICAL JUNCTION BOX TYPE C	4.00	EACH		\$	
1920	20637ED		DRILLED SHAFT-ROCK 48 IN	70.00	LF		\$	
1930	20743ED		DRILLED SHAFT 54 IN-SOLID ROCK	4.00	LF		\$	
1940	20745ED		ROCK SOUNDINGS	39.20	LF		\$	
1950	20746ED		ROCK CORINGS	157.50	LF		\$	
1960	21321NC		CSL TESTING (4 TUBES)	7.00	EACH		\$	
1970	22417EN		DRILLED SHAFT-54 IN-COMMON	35.70	LF		\$	
1980	23378EC		CONCRETE SEALING	38,073.00	SQFT		\$	
1990	23780EC		UNDERPASS LIGHTING	1.00	LS		\$	
2000	23963EC		PPC I-BEAM TYPE HN 36-49	2,135.80	LF		\$	
2010	24654ED		SINGLE SLOPE MEDIAN BARRIER	197.00	LF		\$	
2020	25028ED		RAIL SYSTEM SINGLE SLOPE - 40 IN	394.00	LF		\$	

Section: 0005 - BRIDGE - #27061 - NEW CIRCLE RD OVER NORFOLK SOUTHERN RAILR

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2030	01643		JUNCTION BOX-24 IN	4.00	EACH		\$	
2040	02231		STRUCTURE GRANULAR BACKFILL	540.00	CUYD		\$	
2050	02275		FENCE-8 FT CHAIN LINK	218.00	LF		\$	
2060	03299		ARMORED EDGE FOR CONCRETE	259.90	LF		\$	
2070	04741		POLE BASE IN MEDIAN WALL	2.00	EACH		\$	
2080	04797		CONDUIT-3 IN	660.00	LF		\$	
2090	08003		FOUNDATION PREPARATION	1.00	LS		\$	
2100	08014		REINF CONC SLOPE WALL-4 IN	2,130.00	SQYD		\$	
2110	08020		CRUSHED AGGREGATE SLOPE PROT	106.00	TON		\$	
2120	08100		CONCRETE-CLASS A	371.90	CUYD		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2130	08104		CONCRETE-CLASS AA	1,011.10	CUYD		\$	
2140	08130		MECHANICAL REINF COUPLER #5	40.00	EACH		\$	
2150	08133		MECHANICAL REINF COUPLER #8	32.00	EACH		\$	
2160	08137		MECHANICAL REINF COUPLER #14	170.00	EACH		\$	
2170	08140		MECHANICAL REINF COUPLER #5 EPOXY COATED	16.00	EACH		\$	
2180	08141		MECHANICAL REINF COUPLER #6 EPOXY COATED	876.00	EACH		\$	
2190	08150		STEEL REINFORCEMENT	80,001.00	LB		\$	
2200	08151		STEEL REINFORCEMENT-EPOXY COATED	421,346.00	LB		\$	
2210	20392NS835		ELECTRICAL JUNCTION BOX TYPE C	4.00	EACH		\$	
2220	20637ED		DRILLED SHAFT-ROCK 48 IN	55.00	LF		\$	
2230	20745ED		ROCK SOUNDINGS	230.30	LF		\$	
2240	20746ED		ROCK CORINGS	266.00	LF		\$	
2250	21321NC		CSL TESTING (4 TUBES)	14.00	EACH		\$	
2260	22585NN		MICROPILE PROOF TEST	4.00	EACH		\$	
2270	23378EC		CONCRETE SEALING	44,933.00	SQFT		\$	
2280	23583EC		DRILLED SHAFT-48 IN-COMMON	114.00	LF		\$	
2290	23584EC		DRILLED SHAFT-42 IN-ROCK	98.00	LF		\$	
2300	23963EC		PPC I-BEAM TYPE HN 36-49	2,379.70	LF		\$	
2310	24006EC		MICROPILE VERIFICATION TEST	2.00	EACH		\$	
2320	24405EC		MECHANICAL REINF COUPLER-#8 EPOXY COATED	4.00	EACH		\$	
2330	24654ED		SINGLE SLOPE MEDIAN BARRIER	220.00	LF		\$	
2340	25028ED		RAIL SYSTEM SINGLE SLOPE - 40 IN	440.00	LF		\$	
2350	25034ED		MICROPILE BOND ZONE	46.00	EACH		\$	
2360	26209EC		MICROPILES-9 5/8 IN-COMMON	1,158.00	LF		\$	
2370	26210EC		MICROPILES-9 5/8 IN-SOLID ROCK	485.00	LF		\$	

Section: 0006 - RCBC - #28763 - 5'X3' LEESTOWN RD STA 110+18.50

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2380	02403		REMOVE CONCRETE MASONRY	5.70	CUYD		\$	
2390	08003		FOUNDATION PREPARATION	1.00	LS		\$	
2400	08100		CONCRETE-CLASS A	11.10	CUYD		\$	
2410	08150		STEEL REINFORCEMENT	1,470.00	LB		\$	

Section: 0007 - BRIDGE - #28762 - LEESTOWN RD OVER LITTLE COWAN CREEK

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2420	02403		REMOVE CONCRETE MASONRY	9.90	CUYD		\$	
2430	08003		FOUNDATION PREPARATION	1.00	LS		\$	
2440	08100		CONCRETE-CLASS A	19.40	CUYD		\$	
2450	08150		STEEL REINFORCEMENT	2,459.00	LB		\$	

Section: 0008 - SOLDIER PILE RETAINING WALL - #28765 - NEW CIRCLE RD (RAMP C)

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2460	02155		PAVED DITCH TYPE 1 MOD	83.00	SQYD		\$	
2470	08001		STRUCTURE EXCAVATION-COMMON	604.00	CUYD		\$	
2480	08018		RETAINING WALL	2,916.00	SQFT		\$	
2490	08039		PRE-DRILLING FOR PILES	697.00	LF		\$	
2500	21119ED		CONCRETE FORM LINER	303.00	SQYD		\$	
2510	23378EC		CONCRETE SEALING	3,333.00	SQFT		\$	
2520	24375EC		STRUCTURE EXCAVATION-SPECIAL SOLID ROCK	42.00	CUYD		\$	
2530	26129EC		DECORATIVE HANDRAIL	240.00	LF		\$	
2540	26200ED		PILES-STEEL W18 X 97	743.00	LF		\$	

Section: 0009 - SOLDIER PILE RETAINING WALS - #28766 - NEW CIRCLE RD (RAMP G)

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2550	02155		PAVED DITCH TYPE 1 MOD	97.00	SQYD		\$	
2560	08001		STRUCTURE EXCAVATION-COMMON	626.00	CUYD		\$	
2570	08018		RETAINING WALL	3,663.00	SQFT		\$	
2580	08039		PRE-DRILLING FOR PILES	292.00	LF		\$	
2590	08051		PILES-STEEL HP14X89	794.00	LF		\$	
2600	21119ED		CONCRETE FORM LINER	364.00	SQYD		\$	
2610	23378EC		CONCRETE SEALING	4,149.00	SQFT		\$	
2620	24375EC		STRUCTURE EXCAVATION-SPECIAL SOLID ROCK	398.00	CUYD		\$	
2630	26129EC		DECORATIVE HANDRAIL	280.00	LF		\$	

Section: 0010 - SOUTH BARRIER WALLS - #28768 - NEW CIRCLE RD

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2640	08039		PRE-DRILLING FOR PILES	3,863.00	LF		\$	
2650	08050		PILES-STEEL HP14X73	7,999.00	LF		\$	
2660	21590EN		SOUND BARRIER WALL	63,756.00	SQFT		\$	
2670	23378EC		CONCRETE SEALING	129,716.00	SQFT		\$	

Section: 0011 - MSE RETAINING WALL - #28764 - NEW CIRCL RD

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2680	02203		STRUCTURE EXCAV-UNCLASSIFIED	16,438.00	CUYD		\$	
2690	02223		GRANULAR EMBANKMENT	8,737.00	CUYD		\$	
2700	02611		HANDRAIL-TYPE A-1	745.00	LF		\$	
2710	08018		RETAINING WALL	12,851.00	SQFT		\$	

Section: 0012 - UTILITY - COMMUNICATIONS FIBER OPTIC

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2720	04795		CONDUIT-2 IN	9,688.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2730	04820		TRENCHING AND BACKFILLING	9,261.00	LF		\$	
2740	17001		EC COMMUNICATIONS PULL BOX	22.00	EACH		\$	
2750	21543EN		BORE AND JACK CONDUIT	427.00	LF		\$	

Section: 0013 - SEWER

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2760	02690		SAFELOADING	53.40	CUYD		\$	
2770	04871		POLE 35 FT WOODEN	1.00	EACH		\$	
2780	04939		REMOVE POLE	1.00	EACH		\$	
2790	15023		S ENCASEMENT STEEL OPEN CUT RANGE 4	155.00	LF		\$	
2800	15029		S FORCE MAIN AIR RLS/VAC VLV SPCL	1.00	EACH		\$	
2810	15068		S FORCE MAIN SPECIAL 30 INCH PVC	175.00	LF		\$	
2820	15081		S FORCE MAIN TIE-IN SPECIAL 30 INCH	2.00	EACH		\$	
2830	15092		S MANHOLE	18.00	EACH		\$	
2840	15093		S MANHOLE ABANDON/REMOVE	10.00	EACH		\$	
2850	15093		S MANHOLE ABANDON/REMOVE AIR VALVE VAULT	1.00	EACH		\$	
2860	15094		S MANHOLE ADJUST TO GRADE AIR VALVE VAULT	1.00	EACH		\$	
2870	15094		S MANHOLE ADJUST TO GRADE RAISED DURING ROADWAY CONSTRUCTION	2.00	EACH		\$	
2880	15095		S MANHOLE CASTING STANDARD	21.00	EACH		\$	
2890	15099		S MANHOLE TAP EXISTING	2.00	EACH		\$	
2900	15101		S MANHOLE WITH DROP	2.00	EACH		\$	
2910	15104		S PIPE DUCTILE IRON 08 INCH	200.00	LF		\$	
2920	15112		S PIPE PVC 08 INCH	1,250.00	LF		\$	
2930	15114		S PIPE PVC 12 INCH	178.00	LF		\$	
2940	15593		S PIPE SPECIAL INST RECONNECT 8 INCH PVC - PARCEL 38	5.00	LF		\$	

Section: 0014 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2950	04904		BARRIER MOUNTING BRACKET	2.00	EACH		\$	
2960	06400		GMSS GALV STEEL TYPE A	10,747.00	LB		\$	
2970	06405		SBM ALUMINUM PANEL SIGNS	2,957.75	SQFT		\$	
2980	06406		SBM ALUM SHEET SIGNS .080 IN	810.56	SQFT		\$	
2990	06407		SBM ALUM SHEET SIGNS .125 IN	1,398.25	SQFT		\$	
3000	06410		STEEL POST TYPE 1	2,005.00	LF		\$	
3010	06441		GMSS GALV STEEL TYPE C	11,397.00	LB		\$	
3020	06448		SIGN BRIDGE ATTACHMENT BRACKET	2.00	EACH		\$	
3030	06451		REMOVE SIGN SUPPORT BEAM	20.00	EACH		\$	
3040	06490		CLASS A CONCRETE FOR SIGNS	70.00	CUYD		\$	
3050	06491		STEEL REINFORCEMENT FOR SIGNS	3,528.00	LB		\$	
3060	20418ED		REMOVE & RELOCATE SIGNS	3.00	EACH		\$	
3070	20419ND		ROADWAY CROSS SECTION	3.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3080	21373ND		REMOVE SIGN	2.00	EACH		\$	
3090	21596ND		GMSS TYPE D	20.00	EACH		\$	
3100	24631EC		BARCODE SIGN INVENTORY	255.00	EACH		\$	

Section: 0015 - SIGNALIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3110	04811		ELECTRICAL JUNCTION BOX TYPE B	4.00	EACH		\$	
3120	04845		CABLE-NO. 14/7C	23,273.00	LF		\$	
3130	04881		MAST ARM POLE	12.00	EACH		\$	
3140	04886		MESSENGER-15400 LB	1,305.00	LF		\$	
3150	04932		INSTALL STEEL STRAIN POLE	12.00	EACH		\$	
3160	06472		INSTALL SPAN MOUNTED SIGN	30.00	EACH		\$	
3170	20093NS835		INSTALL PEDESTRIAN HEAD-LED	44.00	EACH		\$	
3180	20188NS835		INSTALL LED SIGNAL-3 SECTION	64.00	EACH		\$	
3190	20189NS835		INSTALL LED SIGNAL-5 SECTION	1.00	EACH		\$	
3200	20266ES835		INSTALL LED SIGNAL- 4 SECTION	9.00	EACH		\$	
3210	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	6.00	EACH		\$	
3220	20392NS835		ELECTRICAL JUNCTION BOX TYPE C	4.00	EACH		\$	
3230	20631ND		INSTALL POLE MOUNTED SIGN	13.00	EACH		\$	
3240	21743NN		INSTALL PEDESTRIAN DETECTOR	44.00	EACH		\$	
3250	22631NN		INSTALL MAST ARM POLE	12.00	EACH		\$	
3260	22939ND		INSTALL LUMINAIRE POLE	2.00	EACH		\$	
3270	23157EN		TRAFFIC SIGNAL POLE BASE	112.07	CUYD		\$	
3280	23206EC		INSTALL CONTROLLER CABINET	5.00	EACH		\$	
3290	23235EC		INSTALL PEDESTAL POST	19.00	EACH		\$	
3300	23982EC		INSTALL ANTENNA	5.00	EACH		\$	
3310	24901EC		PVC CONDUIT-2 IN-SCHEDULE 80	1,109.00	LF		\$	
3320	24902EC		PVC CONDUIT-3 IN-SCHEDULE 80	2,444.00	LF		\$	
3330	24908EC		INSTALL SIGNAL CONTROLLER-TY ATC	5.00	EACH		\$	
3340	24937EC		INSTALL EXTERNAL UPS SYSTEM CABINET	1.00	EACH		\$	
3350	24955ED		REMOVE SIGNAL EQUIPMENT	6.00	EACH		\$	
3360	26119EC		INSTALL RADAR PRESENCE DETECTOR TYPE A	32.00	EACH		\$	

Section: 0016 - LIGHTING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3370	01643		JUNCTION BOX-24 IN	34.00	EACH		\$	
3380	04700		POLE 30 FT MTG HT	42.00	EACH		\$	
3390	04701		POLE 40 FT MTG HT	59.00	EACH		\$	
3400	04721		BRACKET 6 FT	8.00	EACH		\$	
3410	04722		BRACKET 8 FT	4.00	EACH		\$	
3420	04723		BRACKET 10 FT	33.00	EACH		\$	
3430	04724		BRACKET 12 FT	8.00	EACH		\$	
3440	04725		BRACKET 15 FT	14.00	EACH		\$	
3450	04740		POLE BASE	90.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3460	04741		POLE BASE IN MEDIAN WALL	34.00	EACH		\$	
3470	04750		TRANSFORMER BASE	67.00	EACH		\$	
3480	04760		POLE W/SECONDARY CONTROL EQUIP	3.00	EACH		\$	
3490	04761		LIGHTING CONTROL EQUIPMENT	2.00	EACH		\$	
3500	04780		FUSED CONNECTOR KIT	140.00	EACH		\$	
3510	04795		CONDUIT-2 IN	2,216.00	LF		\$	
3520	04820		TRENCHING AND BACKFILLING	14,445.00	LF		\$	
3530	04832		WIRE-NO. 12	16,920.00	LF		\$	
3540	04833		WIRE-NO. 8	58,230.00	LF		\$	
3550	04835		WIRE-NO. 4	7,830.00	LF		\$	
3560	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	28.00	EACH		\$	
3570	20392NS835		ELECTRICAL JUNCTION BOX TYPE C	9.00	EACH		\$	
3580	24589ED		LED LUMINAIRE	101.00	EACH		\$	
3590	24900EC		PVC CONDUIT-1 1/4 IN-SCHEDULE 80	12,770.00	LF		\$	

Section: 0017 - MISCELLANEOUS - MARKINGS & STRIPING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3600	06533		PAVE STRIPING REMOVAL-12 IN	1,038.00	LF		\$	
3610	06542		PAVE STRIPING-THERMO-6 IN W	48,036.00	LF		\$	
3620	06543		PAVE STRIPING-THERMO-6 IN Y	26,500.00	LF		\$	
3630	06546		PAVE STRIPING-THERMO-12 IN W	3,757.00	LF		\$	
3640	06547		PAVE STRIPING-THERMO-12 IN Y	53.00	LF		\$	
3650	06566		PAVE MARKING-THERMO X-WALK-12 IN	4,260.00	LF		\$	
3660	06568		PAVE MARKING-THERMO STOP BAR-24IN	1,010.00	LF		\$	
3670	06573		PAVE MARKING-THERMO STR ARROW	53.00	EACH		\$	
3680	06574		PAVE MARKING-THERMO CURV ARROW	78.00	EACH		\$	
3690	06575		PAVE MARKING-THERMO COMB ARROW	18.00	EACH		\$	
3700	06576		PAVE MARKING-THERMO ONLY	5.00	EACH		\$	
3710	20782NS714		PAVE MARKING THERMO-BIKE	25.00	EACH		\$	
3720	21417ES717		PAVE MARK THERMO CONE CAP-SOLID YELLOW	114.00	SQFT		\$	
3730	23871EC		PAVE STRIPE-WET REF TAPE-6 IN Y	394.00	LF		\$	
3740	23872EC		PAVE STRIPE-WET REF TAPE-6 IN W	591.00	LF		\$	
3750	23875NC		REMOVE THERMOPLASTIC ARROWS	3.00	EACH		\$	
3760	24386EC		PAVE MARKING THERMO-BIKE LANE ARROW	25.00	EACH		\$	
3770	24679ED		PAVE MARK THERMO CHEVRON	1,565.00	SQFT		\$	
3780	24683ED		PAVE MARKING-THERMO DOTTED LANE EXTEN	2,111.00	LF		\$	
3790	24689EC		PAVE MARK THERMO-WRONG WAY ARROW	3.00	EACH		\$	
3800	26192EC		PAVE MARKING-THERMO SHARED LANE MARKING	1.00	EACH		\$	

Section: 0018 - TRAFFIC LOOPS (ADDED 10-12-2023)

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3801	04793		CONDUIT-1 1/4 IN	80.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3802	04795		CONDUIT-2 IN	20.00	LF		\$	
3803	04820		TRENCHING AND BACKFILLING	90.00	LF		\$	
3804	04829		PIEZOELECTRIC SENSOR	6.00	EACH		\$	
3805	04830		LOOP WIRE	2,650.00	LF		\$	
3806	04895		LOOP SAW SLOT AND FILL	600.00	LF		\$	
3807	20359NN		GALVANIZED STEEL CABINET	2.00	EACH		\$	
3808	20360ES818		WOOD POST	4.00	EACH		\$	
3809	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	2.00	EACH		\$	

Section: 0019 - TRAINEES

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3810	02742		TRAINEE PAYMENT REIMBURSEMENT GROUP 2, 3, 4 OPERATOR	1,400.00	HOUR		\$	

Section: 0020 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
3820	02568		MOBILIZATION	1.00	LS		\$	
3830	02569		DEMOBILIZATION	1.00	LS		\$	

FAYETTE CO. KY 4 ~m.p. 8.11
 ~LAT/LONG N 38.07479, W 84.51778
 STATION E58

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 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 SPICE-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.

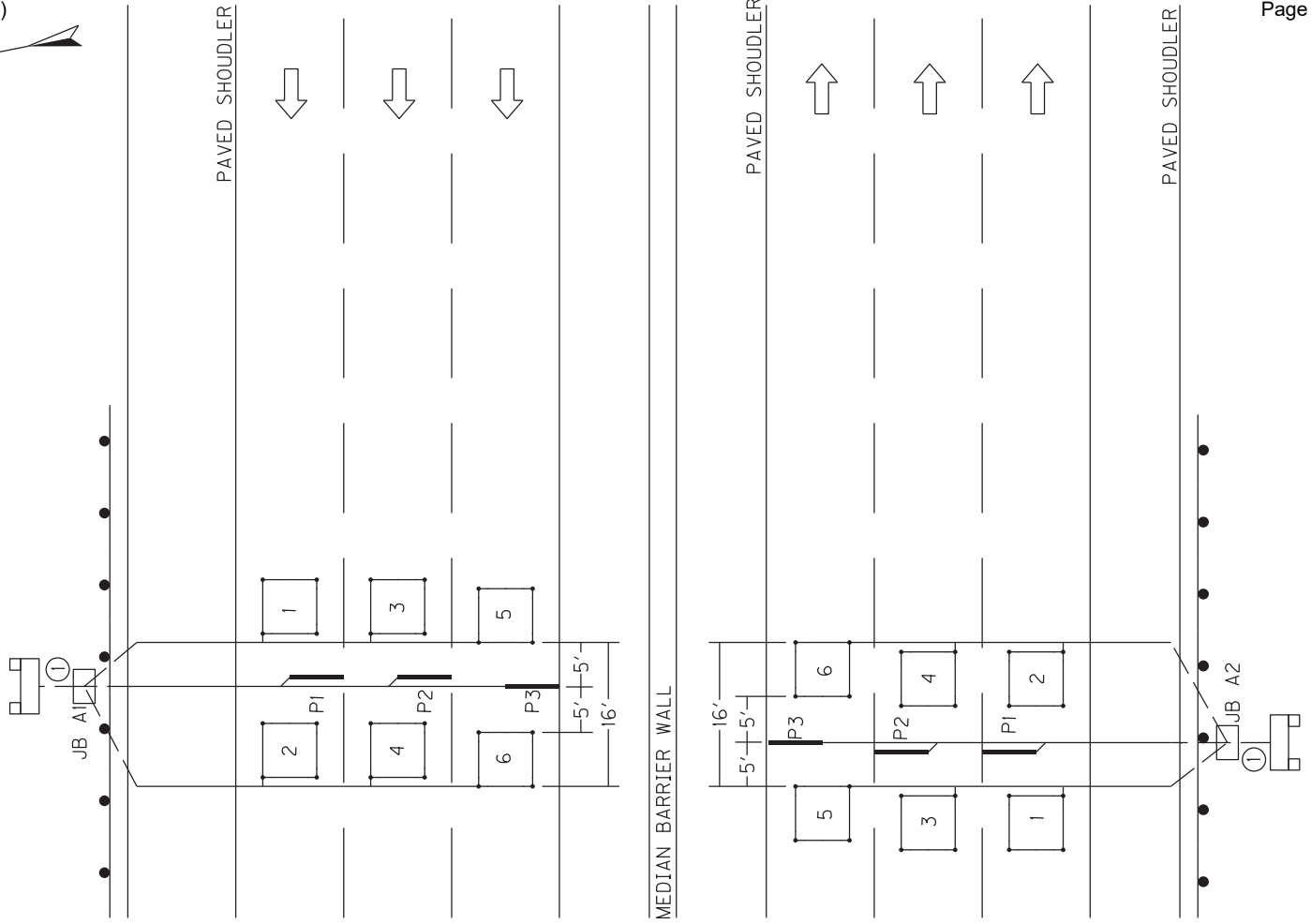
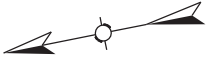
INSTALL ONE (1) 1/4" CONDUIT FROM EACH SAW SLOT TO NEAREST JUNCTION BOX.

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

INSTALL TWO (2) 20"X20"X8" CABINETS MOUNTED TO TWO (2) WOOD POSTS EACH.

CODED NOTE:

① INSTALL ONE (1) 2" CONDUIT.



**PERMANENT TRAFFIC DATA ACQUISITION STATIONS
ESTIMATE OF QUANTITIES**

Bid Item Code	Description	Unit	Quantity
4793	CONDUIT 1 ¼ INCH	LIN FT	80
4795	CONDUIT 2 INCH	LIN FT	20
4811	ELECTRICAL JUNCTION BOX TYPE B	EACH	
4820	TRENCHING AND BACKFILLING	LIN FT	90
4821	OPEN CUT ROADWAY	LIN FT	
4829	PIEZOELECTRIC SENSOR	EACH	6
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	600
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	4
20391NS835	ELECTRICAL JUNCTION BOX TYPE A	EACH	2
20392NS835	ELECTRICAL JUNCTION BOX TYPE C	EACH	
20468EC	ELECTRICAL JUNCTION BOX 10x8x4	EACH	
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 3/4 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. Strandwise for Guy Wire

Strandwise 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 1/2 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 2¹/₈ inch box with ³/₄ inch side and end knockouts and a 1¹/₂ 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 38°F.

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 $\frac{3}{4}$ inch conduit with three 8 AWG service conductors from the cabinet, through the service disconnect to the meter base and a $1\frac{1}{4}$ " 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 $1\frac{3}{4}$ " 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 “¾ 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 “¾ 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 45° 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 1/2 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 ($\pm 1/16$ 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 45° 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 $\pm 20\%$ 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 $\pm 20\%$ 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 signs 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:

<u>Enclosure Type</u>	<u>Additional length of each wire</u>
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

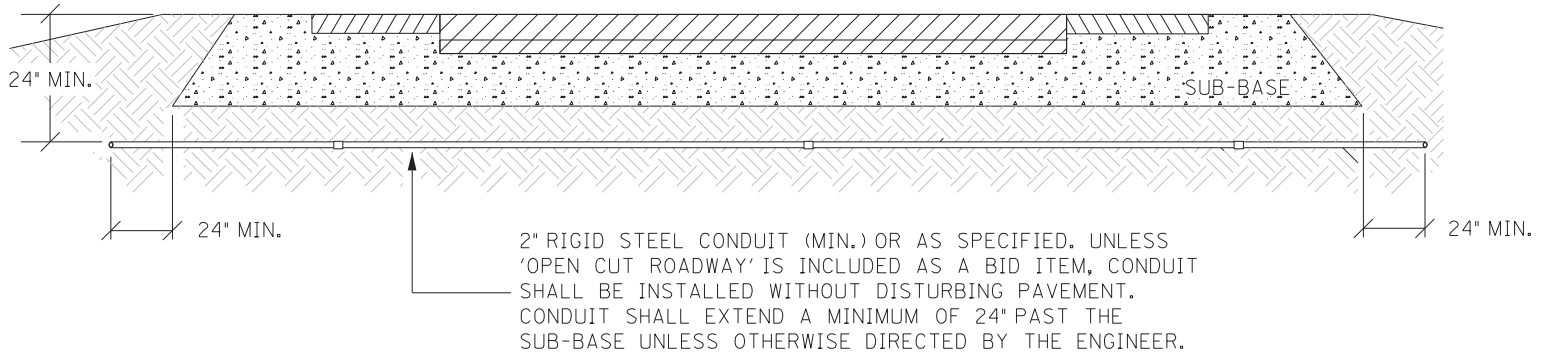
Wood Post shall include furnishing and installing wood post as specified. This item shall include excavation, furnishing and placing concrete (if required), backfilling around the post, and restoration of disturbed areas to the satisfaction of the engineer. Wood Post will be measured in individual units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

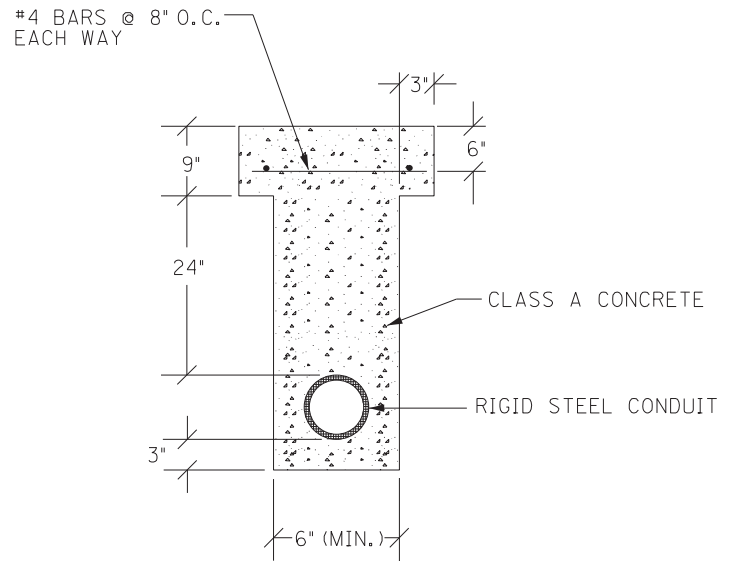
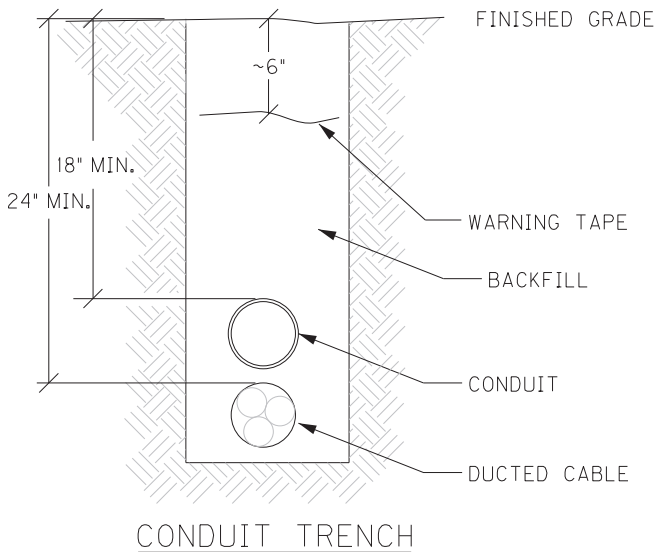


CONDUIT UNDER PAVEMENT

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.

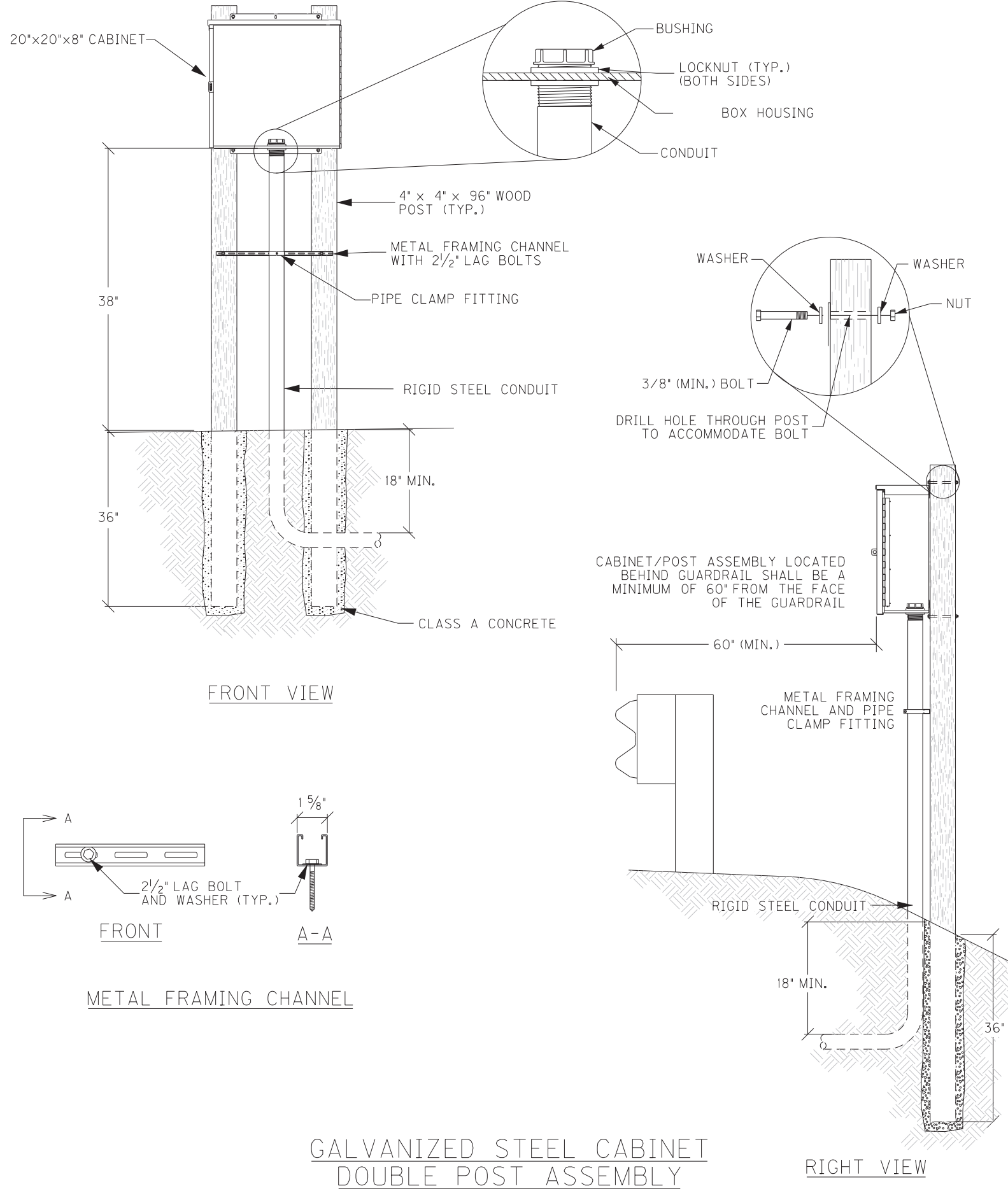
CONTRACTOR SHALL PLACE BACKFILL IN LIFTS (9" MAX.) COMPACT BACKFILL, AND RESTORE DISTURBED AREA TO THE SATISFACTION OF THE ENGINEER

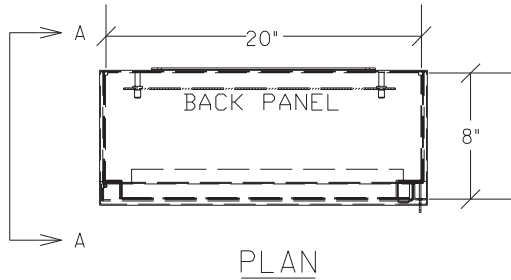
CONTRACTOR SHALL INSTALL UNDERGROUND UTILITY WARNING TAPE ABOVE CONDUIT AS SHOWN.



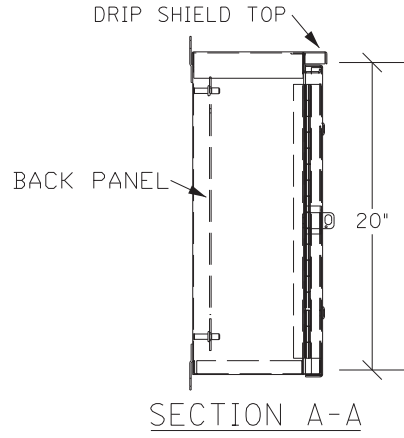
OPEN CUT PAVEMENT DETAIL

CONDUIT INSTALLATION

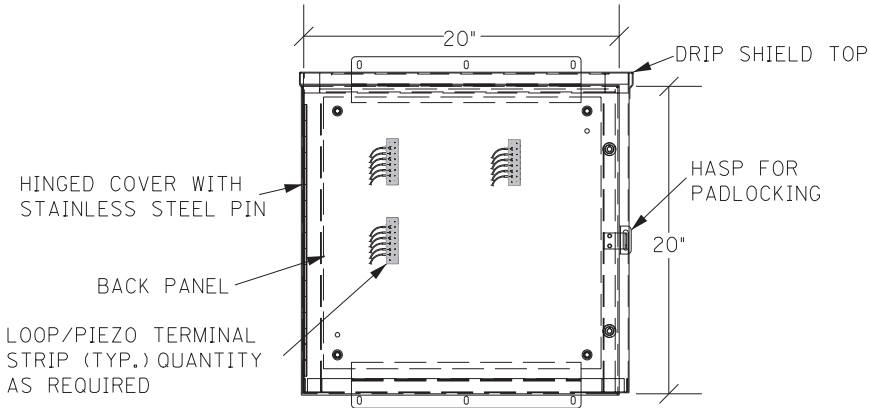




PLAN

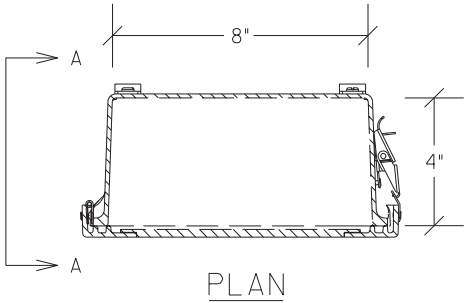


SECTION A-A

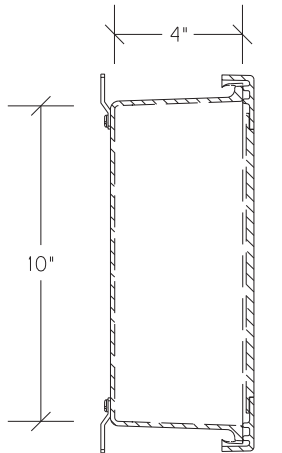


ELEVATION

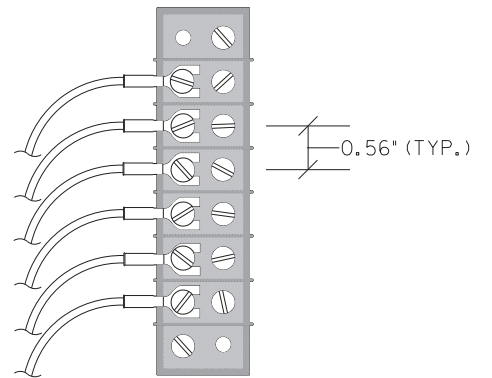
GALVANIZED STEEL CABINET



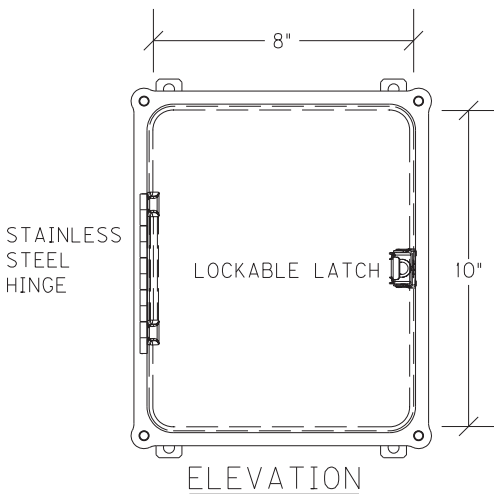
PLAN



SECTION A-A

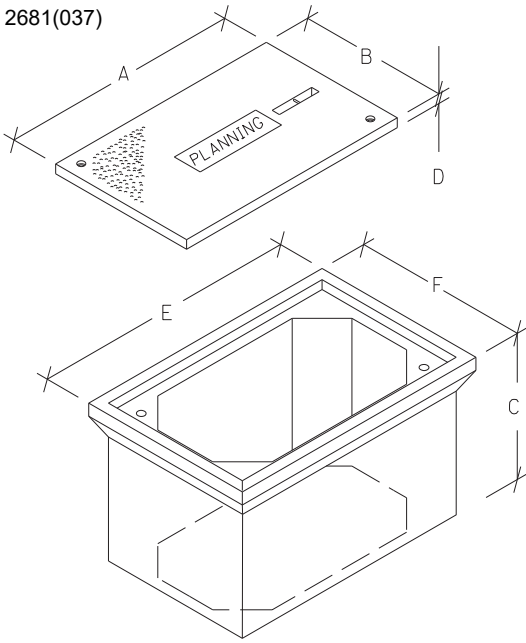


TERMINAL STRIP (TYP.)



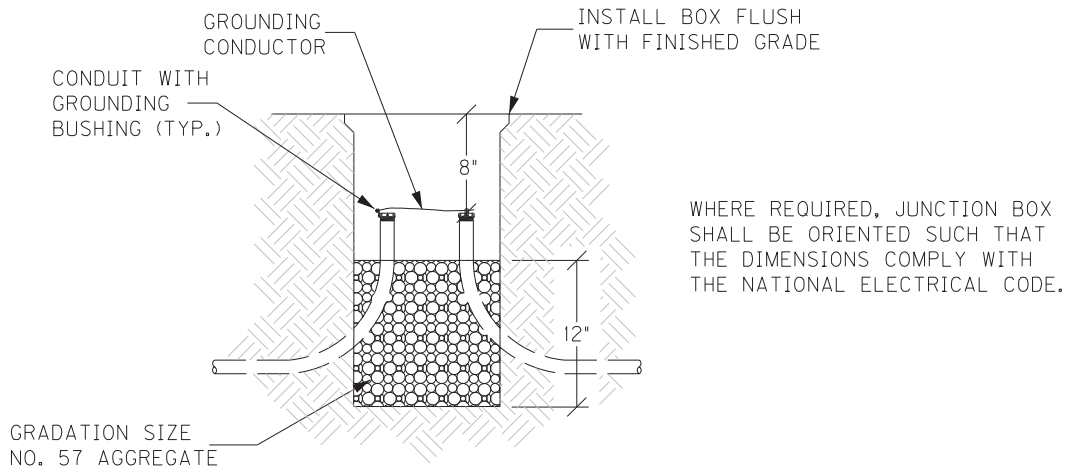
ELEVATION

JUNCTION BOX 10"X8"X4"

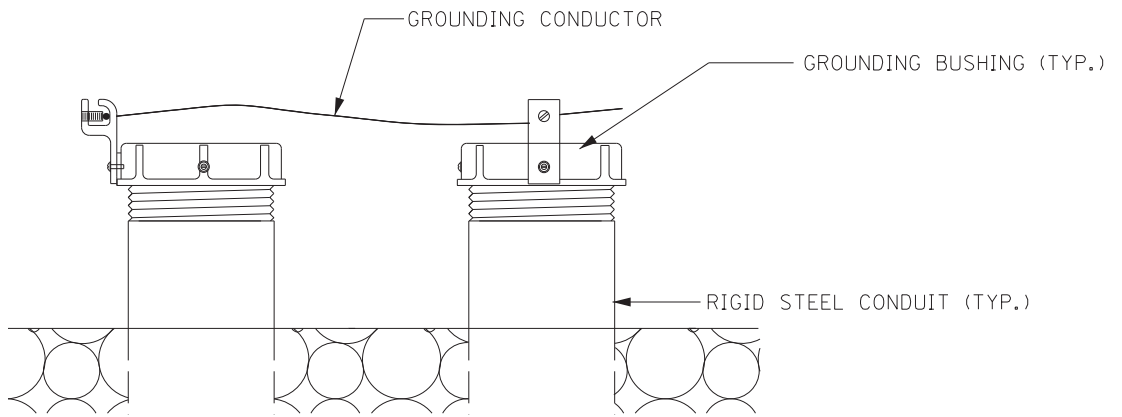


JUNCTION BOX DIMENSIONS (NOMINAL)						
	A	B	C	D*	E	F
TYPE A	23"	14"	18"	2"	25"	16"
TYPE B	18"	11"	12"	1¾"	20"	13"
TYPE C	36"	24"	30"	3"	38"	26"

* MINIMUM
 STACKABLE BOXES ARE PERMITTED



ELEVATION



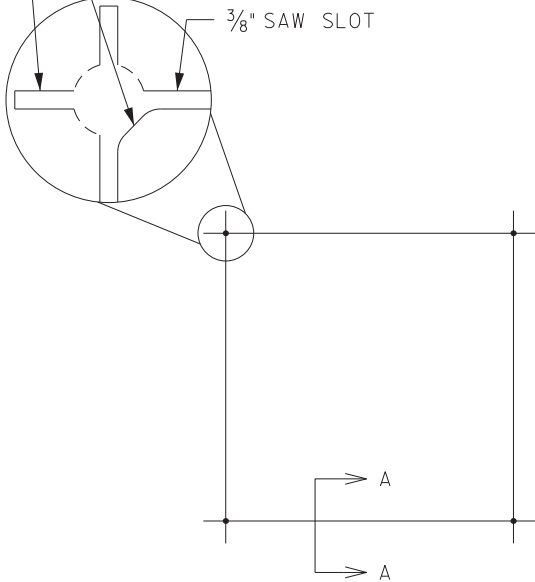
GROUNDING DETAIL

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

JUNCTION BOX - TYPE A, TYPE B, TYPE C

FAYETTE COUNTY
NH 2681(037)

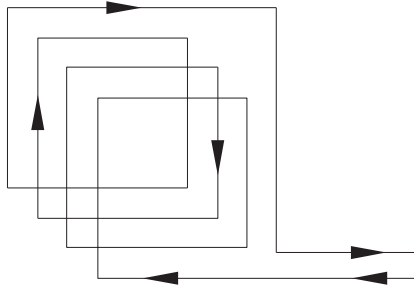
EXTEND CUT BEYOND CORNER
TO ACHIEVE FULL DEPTH
CORE DRILL 1 1/2" HOLE AND/OR
CHISEL CORNER TO SLOT DEPTH
TO ELIMINATE SHARP EDGES



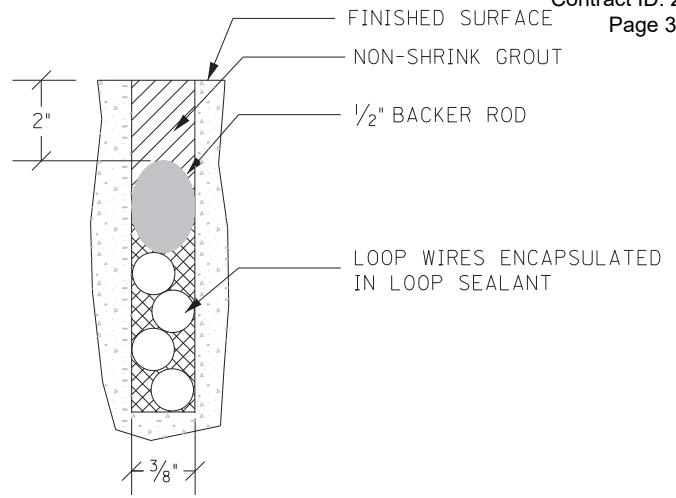
SAW CUT PLAN

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

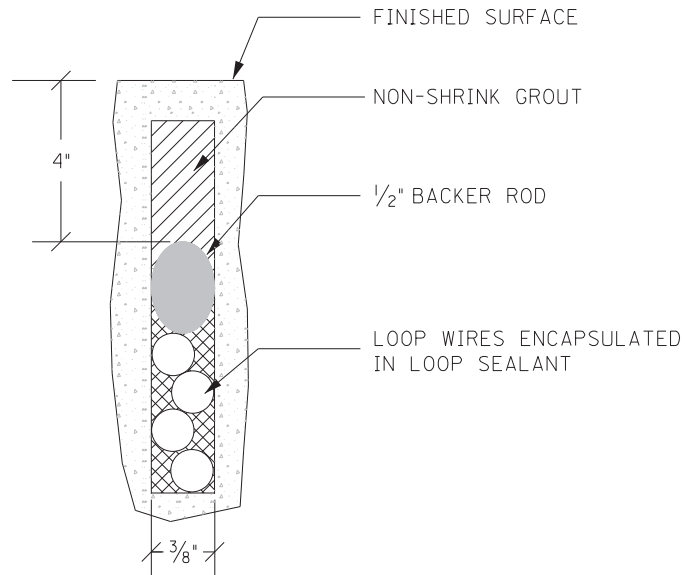
ADJACENT SAW SLOTS SHALL BE A MINIMUM OF 12" APART.



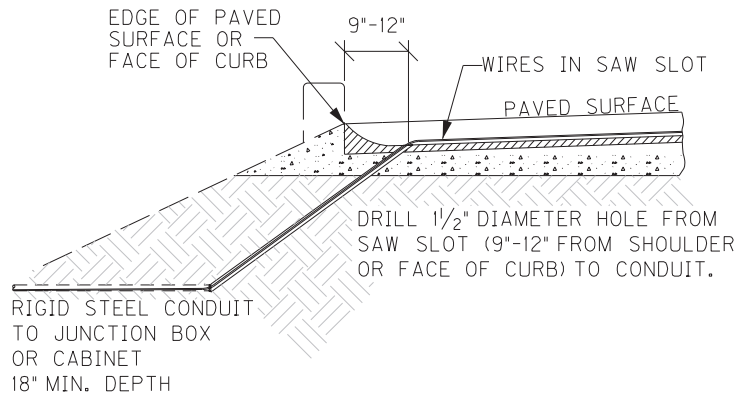
WIRING PLAN



SECTION A-A (CONCRETE)



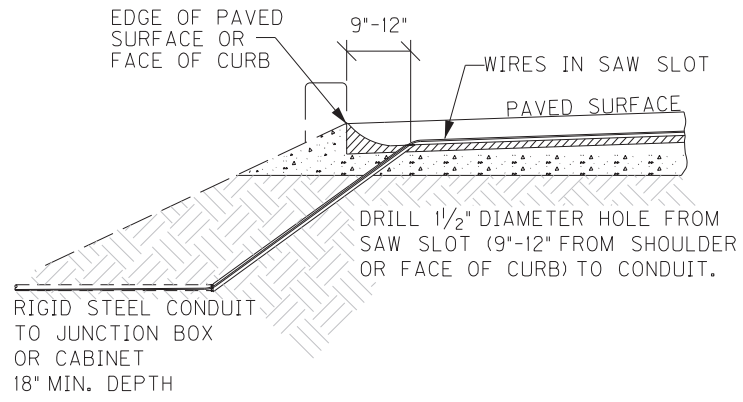
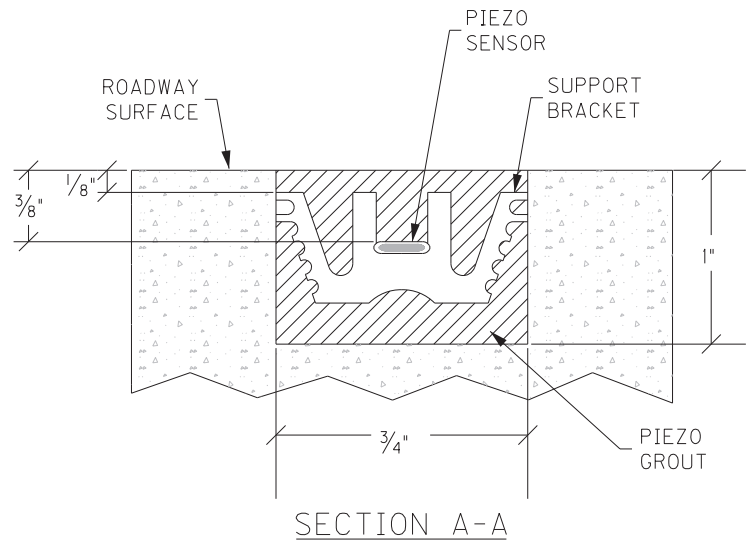
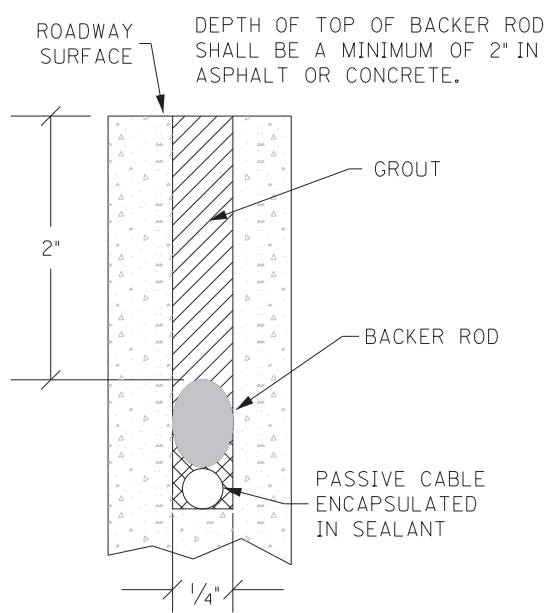
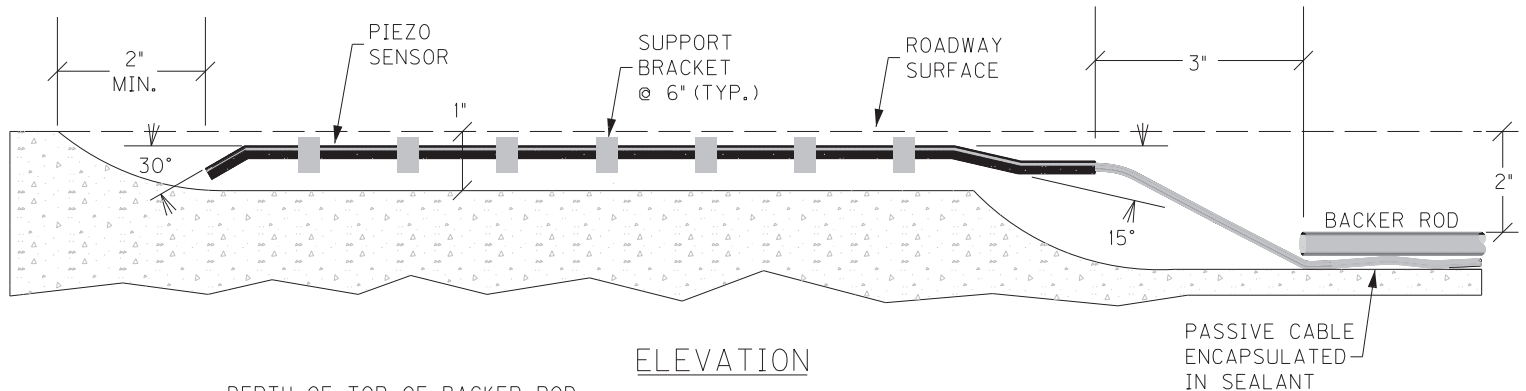
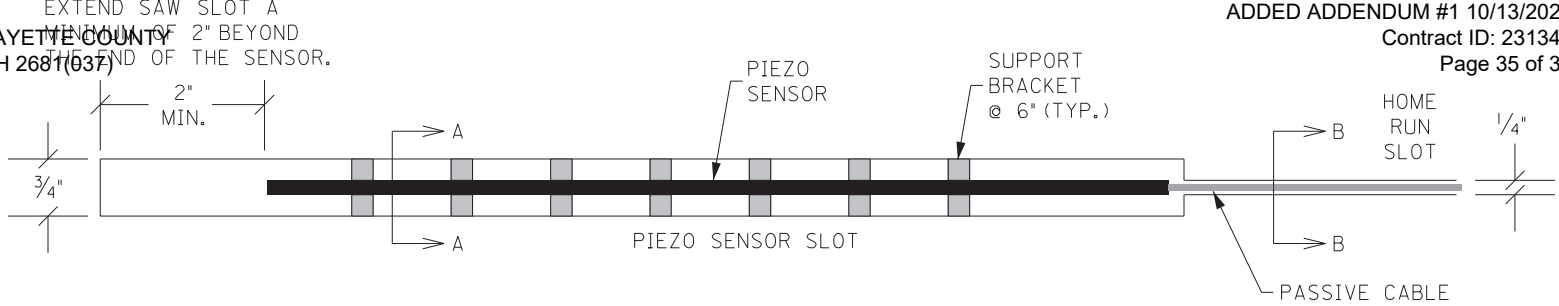
SECTION A-A (ASPHALT)



SAW SLOT EDGE OF PAVEMENT TRANSITION

INDUCTIVE LOOP DETECTOR

FAYETTE COUNTY
NH 2681(037)



SAW SLOT EDGE OF PAVEMENT TRANSITION

PIEZOELECTRIC SENSOR INSTALLATION

GENERAL SUMMARY

ITEM	DESCRIPTION	UNIT	PROJECT TOTALS
0021	DRAINAGE BLANKET - EMBANKMENT ⑮	CU YD	860
0078	CRUSHED AGGREGATE SIZE NO. 2	TON	34
1000	PERFORATED PIPE - 4 IN	LIN FT	17732
1001	PERFORATED PIPE - 6 IN	LIN FT	1874
1010	NON-PERFORATED PIPE - 4 IN	LIN FT	1209
1011	NON-PERFORATED PIPE - 6 IN	LIN FT	104
1015	INSPECT & CERTIFY EDGE DRAIN SYSTEM	LP SUM	1
1020	PERF-PIPE HEADWALL TY 1-4 IN	EACH	5
1028	PERF-PIPE HEADWALL TY 3-4 IN	EACH	23
1032	PERF-PIPE HEADWALL TY 4-4 IN	EACH	6
1310	REMOVE PIPE	LIN FT	2874
1634	CAP CURB BOX INLET	EACH	7
1655	REMOVE JUNCTION BOX	EACH	1
1718	REMOVE INLET	EACH	20
1740	CORED HOLE DRAINAGE BOX CON. - 4 IN	EACH	106
1741	CORED HOLE DRAINAGE BOX CON. - 6 IN	EACH	13
1787	REMOVE MANHOLE	EACH	1
1810	STANDARD CURB AND GUTTER	LIN FT	12980
1825	ISLAND CURB AND GUTTER	LIN FT	1285
1830	STANDARD INTEGRAL CURB AND GUTTER	LIN FT	684
1880	BARRIER HEADER CURB	LIN FT	74
1923	STANDARD BARRIER MEDIAN TYPE 5	SQ YD	629
1982	DELINEATOR FOR GUARDRAIL M/W	EACH	43
1984	DELINEATOR FOR BARRIER WALL - MW	EACH	401
1985	DELINEATOR FOR BARRIER WALL - MY ⑯	EACH	873
2001	CURB TO BARRIER WALL TRANS	EACH	4
2003	RELOCATE TEMP CONC. BARRIER	LIN FT	31080
2006	REMOVE CONCRETE MEDIAN	LIN FT	188
2014	BARRICADE - TYPE III	EACH	27
2159	TEMPORARY DITCH ③	LIN FT	8058
2160	CLEAN TEMP DITCH ③	LIN FT	4029
2165	REMOVE PAVED DITCH	SQ YD	80
2200	ROADWAY EXCAVATION	CU YD	110402
2203	STRUCTURE EXCAVATION UNCLASSIFIED	CU YD	381
2242	WATER ②	M GAL	1526
2262	FENCE - WOVEN WIRE TYPE I	LIN FT	886
2265	REMOVE FENCE	LIN FT	3514
2274	FENCE - 6 FT CHAIN LINK	LIN FT	354
21802EN	GUARDRAIL - STEEL "W" BEAM - SINGLE FACE (7 FT POST)	LIN FT	3423
2363	GUARDRAIL CONNECTOR TO BRIDGE END TY A	EACH	4
2367	GUARDRAIL END TREATMENT TYPE I	EACH	1
2369	GUARDRAIL END TREATMENT TYPE 2A	EACH	3
2381	REMOVE GUARDRAIL	LIN FT	2398
2387	GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	EACH	2
2391	GUARDRAIL END TREATMENT TYPE 4A	EACH	4
2429	RIGHT-OF-WAY MONUMENT TYPE I	EACH	30
2432	WITNESS POST	EACH	30
2483	CHANNEL LINING CLASS II	TON	3275
2484	CHANNEL LINING CLASS III	TON	378
2545	CLEARING AND GRUBBING ①	LP SUM	1
2555	CONCRETE - CLASS B ⑤	CU YD	440
2562	TEMPORARY SIGNS	SQ FT	1715
2568	MOBILIZATION	LP SUM	1
2569	DEMobilIZATION	LP SUM	1
2585	EDGE KEY	LIN FT	107
2603	FABRIC - GEOTEXTILE CLASS 2 ⑮	SQ YD	5345
2607	FABRIC - GEOTEXTILE CLASS 2 FOR PIPE ⑥	SQ YD	29736
2611	HANDRAIL TYPE A-1	LIN FT	850
2625	REMOVE HEADWALL	EACH	32
2650	MAINTAIN & CONTROL TRAFFIC	LP SUM	1
2671	PORTABLE CHANGEABLE MESSAGE SIGN ④	EACH	5
2690	SAFELoADING	CU YD	98
2696	SHOULDER RUMBLE STRIPS - SAWED	LIN FT	27066

ITEM	DESCRIPTION	UNIT	PROJECT TOTALS
2701	TEMPORARY SILT FENCE ③	LIN FT	8058
2703	SILT TRAP TYPE A ③	EACH	73
2704	SILT TRAP TYPE B ③	EACH	73
23862EC	SILT TRAP TYPE B-PERM (MOD.)	EACH	5
2705	SILT TRAP TYPE C ③	EACH	73
2706	CLEAN SILT TRAP TYPE A ③	EACH	73
2707	CLEAN SILT TRAP TYPE B ③	EACH	73
2708	CLEAN SILT TRAP TYPE C ③	EACH	73
2719	SiDEWALK - 4 1/2 INCH CONCRETE	SQ YD	3938
2726	STAKING	LP SUM	1
2731	REMOVE STRUCTURE ⑦	LP SUM	1
2731	REMOVE STRUCTURE ⑧	LP SUM	1
2731	REMOVE STRUCTURE ⑨	LP SUM	1
2731	REMOVE STRUCTURE ⑩	LP SUM	1
2898	RELOCATE CRASH CUSHION	EACH	8
21288ND	CONCRETE MEDIAN BARRIER TYPE I2C2-50 IN	LIN FT	762
3171	CONCRETE BARRIER WALL TYPE 9T ⑫	LIN FT	13740
3262	CLEAN PIPE STRUCTURE	EACH	5
4810	ELECTRICAL JUNCTION BOX ⑬ ⑭	EACH	26
5950	EROSION CONTROL BLANKET ③	SQ YD	7094
5952	TEMPORARY MULCH ③	SQ YD	85765
5953	TEMP SEEDING AND PROTECTION ③	SQ YD	64330
5963	INITIAL FERTILIZER ③	TON	7
5964	MAINTENANCE FERTILIZER ③	TON	4
5985	SEEDING AND PROTECTION ③	SQ YD	128648
5989	SPECIAL SEEDING CROWN VETCH ③	SQ YD	28830
5990	SODDING ③	SQ YD	2594
5992	AGRICULTURAL LIMESTONE ③	TON	80
6401	FLEXIBLE DELINEATOR POST M/W	EACH	216
6404	FLEXIBLE DELINEATOR POST M/Y	EACH	69
6511	PAVE STRIPING - TEMP PAINT - 6 INCH	LIN FT	260100
6610	INLAID PAVEMENT MARKER - MW	EACH	146
6612	INLAID PAVEMENT MARKER - BY	EACH	237
6613	INLAID PAVEMENT MARKER - B W/R	EACH	588
8901	CRASH CUSHION TYPE VI CLASS BT TL2	EACH	7
10020NS	FUEL ADJUSTMENT	DOLLAR	221494
10030NS	ASPHALT ADJUSTMENT	DOLLAR	341652
20099ES842	PAVE MARK TEMP PAINT STOP BAR	LIN FT	747
20100ES842	PAVE MARK TEMP PAINT LINE ARROW	EACH	315
20394ES835	PVC CONDUIT - 3 IN - IN MEDIAN BARRIER WALL ⑬	LIN FT	5666
20411ED	LAW ENFORCEMENT OFFICER ⑭	HOUR	200
20430ED	SAW CUT	LIN FT	12037
20432ES112	REMOVE CRASH CUSHION	EACH	2
21119ED	CONCRETE FORM LINER	SQ YD	343
22664EN	WATER BLASTING EXISTING STRIPE	LIN FT	232050
24814EC	PIPELINE INSPECTION	LIN FT	11828
23158ES505	DETECTABLE WARNINGS	SQ FT	695
23274ENIIF	TURF REINFORCEMENT MAT I	SQ YD	17
23769EC	ROCK FENCE (REMOVE AND REBUILD) ⑳	LIN FT	374
24651ED	CONCRETE ISLAND	SQ YD	11
24654ED	SINGLE SLOPE MEDIAN BARRIER TYPE 14C ⑪	LIN FT	5490
24845EC	UTILITY COORDINATION ⑳	LP SUM	1
24665EX	RAILROAD COORDINATION	LP SUM	1
4793	CONDUIT 1/4 INCH ㉕	LIN FT	80
4795	CONDUIT 2 INCH ㉕	LIN FT	20
4820	TRENCHING AND BACKFILLING ㉕	LIN FT	90
4829	PIEZOELECTRIC SENSOR ㉕	EACH	6
4830	LOOP WIRE ㉕	LIN FT	2650
4895	LOOP SAW SLOT AND FILL ㉕	LIN FT	600
20359NN	GALVANIZED STEEL CABINET ㉕	EACH	2
20360ES818	WOOD POST ㉕	EACH	4
20391NS835	ELECTRICAL JUNCTION BOX TYPE A ㉕	EACH	2

NOTES:

- ① APPROXIMATELY 59 ACRES.
 - ② FOR CONTROLLING DUST CAUSED BY MAINTAINING TRAFFIC ONLY.
 - ③ EROSION CONTROL QUANTITIES ARE BASED ON THE PROBABLE AMOUNT OF EROSION CONTROL FEATURES AS ESTIMATED BY THE DESIGNER.
- EARTHWORK (C.Y.)
- | | |
|---------------|--------|
| COM | 97,038 |
| EMB | 27,700 |
| SURF. DT. LT. | 2,953 |
| SURF. DT. RT. | 1,666 |
| ROCK | 5,887 |
| EMB. BENCH | 2,858 |
| ROCK REFILL | 275 |
- NOTE:
THE EARTHWORK SHOWN ABOVE IS FOR INFORMATION ONLY. ASSUMPTIONS FOR SHRINKAGE AND SWELL FACTORS ARE THE CONTRACTOR'S RESPONSIBILITY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DISPOSE OF ANY WASTE MATERIAL.
- ④ THE SIGNS WILL BECOME PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
 - ⑤ FOR GRAVITY RETAINING WALL.
 - ⑥ FOR WRAPPING PIPE TRENCH BACKFILL.
 - ⑦ STA. 342+07.64 TWIN BRIDGES OVER LEESTOWN RD.
 - ⑧ STA. 385+14.37 TWIN BRIDGES OVER NORFOLK SOUTHERN RAILROAD
 - ⑨ STA. 88+02 LEESTOWN RD DRAINAGE STRUCTURE
 - ⑩ STA. 110+11 LEESTOWN RD DRAINAGE STRUCTURE
 - ⑪ SEE SHEETS R53B AND R53C FOR DETAILS
 - ⑫ TO BECOME PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
 - ⑬ SEE SHEET T70 FOR DETAILS
 - ⑭ SPACING APPROXIMATELY 225'
 - ⑮ TO BE USED IF NEEDED ON THE FOUNDATION EMBANKMENT BENCHES
 - ⑯ 692 EA FOR THE MAINTENANCE OF TRAFFIC TEMP. BARRIER WALL & 181 EA FOR THE PERMANENT MEDIAN BARRIER WALL.
 - ⑰ SEE SHEET T1 FOR SIGNING QUANTITIES
 - ⑱ SEE SHEET T41 FOR PAVEMENT MARKING AND STRIPING SUMMARY
 - ⑲ SEE SHEET T53 FOR SIGNAL QUANTITIES
 - ⑳ SEE UTILITY SHEET U1 FOR THE PROPOSED FIBER OPTIC CONSTRUCTION QUANTITIES
 - ㉑ SEE UTILITY SHEET U13 FOR SANITARY SEWER QUANTITIES
 - ㉒ SEE SPECIAL NOTE FOR DRY LAID ROCK FENCES.
 - ㉓ SEE SPECIAL NOTE FOR UTILITY COORDINATION FOR DETAILS.
 - ㉔ QUANTITY FOR ESTIMATING PURPOSES ONLY
 - ㉕ SEE PROPOSAL FOR DETAILS

GENERAL SUMMARY

FILE NAME: G:\PWORKING\PIIT\1014629\ROOZOMSU.DGN
 USER: JGUJNN
 DATE PLOTTED: October 11, 2023
 E-SHEET NAME:
 MicroStation v8.11.9.919

GENERAL SUMMARY

ITEM	DESCRIPTION	UNIT	PROJECT TOTALS
0021	DRAINAGE BLANKET - EMBANKMENT ⑮	CU YD	860
0078	CRUSHED AGGREGATE SIZE NO. 2	TON	34
1000	PERFORATED PIPE - 4 IN	LIN FT	17732
1001	PERFORATED PIPE - 6 IN	LIN FT	1874
1010	NON-PERFORATED PIPE - 4 IN	LIN FT	1209
1011	NON-PERFORATED PIPE - 6 IN	LIN FT	104
1015	INSPECT & CERTIFY EDGE DRAIN SYSTEM	LP SUM	1
1020	PERF-PIPE HEADWALL TY 1-4 IN	EACH	5
1028	PERF-PIPE HEADWALL TY 3-4 IN	EACH	23
1032	PERF-PIPE HEADWALL TY 4-4 IN	EACH	6
1310	REMOVE PIPE	LIN FT	2874
1634	CAP CURB BOX INLET	EACH	7
1655	REMOVE JUNCTION BOX	EACH	1
1718	REMOVE INLET	EACH	20
1740	CORED HOLE DRAINAGE BOX CON. - 4 IN	EACH	106
1741	CORED HOLE DRAINAGE BOX CON. - 6 IN	EACH	13
1787	REMOVE MANHOLE	EACH	1
1810	STANDARD CURB AND GUTTER	LIN FT	12980
1825	ISLAND CURB AND GUTTER	LIN FT	1285
1830	STANDARD INTEGRAL CURB AND GUTTER	LIN FT	684
1880	BARRIER HEADER CURB	LIN FT	74
1923	STANDARD BARRIER MEDIAN TYPE 5	SQ YD	629
1982	DELINEATOR FOR GUARDRAIL M/W	EACH	43
1984	DELINEATOR FOR BARRIER WALL - MW	EACH	401
1985	DELINEATOR FOR BARRIER WALL - MY ⑯	EACH	873
2001	CURB TO BARRIER WALL TRANS	EACH	4
2003	RELOCATE TEMP CONC. BARRIER	LIN FT	31080
2006	REMOVE CONCRETE MEDIAN	LIN FT	188
2014	BARRICADE - TYPE III	EACH	27
2159	TEMPORARY DITCH ③	LIN FT	8058
2160	CLEAN TEMP DITCH ③	LIN FT	4029
2165	REMOVE PAVED DITCH	SQ YD	80
2200	ROADWAY EXCAVATION	CU YD	110402
2203	STRUCTURE EXCAVATION UNCLASSIFIED	CU YD	381
2242	WATER ②	M GAL	1526
2262	FENCE - WOVEN WIRE TYPE I	LIN FT	886
2265	REMOVE FENCE	LIN FT	3514
2274	FENCE - 6 FT CHAIN LINK	LIN FT	354
21802EN	GUARDRAIL - STEEL "W" BEAM - SINGLE FACE (7 FT POST)	LIN FT	3423
2363	GUARDRAIL CONNECTOR TO BRIDGE END TY A	EACH	4
2367	GUARDRAIL END TREATMENT TYPE I	EACH	1
2369	GUARDRAIL END TREATMENT TYPE 2A	EACH	3
2381	REMOVE GUARDRAIL	LIN FT	2398
2387	GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	EACH	2
2391	GUARDRAIL END TREATMENT TYPE 4A	EACH	4
2429	RIGHT-OF-WAY MONUMENT TYPE I	EACH	30
2432	WITNESS POST	EACH	30
2483	CHANNEL LINING CLASS II	TON	3275
2484	CHANNEL LINING CLASS III	TON	378
2545	CLEARING AND GRUBBING ①	LP SUM	1
2555	CONCRETE - CLASS B ⑤	CU YD	440
2562	TEMPORARY SIGNS	SQ FT	1715
2568	MOBILIZATION	LP SUM	1
2569	DEMobilIZATION	LP SUM	1
2585	EDGE KEY	LIN FT	107
2603	FABRIC - GEOTEXTILE CLASS 2 ⑮	SQ YD	5345
2607	FABRIC - GEOTEXTILE CLASS 2 FOR PIPE ⑥	SQ YD	29736
2611	HANDRAIL TYPE A-1	LIN FT	850
2625	REMOVE HEADWALL	EACH	32
2650	MAINTAIN & CONTROL TRAFFIC	LP SUM	1
2671	PORTABLE CHANGEABLE MESSAGE SIGN ④	EACH	5
2690	SAFELoADING	CU YD	98
2696	SHOULDER RUMBLE STRIPS - SAWED	LIN FT	27066

ITEM	DESCRIPTION	UNIT	PROJECT TOTALS
2701	TEMPORARY SILT FENCE ③	LIN FT	8058
2703	SILT TRAP TYPE A ③	EACH	73
2704	SILT TRAP TYPE B ③	EACH	73
23862EC	SILT TRAP TYPE B-PERM (MOD.)	EACH	5
2705	SILT TRAP TYPE C ③	EACH	73
2706	CLEAN SILT TRAP TYPE A ③	EACH	73
2707	CLEAN SILT TRAP TYPE B ③	EACH	73
2708	CLEAN SILT TRAP TYPE C ③	EACH	73
2719	SiDEWALK - 4 1/2 INCH CONCRETE	SQ YD	3938
2726	STAKING	LP SUM	1
2731	REMOVE STRUCTURE ⑦	LP SUM	1
2731	REMOVE STRUCTURE ⑧	LP SUM	1
2731	REMOVE STRUCTURE ⑨	LP SUM	1
2731	REMOVE STRUCTURE ⑩	LP SUM	1
2898	RELOCATE CRASH CUSHION	EACH	8
21288ND	CONCRETE MEDIAN BARRIER TYPE I2C2-50 IN	LIN FT	762
3171	CONCRETE BARRIER WALL TYPE 9T ⑫	LIN FT	13740
3262	CLEAN PIPE STRUCTURE	EACH	5
4810	ELECTRICAL JUNCTION BOX ⑬ ⑭	EACH	26
5950	EROSION CONTROL BLANKET ③	SQ YD	7094
5952	TEMPORARY MULCH ③	SQ YD	85765
5953	TEMP SEEDING AND PROTECTION ③	SQ YD	64330
5963	INITIAL FERTILIZER ③	TON	7
5964	MAINTENANCE FERTILIZER ③	TON	4
5985	SEEDING AND PROTECTION ③	SQ YD	128648
5989	SPECIAL SEEDING CROWN VETCH ③	SQ YD	28830
5990	SODDING ③	SQ YD	2594
5992	AGRICULTURAL LIMESTONE ③	TON	80
6401	FLEXIBLE DELINEATOR POST M/W	EACH	216
6404	FLEXIBLE DELINEATOR POST M/Y	EACH	69
6511	PAVE STRIPING - TEMP PAINT - 6 INCH	LIN FT	260100
6610	INLAID PAVEMENT MARKER - MW	EACH	146
6612	INLAID PAVEMENT MARKER - BY	EACH	237
6613	INLAID PAVEMENT MARKER - B W/R	EACH	588
8901	CRASH CUSHION TYPE VI CLASS BT TL2	EACH	7
10020NS	FUEL ADJUSTMENT	DOLLAR	221494
10030NS	ASPHALT ADJUSTMENT	DOLLAR	341652
20099ES842	PAVE MARK TEMP PAINT STOP BAR	LIN FT	747
20100ES842	PAVE MARK TEMP PAINT LINE ARROW	EACH	315
20394ES835	PVC CONDUIT - 3 IN - IN MEDIAN BARRIER WALL ⑮ ⑲	LIN FT	5666
20411ED	LAW ENFORCEMENT OFFICER ⑲	HOUR	200
20430ED	SAW CUT	LIN FT	12037
20432ES112	REMOVE CRASH CUSHION	EACH	2
21119ED	CONCRETE FORM LINER	SQ YD	343
22664EN	WATER BLASTING EXISTING STRIPE	LIN FT	232050
24814EC	PIPELINE INSPECTION	LIN FT	11828
23158ES505	DETECTABLE WARNINGS	SQ FT	695
23274ENIIF	TURF REINFORCEMENT MAT I	SQ YD	17
23769EC	ROCK FENCE (REMOVE AND REBUILD) ⑳	LIN FT	374
24651ED	CONCRETE ISLAND	SQ YD	11
24654ED	SINGLE SLOPE MEDIAN BARRIER TYPE 14C ⑪	LIN FT	5490
24845EC	UTILITY COORDINATION ⑳	LP SUM	1
24665EX	RAILROAD COORDINATION	LP SUM	1
4793	CONDUIT 1/4 INCH ⑳	LIN FT	80
4795	CONDUIT 2 INCH ⑳	LIN FT	20
4820	TRENCHING AND BACKFILLING ⑳	LIN FT	90
4829	PIEZOELECTRIC SENSOR ⑳	EACH	6
4830	LOOP WIRE ⑳	LIN FT	2650
4895	LOOP SAW SLOT AND FILL ⑳	LIN FT	600
20359NN	GALVANIZED STEEL CABINET ⑳	EACH	2
20360ES818	WOOD POST ⑳	EACH	4
20391NS835	ELECTRICAL JUNCTION BOX TYPE A ⑳	EACH	2

NOTES:

- ① APPROXIMATELY 59 ACRES.
 - ② FOR CONTROLLING DUST CAUSED BY MAINTAINING TRAFFIC ONLY.
 - ③ EROSION CONTROL QUANTITIES ARE BASED ON THE PROBABLE AMOUNT OF EROSION CONTROL FEATURES AS ESTIMATED BY THE DESIGNER.
- EARTHWORK (C.Y.)
- | | |
|---------------|--------|
| COM | 97,038 |
| EMB | 27,700 |
| SURF. DT. LT. | 2,953 |
| SURF. DT. RT. | 1,666 |
| ROCK | 5,887 |
| EMB. BENCH | 2,858 |
| ROCK REFILL | 275 |
- NOTE:
THE EARTHWORK SHOWN ABOVE IS FOR INFORMATION ONLY. ASSUMPTIONS FOR SHRINKAGE AND SWELL FACTORS ARE THE CONTRACTOR'S RESPONSIBILITY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DISPOSE OF ANY WASTE MATERIAL.
- ④ THE SIGNS WILL BECOME PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
 - ⑤ FOR GRAVITY RETAINING WALL.
 - ⑥ FOR WRAPPING PIPE TRENCH BACKFILL.
 - ⑦ STA. 342+07.64 TWIN BRIDGES OVER LEESTOWN RD.
 - ⑧ STA. 385+14.37 TWIN BRIDGES OVER NORFOLK SOUTHERN RAILROAD
 - ⑨ STA. 88+02 LEESTOWN RD DRAINAGE STRUCTURE
 - ⑩ STA. 110+11 LEESTOWN RD DRAINAGE STRUCTURE
 - ⑪ SEE SHEETS R53B AND R53C FOR DETAILS
 - ⑫ TO BECOME PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
 - ⑬ SEE SHEET T70 FOR DETAILS
 - ⑭ SPACING APPROXIMATELY 225'
 - ⑮ TO BE USED IF NEEDED ON THE FOUNDATION EMBANKMENT BENCHES
 - ⑯ 692 EA FOR THE MAINTENANCE OF TRAFFIC TEMP. BARRIER WALL & 181 EA FOR THE PERMANENT MEDIAN BARRIER WALL.
 - ⑰ SEE SHEET T1 FOR SIGNING QUANTITIES
 - ⑱ SEE SHEET T41 FOR PAVEMENT MARKING AND STRIPING SUMMARY
 - ⑲ SEE SHEET T53 FOR SIGNAL QUANTITIES
 - ⑳ SEE UTILITY SHEET U1 FOR THE PROPOSED FIBER OPTIC CONSTRUCTION QUANTITIES
 - ㉑ SEE UTILITY SHEET U13 FOR SANITARY SEWER QUANTITIES
 - ㉒ SEE SPECIAL NOTE FOR DRY LAID ROCK FENCES.
 - ㉓ SEE SPECIAL NOTE FOR UTILITY COORDINATION FOR DETAILS.
 - ㉔ QUANTITY FOR ESTIMATING PURPOSES ONLY
 - ㉕ SEE PROPOSAL FOR DETAILS

GENERAL SUMMARY

FILE NAME: G:\PWORKING\PIIT\1014629\ROOZOMSU.DGN
 USER: JGJUN
 DATE PLOTTED: October 11, 2023
 E-SHEET NAME:
 MicroStation v8.11.9.919